

Host Controller Interface (HCI)

Bluetooth® Test Suite

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1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth HCI layer with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.

2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [1] and [3].

- [1] Specification of the Bluetooth System, Volume 4¹, Part E, Version 1.2 or later
- [2] Implementation Conformance Statement (ICS) for Host Controller Interface (HCI)
- [3] Test Strategy and Terminology Overview
- [4] Bluetooth Test Suite for Baseband, Version 1.2 or later
- [5] Bluetooth Test Suite for Link Manager, Version 1.2 or later
- [6] Bluetooth Test Suite for 802.11 PAL, Version 3.0 + HS or later
- [7] Bluetooth Test Suite for Link Layer, Version 4.0 or later
- [8] Specification of the Bluetooth System, Core Package, Volume 4¹, Part E, Host Controller Interface (HCI), Version 4.2 or later
- [9] Specification of the Bluetooth System, Core Package, Volume 4¹, Part E, Host Controller Interface (HCI), Version 5.0 or later
- [10] Erratum 10734: Pairing Updates
- [11] Specification of the Bluetooth System, Core Package, Volume 4¹, Part E, Host Controller Interface (HCI), Version 5.1 or later
- [12] Specification of the Bluetooth System, Core Package, Volume 4¹, Part E, Host Controller Interface (HCI), Version 5.2 or later
- [13] Specification of the Bluetooth System, Core Package, Volume 4¹, Part E, Host Controller Interface (HCI), Version 5.3 or later
- [14] Bluetooth Test Suite for Link Layer, Version LL.TS.p18 or later
- [15] Bluetooth Test Suite for Link Layer, Version LL.TS.p17 or later
- [16] [Appropriate Language Mapping Tables](#) document
- [17] Specification of the Bluetooth System, Core Package, Volume 4, Part E, Host Controller Interface (HCI), Version 5.4 or later
- [18] Specification of the Bluetooth System, Volume 6, Part B (Link Layer Protocol Specification), Version 6.0 or later
- [19] Specification of the Bluetooth System, Core Package, Volume 4, Part E, Host Controller Interface (HCI), Version 6.0 or later
- [20] Implementation Conformance Statement (ICS) for Link Layer (LL)

¹ In versions 1.2 to 5.1, *Volume 4, Part E* was *Volume 2, Part E*.

- [21] Specification of the Bluetooth System, Core Package, Volume 2, Part C, Link Manager Protocol (LMP), Version 4.2 or later
- [22] Bluetooth Core Specification Volume 4, Part E, Host Controller Interface (HCI), Version 6.1 or later
- [23] Bluetooth Core Specification Volume 4, Part E, Host Controller Interface (HCI), Version 6.2 or later
- [24] Specification of the Bluetooth System, Volume 6, Part B (Link Layer Protocol Specification), Version 6.2 or later
- [25] Specification of the Bluetooth System, Core Package, Volume 4, Part E, Host Controller Interface (HCI), Version 6.3 or later

2.2 Definitions

In this Bluetooth document, the definitions from [1] and [3] apply.

Certain terms that were identified as inappropriate have been replaced. For a list of the original terms and their replacement terms, see the Appropriate Language Mapping Tables document [16].

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1] and [3] apply.

3 Test Suite Structure (TSS)

3.1 Test Strategy

HCI is the interface between the upper and lower layers of the Bluetooth protocol stack.

The objective of HCI testing is to ensure interoperability and functionality between a Bluetooth Host and a Bluetooth Controller in order to enable qualification and combination of Controller and Host designs. The test cases cover mandatory and optional requirements in the protocol specification, matching these to the supported IUT features described in the Implementation Conformance Statement [2].

Conformance testing is the appropriate test method to meet this intent. The conformance test equipment provides a Lower and Upper Tester implementation.

HCI is being exercised extensively as the test controller (i.e., the Upper Tester) during the Link Layer and Link Manager conformance tests; many HCI commands and events are therefore implicitly proven already within these conformance tests.

HCI specifies the following groups of commands:

- Device Setup
- Controller Flow Control
- Controller Information
- Device Discovery
- Host Flow Control
- Authentication and Encryption
- Controller Configuration
- Controller Setup
- Connectionless Peripheral Broadcast
- LE Connection Management
- LE Power Control
- Isochronous Streams
- SCO and eSCO Connections

Figure 3.1 shows the HCI Test Suite Structure (TSS) including its subgroups defined for the conformance testing.

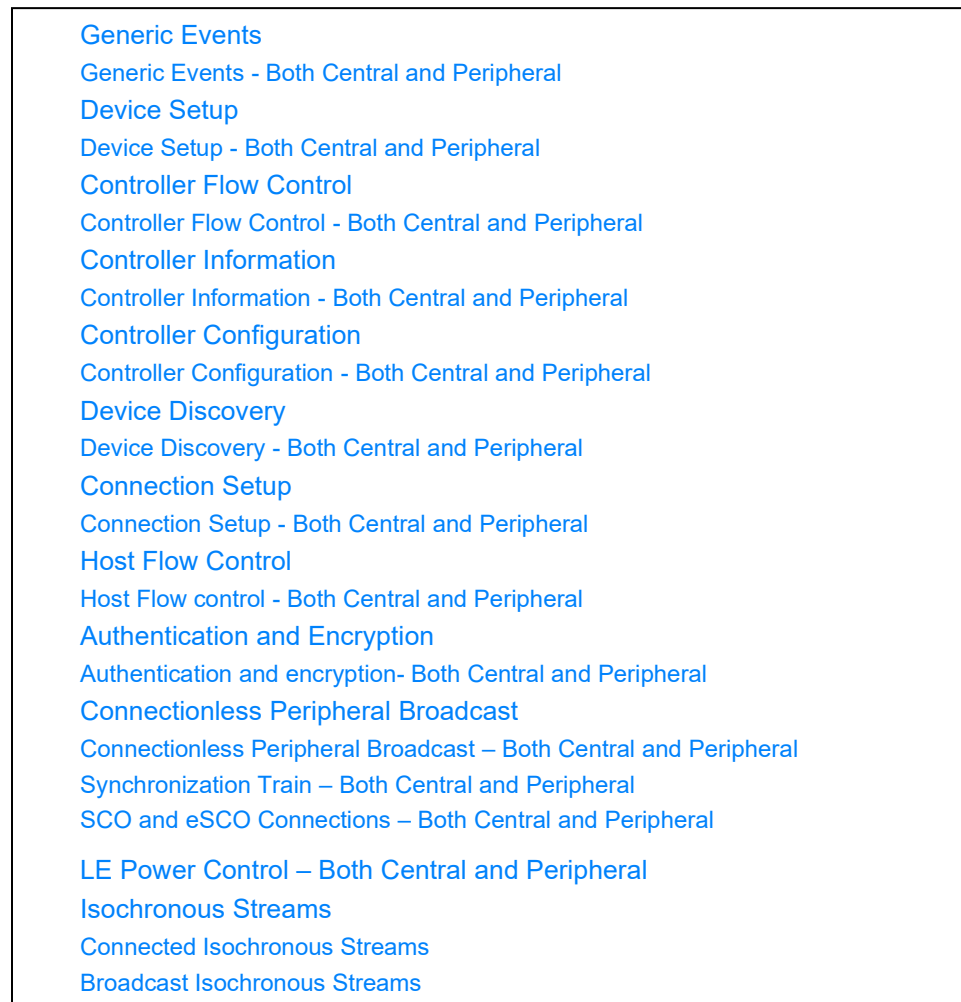


Figure 3.1: TSS for HCI

3.2 Test groups

The test groups are organized in three levels. The first level defines the protocol groups representing the protocol services. The second level separates the protocol services in functional modules. The last level in each branch contains the standard ISO subgroups BV and BI.

3.2.1 Main test groups

The following test groups have been defined.

3.2.1.1 Generic Events

This generic events group covers the IUT response to commands not supported by the IUT or disallowed after receiving the first legacy or extended advertising command.

3.2.1.2 Device Setup

The device setup group of commands is used to place the Controller into a known state.

3.2.1.3 Controller Flow Control

The controller flow control group of commands and events are used to control data flow from the Host to the Controller.

3.2.1.4 Controller Information

The controller information group of commands allows the Host to discover local information about the device.

3.2.1.5 Device Discovery

The device discovery group of commands and events allows a device to discover other devices in the surrounding area. On LE this group of commands is also used to control advertising and scanning functionalities on the LL.

3.2.1.6 Host Flow Control

The Host flow control group of commands and events allows flow control to be used towards the Host.

3.2.1.7 Authentication and Encryption

The authentication and encryption group of commands and events allows authentication of a remote device and then encryption of the link to one or more remote devices.

3.2.1.8 Controller Configuration

The controller configuration group of commands and events allows the global configuration parameters to be configured.

3.2.1.9 Controller Setup

The controller setup group of commands and events are used to allow a device to make a connection to another device.

3.2.1.10 Connectionless Peripheral Broadcast

The Connectionless Peripheral Broadcast group of commands and events allows use of the CPB logical link to broadcast data to an unlimited number of recipients.

3.2.1.11 LE Power Control

The LE Power Control group of commands and events allows a device to query the controller's current and maximum transmit power levels.

3.2.1.12 Isochronous Streams

The Isochronous Streams group of commands and events allows use of Connected Isochronous Streams and Broadcast Isochronous Streams.

3.2.1.13 SCO and eSCO Connections

The SCO and eSCO Connections group of commands allow the creation, acceptance, and termination of SCO and eSCO Connections.

3.2.1.14 Event Versioning

The Event Versioning group of commands verifies that the controller sends the proper version of events that have multiple versions.

3.2.2 Behavior test groups

3.2.2.1 Valid Behavior (BV) tests

This subgroup provides testing to verify that the IUT reacts in conformity with the Bluetooth standard, after receipt or exchange of valid HCI messages. Valid PDUs means that the exchange of messages and the content of the exchanged messages are considered as valid.

3.2.2.2 Invalid Behavior (BI) tests

This subgroup provides testing to verify that the IUT reacts in conformity with the Bluetooth standard, after receipt of a syntactically or semantically invalid HCI message.

3.3 HCI command and event version

If a command or event has more than one version and the test does not explicitly say otherwise:

- A reference to a command specifying the version number means that that version or any higher-numbered version supported by the IUT may be used.
- A reference to an event specifying the version number means that that version or at least one higher-numbered version supported by the IUT is unmasked (other versions, including lower-numbered versions, may also be unmasked).
- A reference to a command or event that does not specify the version number is equivalent to specifying [v1].

4 Test cases

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [3]. The convention used here is: **<spec abbreviation>/<IUT role>/<class>/<feat>/<func>/<subfunc>/<cap>/<xx>-<nn>-<y>**.

Additional definitions and abbreviations can be found in [1].

Identifier Abbreviation	Spec Identifier <spec abbreviation>
HCI	Host Controller Interface
Identifier Abbreviation	Feature Identifier <feat>
AEN	Authentication and Encryption
BIS	Broadcast Isochronous Stream
CCO	Controller Configuration
CFC	Controller Flow Control
CIN	Controller Information
CIS	Connected Isochronous Stream
CM	LE Connection Management
CPB	Connectionless Peripheral Broadcast
CSE	Controller Setup
DDI	Device Discovery
DSU	Device Setup
EVV	Event Versioning
GEV	Generic Events
HFC	Host Flow Control
PCL	LE Power Control
SCO	SCO and eSCO Connections

Table 4.1: HCI TC feature naming conventions

4.1.2 Conformance

When conformance is claimed for a particular specification, all capabilities are to be supported in the specified manner. The mandated tests from this Test Suite depend on the capabilities to which conformance is claimed.

The Bluetooth Qualification Program may employ tests to verify implementation robustness. The level of implementation robustness that is verified varies from one specification to another and may be revised for cause based on interoperability issues found in the market.

Such tests may verify:

- That claimed capabilities may be used in any order and any number of repetitions not excluded by the specification
- That capabilities enabled by the implementations are sustained over durations expected by the use case

- That the implementation gracefully handles any quantity of data expected by the use case
- That in cases where more than one valid interpretation of the specification exists, the implementation complies with at least one interpretation and gracefully handles other interpretations
- That the implementation is immune to attempted security exploits

A single execution of each of the required tests is required to constitute a Pass verdict. However, it is noted that to provide a foundation for interoperability, it is necessary that a qualified implementation consistently and repeatedly pass any of the applicable tests.

In any case, where a member finds an issue with the test plan generated by the Bluetooth SIG qualification tool, with the test case as described in the Test Suite, or with the test system utilized, the member is required to notify the responsible party via an erratum request such that the issue may be addressed.

4.1.3 Baseband assumptions

All test cases, except Connectionless Peripheral Broadcast, Synchronization Train, and Truncated Paging, are built upon having a Base Band Link up and running.

- The IUT and the Lower Tester must be in connection state (Active mode).
- DM1 packages must be used (Section 6.2 Preambles).
- All test cases are built upon a connection between two (2) devices, a Central and a Peripheral.

Connectionless Peripheral Broadcast and Synchronization Train cases are built upon having a Connectionless Peripheral Broadcast enabled.

Truncated Page testing assumes both devices are in Standby.

4.1.4 Role Switch

To force the IUT to become Central of the Piconet, Paging of the Lower Tester must be used as PDU LMP_SWITCH_REQ is optional and all IUTs will not support this (Section 6 Appendix MSC and Section 6.2 Preambles).

4.1.5 Default settings

The default settings must be carried out before each test case to guarantee a correct set up each time the tests are performed. Please see Section 6.2 Preambles for the set up messages used.

4.1.6 Applicable parameter values

The parameter values indicated in the test cases are thought to be reasonable. However, what is reasonable ultimately depends on the user scenario the IUT is intended for. In those cases where the Bluetooth System Specification does not require the implementation of a specific value, and the IUT cannot support the value indicated in a test case, it is allowed to test the IUT with another value. The selected value has to be given as IXIT information. When a value deviates from what is indicated in the test case, it is selected as close as possible to the value indicated in the test case. The selected value must not be such that the test purpose for the test case cannot be verified or the test case is not applicable. All test cases applicable as determined by the combination of Test Case Reference List, Implementation Conformance Statement and Test Case Mapping Table, must be executed successfully to complete the qualification of the IUT.

4.1.7 Pass/Inconclusive/Fail verdict conventions

Each test case has an Expected Outcome section. The IUT is granted the Pass verdict when all the detailed pass criteria conditions within the Expected Outcome section are met.

Certain test cases also have an Inconclusive verdict defined. If the conditions for this verdict are met, then the test provides evidence that the IUT neither meets nor violates the test case; instead, it means that the test case was not applicable to the IUT, and therefore a Pass verdict is not required in order to achieve Qualification of the IUT. Implementers are encouraged to provide mechanisms to avoid the behavior leading to an Inconclusive condition during testing.

The convention in this Test Suite is that, unless there is a specific set of fail conditions outlined in the test case, the IUT fails the test case as soon as one of the pass criteria conditions cannot be met. If this occurs, then the outcome of the test is a Fail verdict.

For an Inconclusive verdict, all the pass criteria conditions apply up to the point in the test procedure where an Inconclusive verdict is identified. If one of the pass criteria in a step prior to the Inconclusive verdict cannot be met, then the outcome of the test is the Fail verdict and not the Inconclusive verdict.

4.1.8 Notation conventions

The conventions in documenting events have varied over time, between different specification versions as well as their respective Test Suites. Due to this legacy, instances of "_event", "_Event", and "Event" may occur in this Test Suite; all those should be understood to equate to "event" as the settled convention applied in Bluetooth 5.1 and later specifications. It is intended to harmonize usage in this Test Suite over time.

4.2 Common Packet Contents

4.2.1 Fields and Bits Reserved for Future Use

Unless a specific test states otherwise, all fields within packets and all bits within fields that are described as reserved for future use are set to 0 in packets sent by the Upper and Lower Testers.

4.3 Generic Events

Verify the correct implementation of the Generic Events.

4.3.1 HCI_Command_Status event alternatives

- Preamble Procedure

Alternative 1A (The IUT reports an error in the HCI_Command_Status event):

- 1A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with the Status set to the appropriate error code.

Alternative 1B (The IUT reports an error in the procedure-specific event):

- 1B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with the Status set to 0x00.
- 1B.2 The IUT sends the appropriate HCI event with the appropriate error code.

- Notes

This alternative is not applicable in the following circumstances:

- Any command that contains parameter values are out of range, unsupported, or inconsistent with another parameter must perform ALT 1A.
- Any command that has sent or received a packet over the air must perform ALT 1B.



HCI/GEV/BV-01-C [Unsupported Commands on each supported controller]

- Test Purpose

Verify that for each controller supported in the IUT, every HCI command not supported yields a Command Complete event with status 'Unknown HCI Command' in return.

- Reference

[1] 7.7.14

- Initial Condition

- The IUT is not connected to the Lower Tester.

- Test Procedure

Repeat for each supported controller (1: BR/EDR Controller, 2: LE Controller, 3: AMP Controller) which has an unsupported HCI command.

The Upper Tester sends HCI commands not supported by the IUT and expects the IUT to return HCI_Command_Complete event or HCI_Command_Status event with Status = Unknown HCI Command.

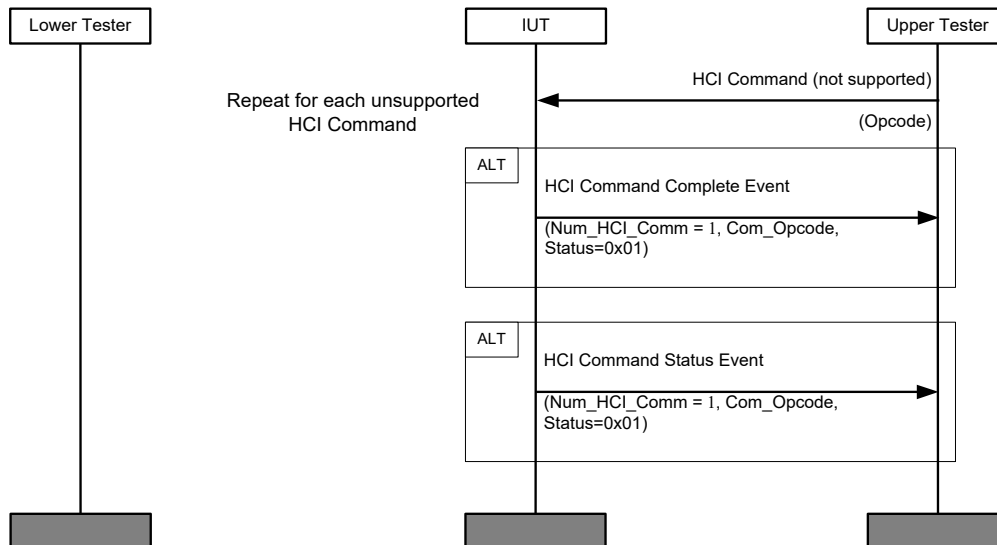


Figure 4.1: HCI/GEV/BV-01-C [Unsupported Commands on each supported controller] MSC

- Expected Outcome

Pass verdict

The IUT returns either an HCI_Command_Complete event with Status = Unknown HCI Command or an HCI_Command_Status event with Status = Unknown HCI Command.

- Notes

The test is run for all HCI commands indicated as not supported in the ICS. If all commands are supported on all supported controllers, then the test is not applicable.

Acceptable error codes for non-supported HCI Remote Name Request Cancel are: 0x01 or, alternately, 0x1F (Unspecified Error) or 0x0C (Command Disallowed).

HCI/GEV/BV-02-C [Disallow Mixing Legacy and Extended Advertising Commands]

- Test Purpose

Verify that each supported legacy and extended advertising command yields a Command Complete event with status 'Command Disallowed' in return when sent after a command of the other type.

- Reference

[9] 3.19.1

- Test Procedure

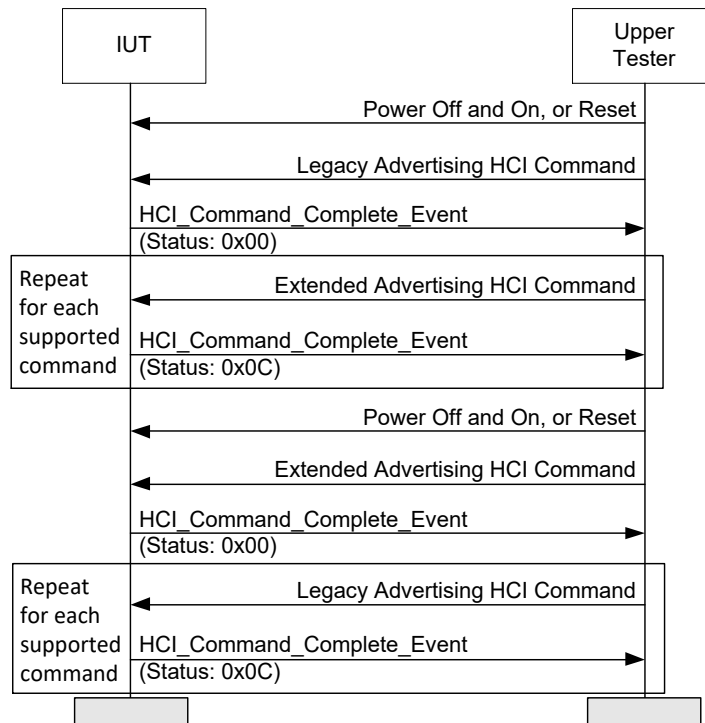


Figure 4.2: HCI/GEV/BV-02-C [Disallow Mixing Legacy and Extended Advertising Commands] MSC

1. The Upper Tester powers the IUT off and on or sends a reset.
2. The Upper Tester sends an LE Set Advertising Parameters command to the IUT and receives a Command Complete event with Status set to 0x00 (Success) in return.
3. For each command listed in Table 4.2, the Upper Tester sends the command and receives a Command Complete event with Status set as specified in Table 4.2 in return.

Round	Command (Step 3)	Command Complete Event
1	LE Set Extended Advertising Parameters	0x0C (Command Disallowed)
2	LE Set Extended Advertising Data	0x0C (Command Disallowed)
3	LE Set Extended Scan Response Data	0x0C (Command Disallowed)
4	LE Set Extended Advertising Enable	0x0C (Command Disallowed)
5	LE Read Maximum Advertising Data Length	0x0C (Command Disallowed)
6	LE Read Number Of Supported Advertising Sets	0x0C (Command Disallowed)
7	LE Remove Advertising Set	0x0C (Command Disallowed)
8	LE Clear Advertising Sets	0x0C (Command Disallowed)

Round	Command (Step 3)	Command Complete Event
9	LE Set Periodic Advertising Parameters	0x0C (Command Disallowed)
10	LE Set Periodic Advertising Data	0x0C (Command Disallowed)
11	LE Set Periodic Advertising Enable	0x0C (Command Disallowed)
12	LE Set Periodic Advertising Sync Transfer Parameters	0x0C (Command Disallowed) or 0x02 (Unknown Connection Identifier)
13	LE Set Default Periodic Advertising Sync Transfer Parameters	0x0C (Command Disallowed)

Table 4.2: Commands for each case variation

4. The Upper Tester powers the IUT off and on or sends a reset.
5. The Upper Tester sends an LE Set Extended Advertising Parameters command to the IUT and receives a Command Complete event with Status set to 0x00 (Success) in return.
6. For each command listed in Table 4.3, the Upper Tester sends the command and receives a Command Complete event with Status set to 0x0C (Command Disallowed) in return.

Round	Command (Step 6)
1	LE Set Advertising Parameters
2	LE Read Advertising Channel Tx Power
3	LE Set Advertising Data
4	LE Set Scan Response Data
5	LE Set Advertising Enable

Table 4.3: Commands for each case variation

- Expected Outcome

Pass verdict

After receiving a legacy advertising command, the IUT returns an HCI_Command_Complete event with Status = Command Disallowed for any extended advertising command.

After receiving an extended advertising command, the IUT returns an HCI_Command_Complete event with Status = Command Disallowed for any legacy advertising command.

HCI/GEV/BV-03-C [Disallow Mixing Legacy and Extended Scanning Commands]

- Test Purpose

Verify that each supported legacy and extended scanning command yields a Command Complete or Command Status event with status 'Command Disallowed' in return when sent after a command of the other type.

- Reference

[9] 3.19.1

- Test Procedure

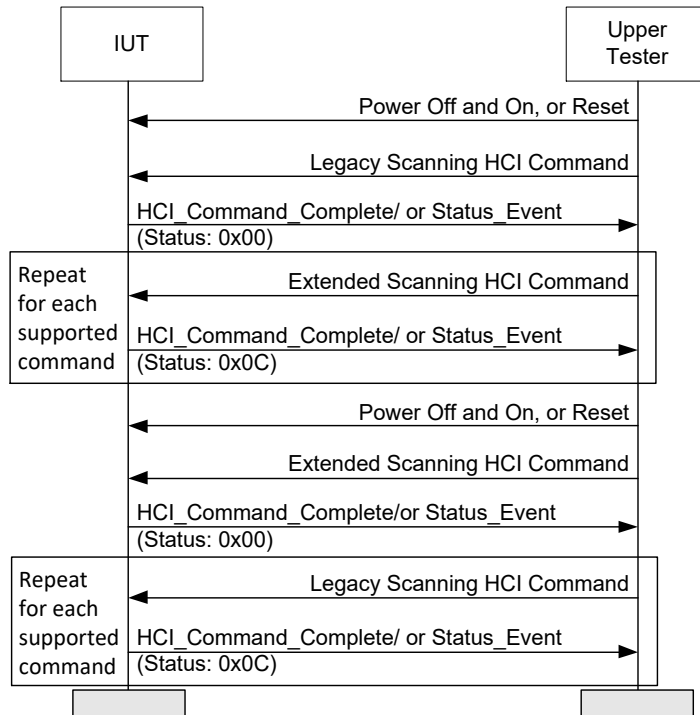


Figure 4.3: HCI/GEV/BV-03-C [Disallow Mixing Legacy and Extended Scanning Commands] MSC

1. The Upper Tester powers the IUT off and on or sends a reset.
2. The Upper Tester sends an LE Set Scan Parameters command to the IUT and receives a Command Complete event with Status set to 0x00 (Success) in return.
3. For each command listed in [Table 4.4](#), the Upper Tester sends the command and receives a Command Complete or Command Status event with Status set to 0x0C (Command Disallowed) in return.

Round	Command (Step 3)	Associated Event
1	LE Set Extended Scan Parameters	HCI_Command_Complete event
2	LE Set Extended Scan Enable	HCI_Command_Complete event
3	LE Extended Create Connection	HCI_Command_Status event
4	LE Periodic Advertising Create Sync	HCI_Command_Status event
5	LE Periodic Advertising Create Sync Cancel	HCI_Command_Complete event
6	LE Periodic Advertising Terminate Sync	HCI_Command_Complete event
7	LE Add Device To Periodic Advertiser List	HCI_Command_Complete event
8	LE Remove Device From Periodic Advertiser List	HCI_Command_Complete event
9	LE Clear Periodic Advertiser List	HCI_Command_Complete event
10	LE Read Periodic Advertiser List Size	HCI_Command_Complete event

Table 4.4: Commands for each case variation

4. The Upper Tester powers the IUT off and on or sends a reset.
5. The Upper Tester sends an LE Set Extended Scan Parameters command to the IUT and receives a Command Complete event with Status set to 0x00 (Success) in return.
6. For each command listed in [Table 4.5](#), the Upper Tester sends the command and receives a Command Complete or Command Status event with Status set to 0x0C (Command Disallowed) in return.

Round	Command (Step 6)	Associated Event
1	LE Set Scan Parameters	HCI_Command_Complete event
2	LE Set Scan Enable	HCI_Command_Complete event
3	LE Create Connection	HCI_Command_Status event

Table 4.5: Commands for each case variation

- Expected Outcome

Pass verdict

After receiving a legacy scanning command, the IUT returns an HCI Command Complete or Command Status event with Status = Command Disallowed for any extended scanning command.

After receiving an extended scanning command, the IUT returns an HCI Command Complete or Command Status event with Status = Command Disallowed for any legacy scanning command.

HCI/GEV/BV-04-C [Extended Advertising Commands Without Scan Response Data]

- Test Purpose

Verify that the LE Extended Advertising Enable command yields a Command Complete event with status 'Command Disallowed' in return when no scan response data has been provided.

- Reference

[9] 7.8.55, 7.8.56

- Test Procedure

1. The Upper Tester powers the IUT off and on or sends a reset.
2. The Upper Tester sends an LE Set Extended Advertising Parameters command to the IUT with scannable advertising property bit set to 1 and receives a Command Complete event with Status set to 0x00 (Success) in return.
3. The Upper Tester sends an LE Set Extended Scan Response Data command to the IUT with no scan response data specified and receives a Command Complete event with Status set to 0x00 (Success) in return.
4. The Upper Tester sends an LE Set Extended Advertising Enable command to the IUT with no scan response data provided and receives a Command Complete event with Status set to 0x0C (Command Disallowed) in return.

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event with Status set to 0x00 (Success) when the Upper Tester sends a HCI LE Set Extended Scan Response Data command with no scan response data.

The IUT returns an HCI_Command_Complete event with Status set to 0x0C (Command Disallowed) for HCI Set Extended Advertising Enable.



HCI/GEV/BI-01-C [HCI Command with RFU OGF]

- Test Purpose

Verify that the IUT returns an Unknown HCI Command error when receiving an HCI command with an RFU (0x3E) OGF.

- Reference

[9] 5.4.1

- Test Procedure

Repeat Steps 1 and 2 for OCF values 0x000 to 0x00F, 0x3F0 to 0x3FF, and 20 random values between 0x010 and 0x3EF.

1. The Upper Tester sends an HCI command packet to the IUT with OGF set to 0x3E and OCF set as specified.
2. The IUT sends an HCI_Command_Complete event with Status set to Unknown HCI Command (0x01).

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an Unknown HCI Command error code.

4.4 Device Setup

Verify the correct implementation of the Device Setup commands.

HCI/DSU/BV-01-C [BR/EDR Controller Reset Command]

- Test Purpose

Verify that the Reset command will reset the Controller, Link Manager, and the Bluetooth radio.

- Reference

[1] 7.3.2

- Initial Condition

- See Section 4.1.3.

- Test Procedure

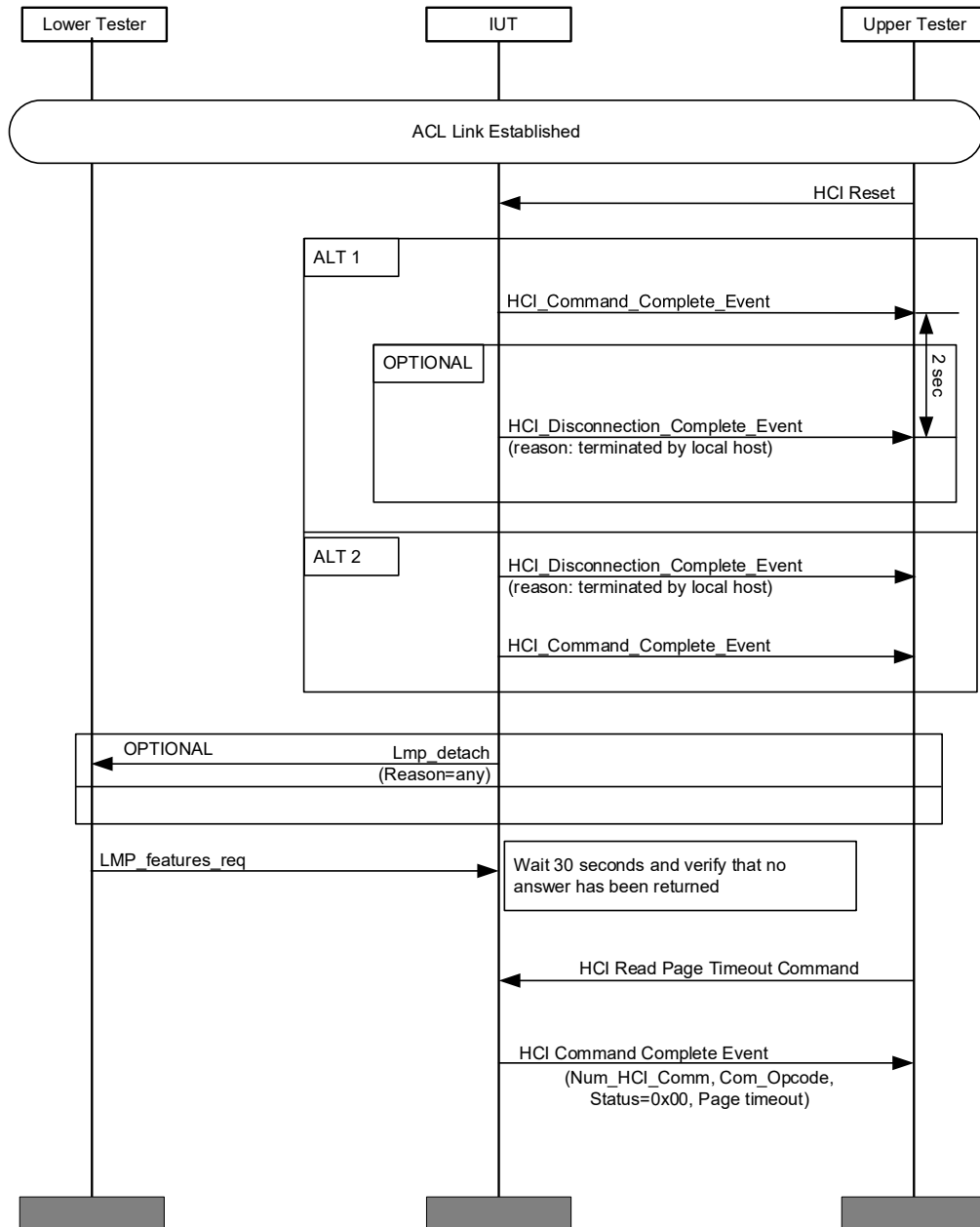


Figure 4.4: HCI/DSU/BV-01-C [BR/EDR Controller Reset Command] MSC

- Expected Outcome

Pass verdict

The IUT disconnects the ACL link after receiving an *HCI_Reset* command.

The IUT returns the default page timeout.

HCI/DSU/BV-02-C [Reset in Advertising State]

- Test Purpose

Verify that after receiving the *HCI_Reset* the Bluetooth LE controller in advertiser state enters into Standby state.

- Reference

[1] 7.3.2

- Initial Condition

- The IUT is configured in advertising state.

- Test Procedure

The Lower Tester receives *ADV_IND* packets from the IUT.

The Upper Tester sends HCI Reset to the IUT and receives the *HCI_Command_Complete* event with Status = Success.

The Lower Tester receives no *ADV_IND* packets from the IUT.

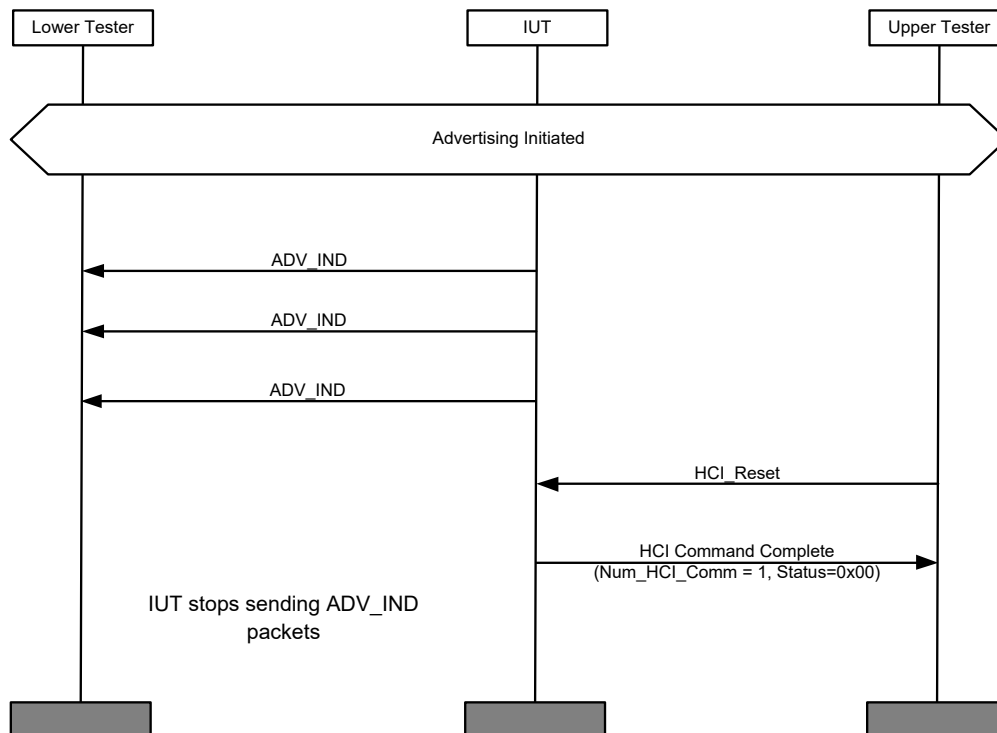


Figure 4.5: HCI/DSU/BV-02-C [Reset in Advertising State] MSC

- Expected Outcome

Pass verdict

The IUT returns an *HCI_Command_Complete* event with Status = Success.

The IUT stops sending *ADV_IND* packets after reset command has been completed.

HCI/DSU/BV-03-C [Reset to Peripheral]

- Test Purpose

Verify that after receiving the *HCI_Reset* the Bluetooth LE controller in Peripheral role enters into Standby state. Verify that the link layer connection is lost.

- Reference

[1] 7.3.2

- Initial Condition

- LL connection established. The IUT is configured as Peripheral.

- Test Procedure

The Lower Tester sends data to the IUT and receives data confirmation.

The Upper Tester sends *HCI_Reset* to the IUT and receives the *HCI_Command_Complete* event with Status = Success.

The Lower Tester continues sending data packets and receives no packets from the IUT until connection timeout expires.

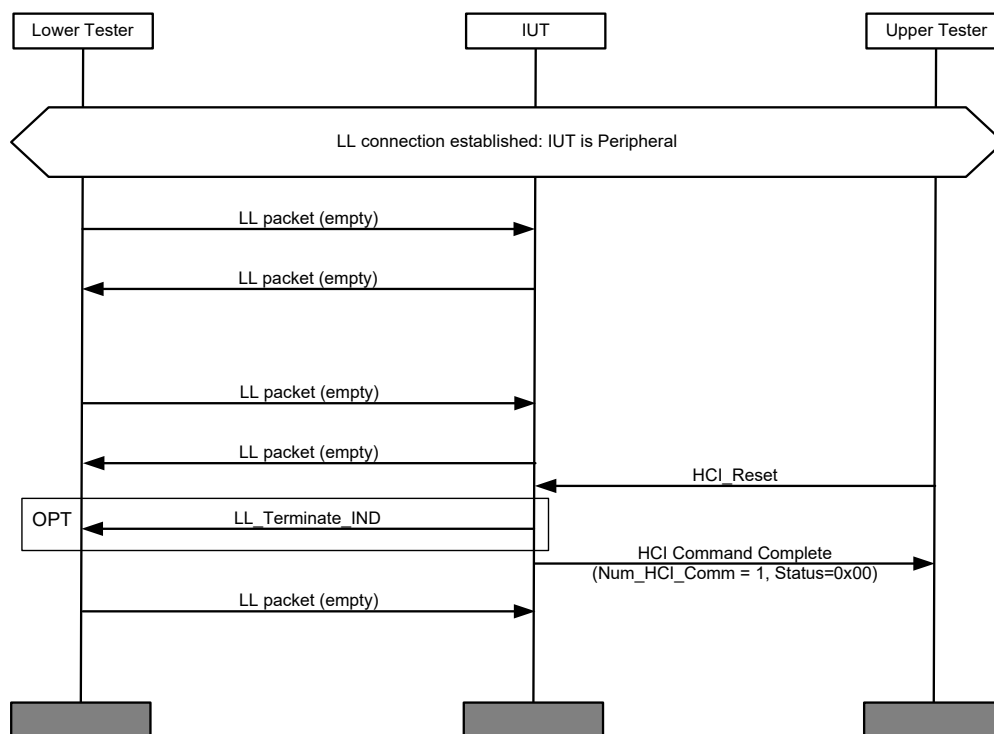


Figure 4.6: HCI/DSU/BV-03-C [Reset to Peripheral] MSC

- Expected Outcome

Pass verdict

The IUT returns an *HCI_Command_Complete* event with Status = Success.

The IUT stops sending data packets after reset command has been completed.

HCI/DSU/BV-04-C [Reset in Scanning State]

- Test Purpose

Verify that after receiving the *HCI_Reset*, the Bluetooth LE controller in scanning state IUT does not send any HCI LE Advertising Report Events.

- Reference

[1] 7.3.2

- Initial Condition

- The IUT is configured in passive scanning state. The Lower Tester is in advertising state.

- Test Procedure

The Upper Tester receives HCI LE Advertising Report Event from the IUT.

The Upper Tester sends HCI Reset to the IUT and receives the HCI_Command_Complete event with Status = Success.

The Upper Tester receives no more HCI LE Advertising Report Events from the IUT.

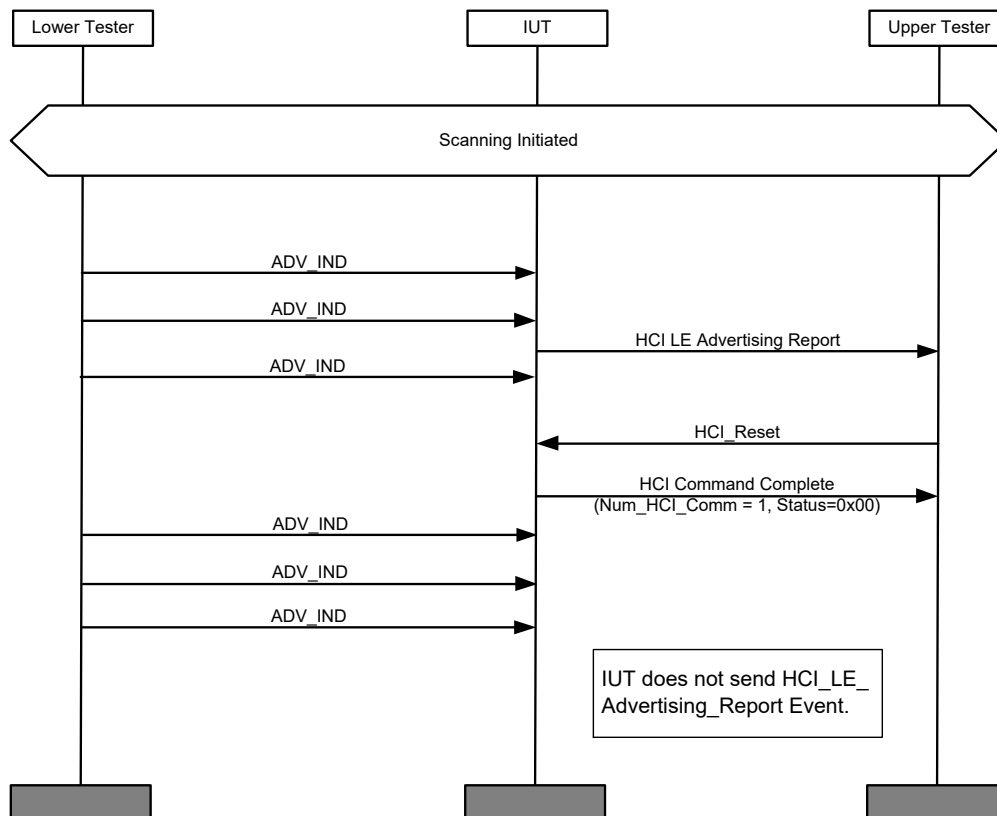


Figure 4.7: HCI/DSU/BV-04-C [Reset in Scanning State] MSC

- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success.

The IUT does not send HCI LE Advertising Report Event after reset.

HCI/DSU/BV-05-C [Reset in Initiating State]

- Test Purpose

Verify that after receiving the *HCI_Reset* the Bluetooth LE controller in initiating state enters into Standby state.

- Reference

[1] 7.3.2

- Initial Condition

- The IUT is configured to be in initiating state. The Lower Tester is in idle state.

- Test Procedure

The Upper Tester sends HCI LE Create Connection to the IUT and receives HCI_Command_Status event with Status = Success.

The Upper Tester sends HCI Reset to the IUT and receives the HCI_Command_Complete event with Status = Success.

After the Upper Tester receives command complete for HCI Reset, the Lower Tester sends *ADV_IND* packets and receives no *CONNECT_REQ* packets from the IUT.

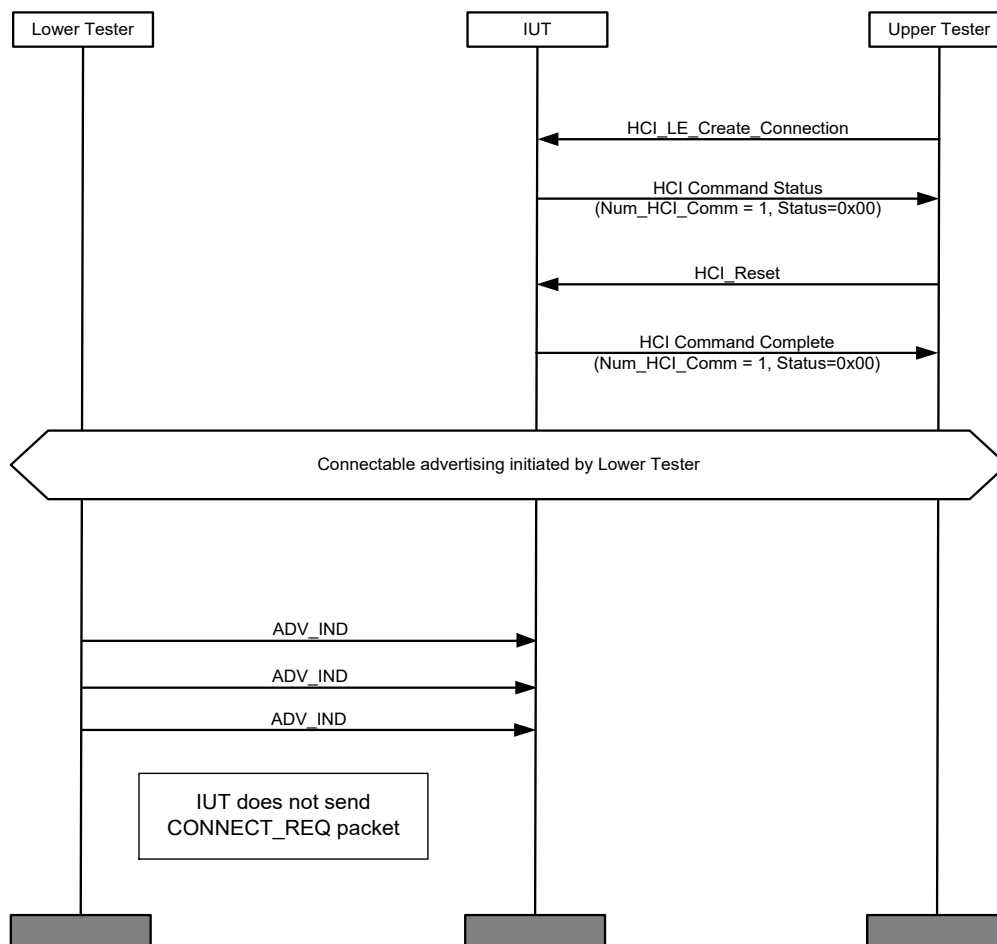


Figure 4.8: HCI/DSU/BV-05-C [Reset in Initiating State] MSC

- Pass verdict

The IUT does not send *CONNECT_REQ* packet after *Command_Complete* event of the Reset command.

HCI/DSU/BV-06-C [Reset to Central]

- Verify that after receiving the *HCI_Reset* the Bluetooth LE controller in Central role enters into Standby state. Verify that the link layer connection is lost.

- [1] 7.3.2

- LL connection is established. The IUT is configured as Central.

- The Upper Tester sends HCI Reset to the IUT and receives the HCI_Command_Complete event with Status = Success.

```
sequenceDiagram
    participant LT as Lower Tester
    participant IUT as IUT
    participant UT as Upper Tester

    Note over LT, IUT, UT: LL connection established: IUT is Central
    IUT->>LT: LL packet (empty)
    LT->>IUT: LL packet (empty)
    IUT->>LT: LL packet (empty)
    LT->>IUT: LL packet (empty)
    IUT->>UT: HCI Reset
    IUT->>LT: LL_Terminate_IND
    LT->>UT: HCI Command Complete (Num_HCI_Comm = 1, Status=0x00)
```



- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success.

The IUT stops sending data packets after reset command has been completed.

HCI/DSU/BV-07-C [AMP Controller Reset Command]

- Test Purpose

Verify that the Reset Command will reset the HCI and the AMP PAL.

- Reference

[\[1\]](#) 7.3.2

- Initial Condition

- See Section [4.1.3](#).

- Test Procedure

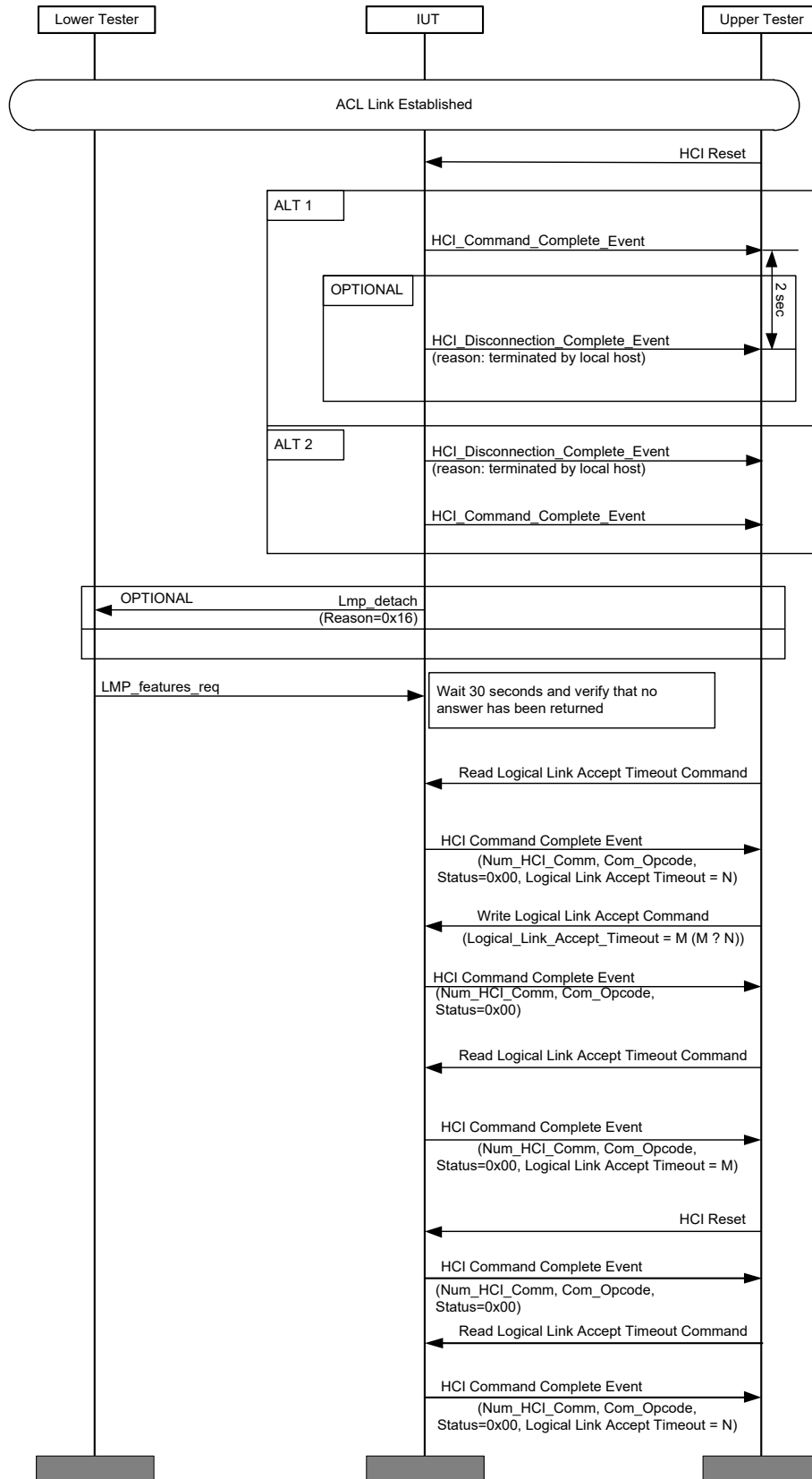


Figure 4.10: HCI/DSU/BV-07-C [AMP Controller Reset Command] MSC

- Expected Outcome

Pass verdict

The IUT returns the default Logical Link Accept Timeout.

4.5 Controller Flow Control

Verify the correct implementation of the Controller Flow Control commands

4.5.1 Read Buffer Size Command

- Test Purpose

Verify that the Read_Buffer_Size command returns the buffer size, and that when data is transferred a 'number of completed packets' response is returned per packet.

- Reference

[13] 7.4.5

- Initial Condition

- The IUT is in STANDBY Mode-3.

- Test Case Configuration

TCID	PHY	SCO or eSCO data over HCI support
HCI/CFC/BV-01-C	BR/EDR	Supported
HCI/CFC/BV-03-C	AMP	Supported
HCI/CFC/BV-06-C	BR/EDR	Not Supported
HCI/CFC/BV-07-C	AMP	Not Supported

Table 4.6: Read Buffer Size Command test cases

- Test Procedure

In the HCI ACL_Data_Packet, the N parameter is the data packet length returned in the HCI_Read_Buffer_Size command.

An ACL connection is established using the PHY as specified in [Table 4.6](#).

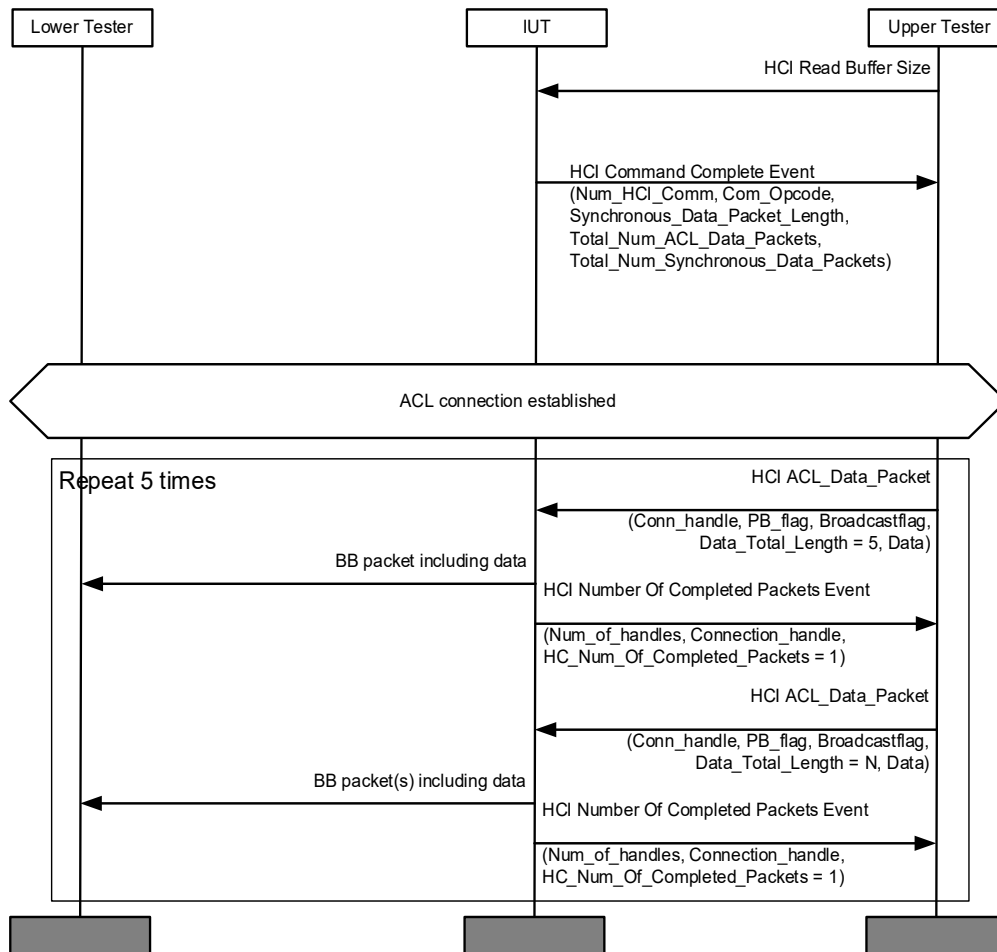


Figure 4.11: Read Buffer Size Command MSC

- Expected Outcome

Pass verdict

The value of ACL_Data_Packet_Length is greater than zero and less than the maximum ACL Data Packet size for a controller that supports BR/EDR in the returned HCI_Command_Complete event. If the controller supports SCO or eSCO over HCI as specified in [Table 4.6](#), the value of Synchronous_Data_Packet_Length is greater than zero and less than the maximum Synchronous Data Packet size.

The IUT returns one 'number of completed packets' response per packet for 1-byte packets.

The IUT returns one 'number of completed packets' response per packet for buffer-sized packets.

- Notes

All packets sent over HCI are valid L2CAP packets. In the first part of the test, the single byte data payload is encoded as an L2CAP packet with a 4-byte L2CAP header. For the second part of the test, for a buffer size N, the data payload is N-4 to allow for the L2CAP header.

HCI/CFC/BV-02-C [Buffer Size]

- Test Purpose

Verify that the IUT returns the buffer size of the controller when receiving the LE_Read_Buffer_Size command.

- Reference

[8] 7.8.2

- Initial Condition

- No LL connection exists.

- Test Procedure

The Upper Tester sends HCI_LE_Read_Buffer_Size and receives an HCI_Command_Complete event in response with Status = Success.

In the HCI ACL_Data_Packet, the N parameter is the data packet length returned in the HCI_LE_Read_Buffer_Size command.

An ACL connection is established using the Bluetooth LE PHY.

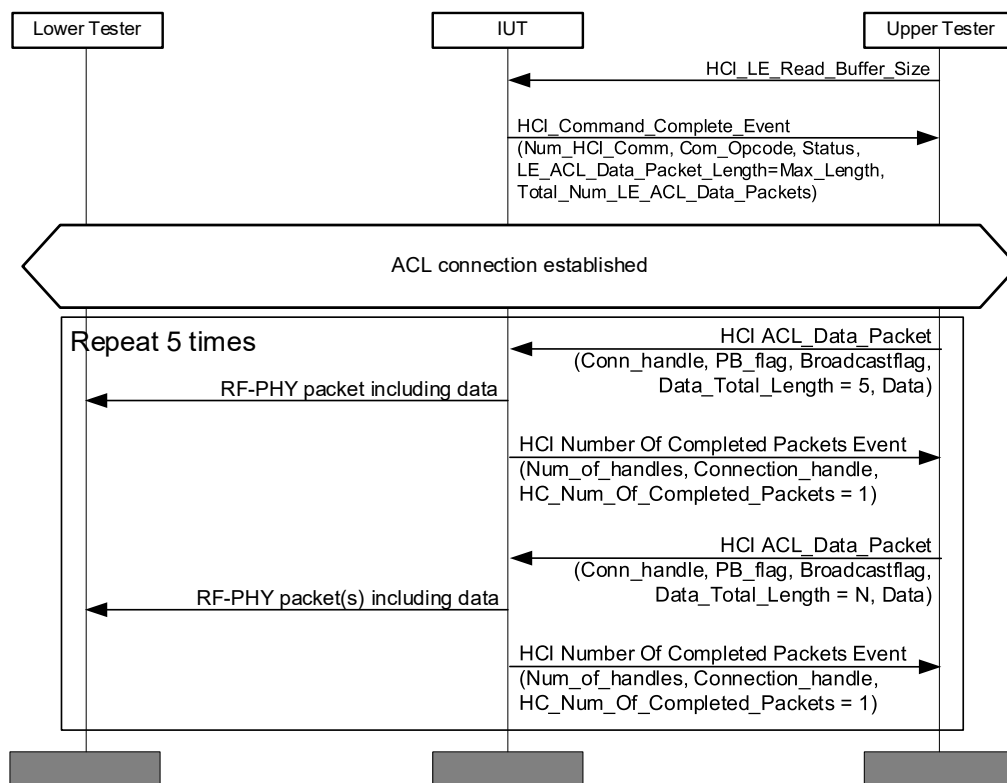


Figure 4.12: HCI/CFC/BV-02-C [Buffer size] MSC

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event with Status = Success and Data_Packet_Length and Num_Data_Packet parameters with correct values.

The IUT returns one 'number of completed packets' response per packet for 1-data-byte packets.

The IUT returns one 'number of completed packets' response per packet for buffer-sized packets.

- Notes

All packets sent over HCI are valid L2CAP packets. In the first part of the test, the single byte data payload is encoded as an L2CAP packet with a 4-byte L2CAP header. For the second part of the test, for a buffer size N, the data payload is N-4 to allow for the L2CAP header.

4.5.2 Read Buffer Size and LE Read Buffer Size commands, Combined Data Buffers

- Test Purpose

Verify that the Read_Buffer_Size and LE_Read_Buffer_Size commands on a device that has combined data buffers for both BR/EDR and LE return the proper buffer size on dual-mode devices, and that when data is transferred using both BR/EDR and LE connections, a 'number of completed packets' response is returned per packet.

- Reference

[13] 7.4.5, 7.8.2

- Initial Condition

- The IUT is not connected to the Lower Tester.

- Test Case Configuration

TCID	SCO or eSCO data over HCI support
HCI/CFC/BV-04-C [Read Buffer Size and LE Read Buffer Size commands, Combined Data Buffers, SCO or eSCO data over HCI supported]	Supported
HCI/CFC/BV-08-C [Read Buffer Size and LE Read Buffer Size commands, Combined Data Buffers, SCO or eSCO data over HCI not supported]	Not Supported

Table 4.7: Read Buffer Size and LE Read Buffer Size commands, Combined Data Buffers

- Test Procedure

In the HCI_ACL_Data_Packet, the N parameter is the data packet length returned in the HCI_Read_Buffer_Size command.

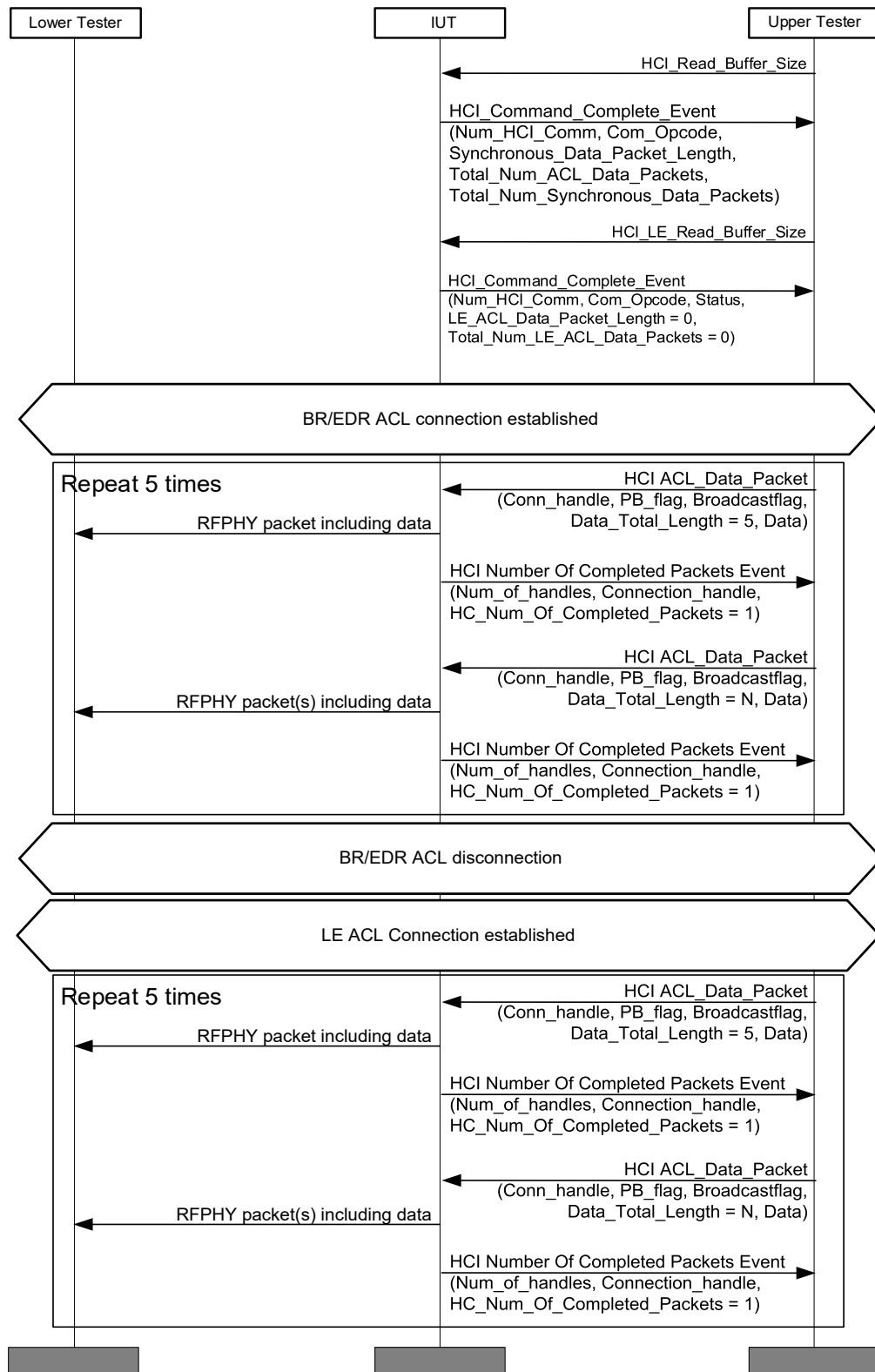


Figure 4.13: Read Buffer Size and LE Read Buffer Size commands, Combined Data Buffers MSC

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event to the HCI_Read_Buffer_Size command with Status = Success. The value of ACL_Data_Packet_Length is greater than zero and less than the maximum ACL Data Packet size for a controller that supports BR/EDR. If the controller supports SCO or eSCO over HCI as specified in [Table 4.7](#), the value of Synchronous_Data_Packet_Length is greater than zero and less than the maximum Synchronous Data Packet size.

The IUT returns an HCI_Command_Complete event to the HCI_LE_Read_Buffer_Size command with Status = Success and LE_Data_Packet_Length = 0 and Num_LE_Data_Packets = 0.

The IUT returns one 'number of completed packets' response per packet for 1-byte packets on both BR/EDR and LE connections.

The IUT returns one 'number of completed packets' response per packet for buffer-sized packets on both BR/EDR and LE connections.

- Notes

All packets sent over HCI are valid L2CAP packets. In the first part of the test, the single byte data payload is encoded as an L2CAP packet with a 4-byte L2CAP header. For the second part of the test, for a buffer size N, the data payload is N-4 to allow for the L2CAP header.

4.5.3 Read Buffer Size and LE Read Buffer Size commands, Separate Data Buffers

- Test Purpose

Verify that the Read_Buffer_Size and LE_Read_Buffer_Size commands that have separate data buffers for both BR/EDR and LE return the proper buffer size on dual-mode devices and that when data is transferred using both BR/EDR and LE connections, a 'number of completed packets' response is returned per packet.

- Reference

[\[13\]](#) 7.4.5, 7.8.2

- Initial Condition

- The IUT is not connected to the Lower Tester.

- Test Case Configuration

TCID	SCO or eSCO data over HCI support
HCI/CFC/BV-05-C [Read Buffer Size and LE Read Buffer Size commands, Separate Data Buffers, SCO or eSCO data over HCI supported]	Supported
HCI/CFC/BV-09-C [Read Buffer Size and LE Read Buffer Size commands, Separate Data Buffers, SCO or eSCO data over HCI not supported]	Not Supported

Table 4.8: Read Buffer Size and LE Read Buffer Size commands, Separate Data Buffers

- Test Procedure

In the HCI_ACL_Data_Packet, the N1 parameter is the data packet length returned in the HCI_Read_Buffer_Size command, and the N2 parameter is the data packet length returned in the HCI_LE_Read_Buffer_Size command.

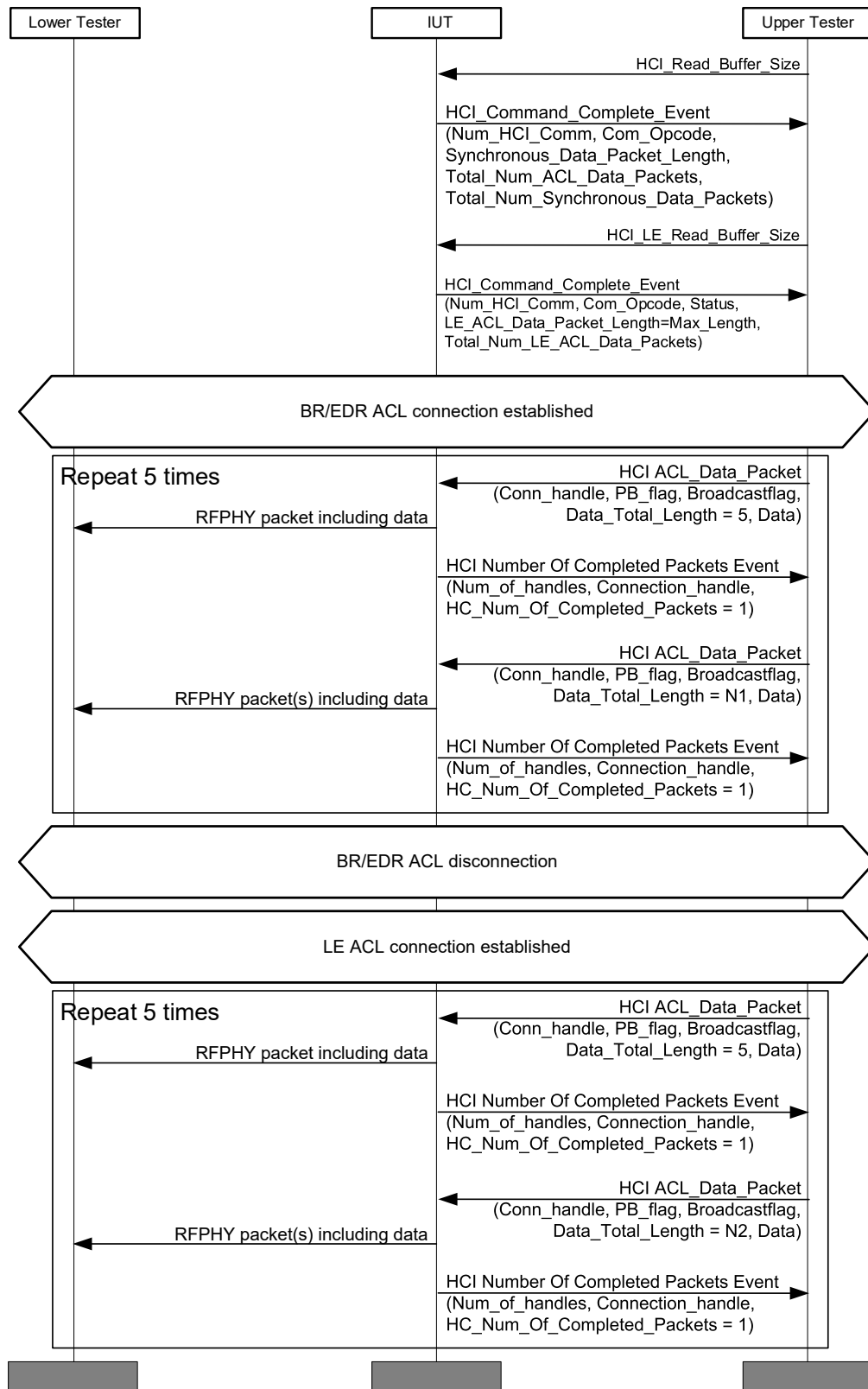


Figure 4.14: Read Buffer Size and LE Read Buffer Size commands, Separate Data Buffers MSC

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event to the HCI_Read_Buffer_Size command with Status = Success. The value of ACL_Data_Packet_Length is to be a non-zero value and less than the maximum ACL Data Packet size for a controller that supports BR/EDR. If the controller supports SCO or eSCO over HCI as specified in [Table 4.8](#), the value of Synchronous_Data_Packet_Length is to be a non-zero value and less than the maximum Synchronous Data Packet size.

The IUT returns an HCI_Command_Complete event to the HCI_LE_Read_Buffer_Size command with Status = Success and LE_Data_Packet_Length and Num_LE_Data_Packets with correct non-zero values.

The IUT returns one 'number of completed packets' response per packet for 1-byte packets on both BR/EDR and LE connections.

The IUT returns one 'number of completed packets' response per packet for buffer-sized packets on both BR/EDR and LE connections.

- Notes

All packets sent over HCI are valid L2CAP packets. In the first part of the test, the single-byte data payload is encoded as an L2CAP packet with a 4-byte L2CAP header. For the second part of the test, for a buffer size N, the data payload is N-4 to allow for the L2CAP header.

4.5.4 Read Buffer Size command, Invalid Parameters

- Test Purpose

Verify that the IUT properly responds to the HCI_Read_Buffer_Size command, reporting a number of data packets that is consistent with the IUT's support or not for SCO or eSCO over HCI.

- Initial Condition

- The IUT is in standby.

- Test Case Configuration

Test Case	Reference	Event Parameter
HCI/CFC/BI-03-C [Read Buffer Size Command, [e]SCO data over HCI not supported]	[17] 7.4.5	Total_Num_Synchronous_Data_Packets = 0
HCI/CFC/BI-04-C [Read Buffer Size Command, [e]SCO data over HCI supported]	[17] 7.4.5	Total_Num_Synchronous_Data_Packets > 0 Synchronous_Data_Packet_Length > 0

Table 4.9: Read Buffer Size command, Invalid Parameters test cases

- Test Procedure

1. The Upper Tester sends the HCI_Read_Buffer_Size command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0 and the parameters set as specified in [Table 4.9](#).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with the parameters specified in [Table 4.9](#).

4.6 Controller Information

Verify the correct implementation of the Controller Information commands.

HCI/CIN/BV-01-C [Read Local Supported Features Command]

- Test Purpose

Verify that the Read Local Supported Features command returns with the correct features supported.
- Reference

[\[1\]](#) 7.4.3
- Initial Condition
 - No LL connection exists.
- Test Procedure

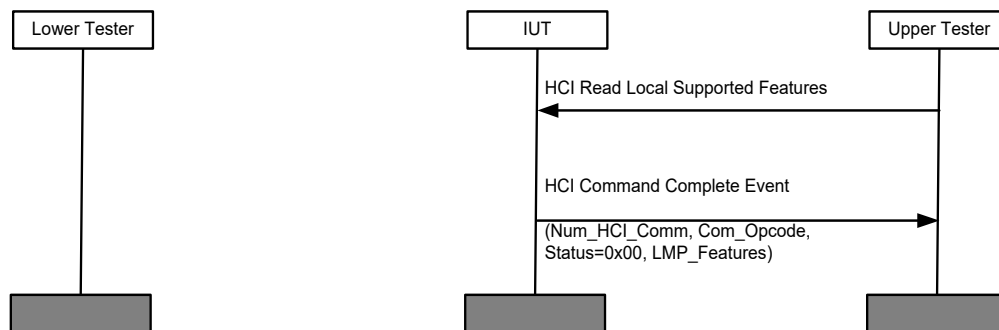


Figure 4.15: HCI/CIN/BV-01-C [Read Local Supported Features Command] MSC

- Test Condition

The manufacturer of the IUT must define features supported.
- Expected Outcome

Pass verdict

The IUT returns parameter LMP_Features containing features supported defined by the ICS as mapped by Table 3.2 in [\[21\]](#).

HCI/CIN/BV-02-C [Read Local Extended Features Command]

- Test Purpose
Verify that the Read Local Extended Features command returns with the correct features supported.
- Reference
[\[1\]](#) 7.4.4
- Initial Condition
 - No LMP connection exists.
- Test Procedure

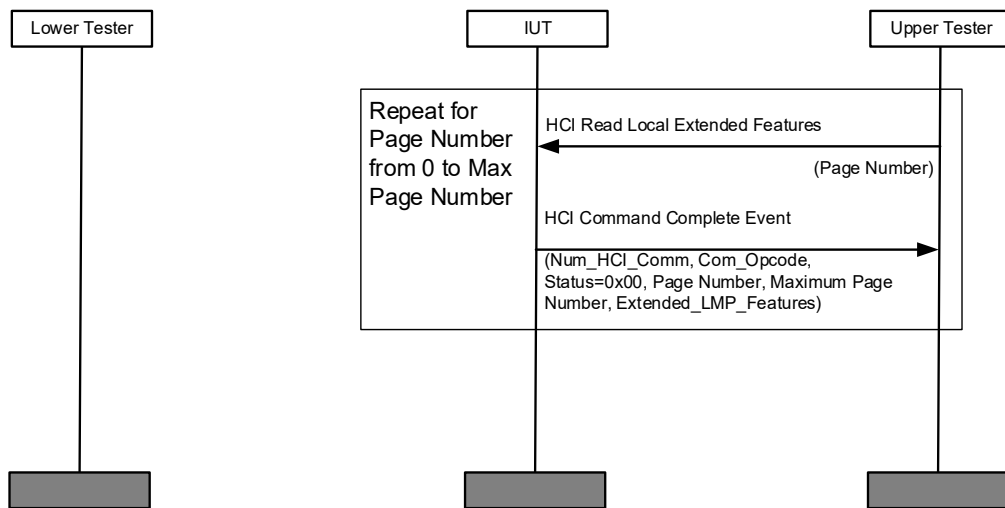


Figure 4.16: HCI/CIN/BV-02-C [Read Local Extended Features Command] MSC

- Test Condition
The manufacturer of the IUT must define the extended features supported.
- Expected Outcome
Pass verdict
The IUT returns the requested page of extended LMP_Features containing features supported defined by the ICS as mapped by Table 4.2 in [\[5\]](#).
Each HCI_Command_Complete event has the same Maximum Page Number.

4.6.1 Read Local Supported Commands command

- Test Purpose
Verify that the Read Local Supported Commands command returns with the correct commands supported.
- Reference
[\[1\]](#) 7.4.2
- Initial Condition
 - No LL connection exists.

- Test Case Configuration

Test Case	HCI Command
HCI/CIN/BV-03-C [Read Local Supported Commands [v1] command]	HCI_Read_Local_Supported_Commands [v1]
HCI/CIN/BV-17-C [Read Local Supported Commands [v2] command]	HCI_Read_Local_Supported_Commands [v2]

Table 4.10: Read Local Supported Commands command test cases

- Test Procedure

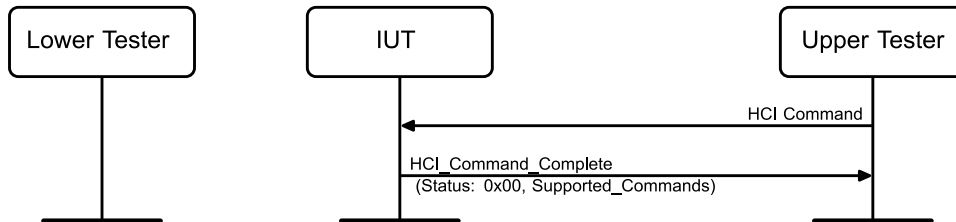


Figure 4.17: Read Local Supported Commands command MSC

- The Upper Tester sends the HCI command specified in [Table 4.10](#) to the IUT.
- The IUT sends a successful HCI_Command_Complete event to the Upper Tester with Supported_Commands.

- Test Condition

The manufacturer of the IUT must define the commands supported.

The Supported_Commands parameter matches those commands supported as mapped in the LE Command Tables in [\[2\]](#).

- Expected Outcome

Pass verdict

The IUT returns the Supported_Commands parameter with the correct commands supported as mapped in the LE Command Tables in [\[2\]](#). The HCI [v1] command returns octets 0–63 of Supported_Commands. The HCI [v2] command returns octets 0–250 of Supported_Commands.

[HCI/CIN/BV-04-C \[Read Local Version Information Command\]](#)

- Test Purpose

Verify that the Read Local Version Information command returns with the correct versions.

- Reference

[\[1\]](#) HCI 7.4.1

- Initial Condition

- No LL connection exists.

- Test Procedure

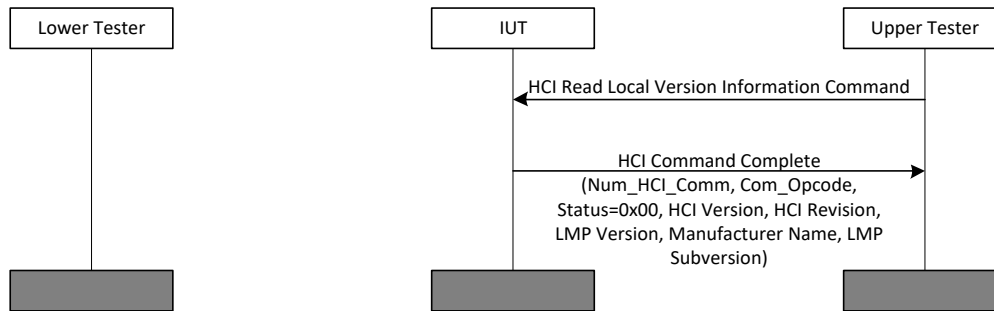


Figure 4.18: HCI/CIN/BV-04-C [Read Local Version Information Command] MSC

- Test Condition

The manufacturer of the IUT must define versions supported.

- Expected Outcome

Pass verdict

The IUT returns command complete with the version information containing HCI Version and LMP Version as defined in Bluetooth assigned numbers and HCI Revision, Manufacturer Name and LMP Subversion as defined by the manufacturer.

HCI/CIN/BV-06-C [Filter Accept List Size]

- Test Purpose

Verify that the IUT responds with the number of empty entries that the radio has in its device addresses list.

- Reference

[8] 7.8.17

- Initial Condition

- The IUT is not connected to the Lower Tester.

- Test Procedure

The Upper Tester sends HCI LE Clear Filter Accept List.

The Upper Tester reads the IUT's Filter Accept List size. The Upper Tester receives HCI_Command_Complete event with Filter Accept List Size parameter equal or greater than 1.

The Upper Tester adds different addresses until the list is full.

The Upper Tester adds one more address and expects the IUT to return an HCI_Command_Complete event with Status = Memory Capacity Exceeded.

The Upper Tester removes one address from the Filter Accept List so that there is now space for one more address.

The Upper Tester adds another address and expects the IUT to return an HCI_Command_Complete event with Status = Success.

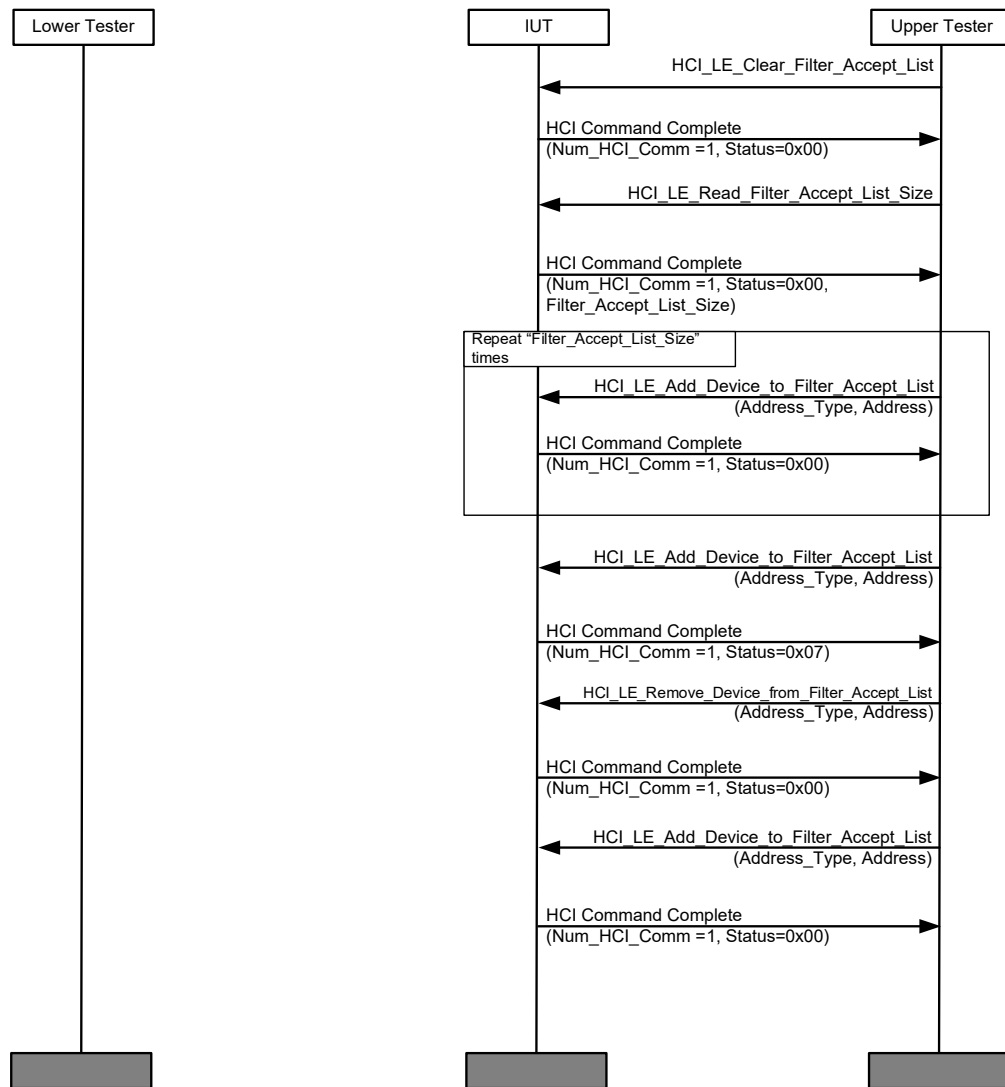


Figure 4.19: HCI/CIN/BV-06-C [Filter Accept List Size] MSC

- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success in response to HCI LE Read Filter Accept List Size command and with Filter Accept List Size parameter greater or equal to 0x01.

The IUT returns HCI Command Complete with Status = Success in response to HCI Add Device to Filter Accept List command while there is enough space in the list.

The IUT returns HCI Command Complete with Status = Memory Capacity Exceeded in response to HCI Add Device to Filter Accept List command while there is not enough space in the list.

The IUT returns HCI Command Complete with Status = Success in response to HCI Remove Device from Filter Accept List command.

The IUT returns HCI Command Complete with Status = Success in response to HCI Add Device to Filter Accept List command.

HCI/CIN/BV-07-C [REMOVED TEST]

Test deleted. Section intentionally left blank.

HCI/CIN/BV-08-C [Read Local Simple Pairing Options Command]

- **Test Purpose**
Verify that the Read Local Simple Pairing Options command returns with the correct options and key size supported.
- **Reference**
[\[10\]](#) 7.4.9
- **Initial Condition**
 - The IUT is not connected to the Lower Tester.
- **Test Procedure**

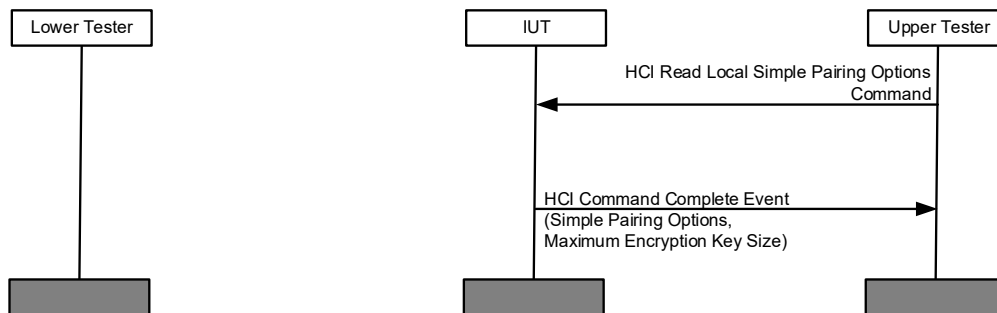


Figure 4.20: HCI/CIN/BV-08-C [Read Local Simple Pairing Options Command] MSC

- **Test Condition**
The manufacturer of the IUT supports remote public key validation performed and maximum encryption key size.
- **Expected Outcome**
Pass verdict
The IUT has set the 'Remote public key validation is always performed' (bit 0) in the Simple Pairing Options Field to 1.
The IUT returns a Maximum Encryption Key Size greater than or equal to 0x07 and less than or equal to 0x10.

HCI/CIN/BV-09-C [Read LE Public Key Validation Feature Bit]

- **Test Purpose**
Verify that the LE Read Local Supported Features Page 0 command returns with the Remote Public Key Validation feature bit enabled.
- **Reference**
[\[1\]](#) 7.4.3
- **Initial Condition**
 - The IUT is not connected to the Lower Tester.

- Test Procedure

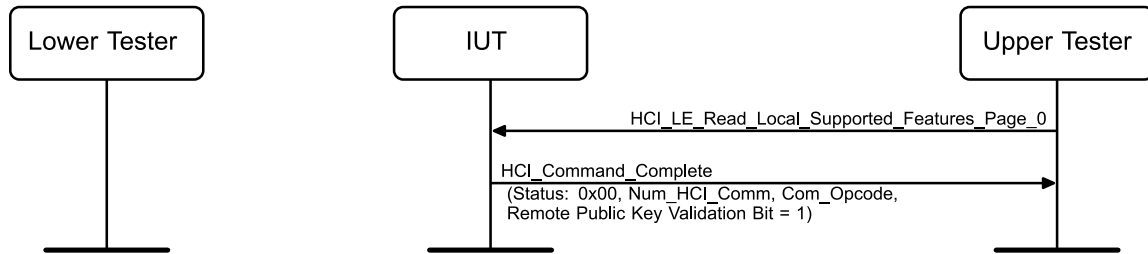


Figure 4.21: HCI/CIN/BV-09-C [Read LE Public Key Validation Feature Bit] MSC

- Expected Outcome

Pass verdict

The IUT returns a FeatureSet field with the Remote Public Key Validation bit set to 1.

4.6.2 Read Local Supported Codec Capabilities

- Test Purpose

Verify that the Read_Local_Supported_Codecs command returns the correct codecs for the supported transport. For each supported codec, verify that the Read Local Supported Codec Capabilities returns the proper capabilities. Also verify that the proper min and max controller delay values are returned in the Read Local Supported Controller Delay.

- Reference

[12] 7.4.8

- Initial Condition

- The IXIT parameters are specified in Table 4.11.

IXIT Parameter	Description
TSPX_Number_Supported_Standard_Codecs_BR_EDR	Number of Standard Codecs, BR/EDR
TSPX_Number_Supported_Standard_Codecs_All_PHYs	Number of Standard Codecs, All PHYs
TSPX_Number_Supported_Vendor_Codecs_BR_EDR	Number of Vendor Specific Codecs, BR/EDR
TSPX_Number_Supported_Vendor_Codecs_All_PHYs	Number of Vendor Specific Codecs, All PHYs

Table 4.11: Read Local Supported Codec Capabilities IXIT parameters

- Test Case Configuration

Test Case	HCI Command	Return Parameters	Execute Steps 4–13
HCI/CIN/BV-10-C [Read Local Supported Codec Capabilities, BR/EDR]	HCI_Read_Local_Supported_Codecs [v1]	Num_Supported_Standard_Codecs = TSPX_Number_Supported_Standard_Codecs_BR_EDR Standard_Codec_ID[Num_Supported_Standard_Codecs] Num_Supported_Vendor_Specific_Codecs = TSPX_Number_Supported_Vendor_Codecs_BR_EDR Vendor_Specific_Codec_ID[Num_Supported_Vendor_Specified_Codecs]	No
HCI/CIN/BV-11-C [Read Local Supported Codec Capabilities, All]	HCI_Read_Local_Supported_Codecs [v2]	Num_Supported_Standard_Codecs = TSPX_Number_Supported_Standard_Codecs_All_PHYs Standard_Codec_ID[Num_Supported_Standard_Codecs] Standard_Codec_Transport[Num_Supported_Standard_Codecs] Num_Supported_Vendor_Specific_Codecs = TSPX_Number_Supported_Vendor_Codecs_All_PHYs Vendor_Specific_Codec_ID[Num_Supported_Vendor_Specified_Codecs] Vendor_Specific_Codec_Transport[Num_Supported_Vendor_Specified_Codecs]	Yes

Table 4.12: Read Local Supported Codec Capabilities test cases

- Test Procedure

1. The Upper Tester sends the HCI command as specified in [Table 4.12](#) to the IUT.
2. The IUT responds with a successful HCI_Command_Complete event with return parameters as specified in [Table 4.12](#).
3. The Upper Tester verifies that the IUT returns the Codec Parameters specified in [Table 4.11](#) with Num_Codec_Capabilities entries. The Upper Tester also verifies that the number of array elements matches the number of supported codecs.
4. If the returned Num_Supported_Standard_Codecs and Num_Supported_Vendor_Specific_Codecs both equal zero, the test ends with a Pass verdict.
5. For each standard codec and each vendor-specific codec returned in Step 2, perform Steps 6–13.
6. For each transport supported for that codec as specified in the parameters returned in Step 2, perform Steps 7–13.
7. For the two directions 0x00 and 0x01, perform Steps 8–12.
8. The Upper Tester sends an HCI_Read_Local_Supported_Codec_Capabilities command to the IUT with the appropriate Codec_ID, Logical_Transport_Type, and Direction.
9. The IUT sends an HCI_Command_Complete event to the Upper Tester. If the status is zero, perform Steps 10–12; otherwise, skip those steps.
10. For each codec capability returned in Step 9, perform Steps 11 and 12.
11. The Upper Tester sends an HCI_Read_Local_Supported_Controller_Delay command to the IUT with Codec_ID, Logical_Transport_Type, and Direction set to the values used in Step 8 and Codec_Configuration_Length and Codec_Configuration set to the values selected in Step 10.
12. The IUT responds with a successful HCI_Command_Complete event with Min_Controller_Delay and Max_Controller_Delay set to a value between 0x000000 and 0x3D0900 and $\text{Max_Controller_Delay} \geq \text{Min_Controller_Delay}$.
13. If for both directions the status in Step 9 is non-zero, the test ends with a Fail verdict.

- Expected Outcome

Pass verdict

In Step 2, the IUT responds with return parameters as specified in [Table 4.12](#).

In Step 3, the IUT sends the correct number of Codec IDs and Codec Transports.

In Step 12, the IUT responds with return parameters with valid Min_Controller_Delay and Max_Controller_Delay values.

Fail verdict

The status returned in Step 9 is non-zero for both directions for the same codec and transport.

HCI/CIN/BV-12-C [LE Read Local Supported Features Page 0 Command]

- Test Purpose

Verify that the LE_Read_Local_Supported_Features_Page_0 command returns with the correct features supported.

- Reference

[\[1\]](#) 7.8.3

- Initial Condition

- The IUT is not connected to the Lower Tester.

- Test Procedure

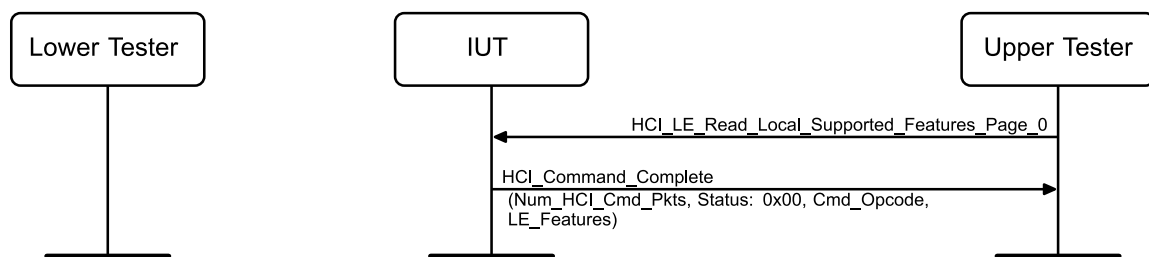


Figure 4.22: HCI/CIN/BV-12-C [LE Read Local Supported Features Page 0 Command] MSC

- Expected Outcome

Pass verdict

The Features field in the HCI_Command_Complete event is set to a value containing all the features supported, matching those defined by the LL ICS as mapped by Table 2.1 in [\[20\]](#).

HCI/CIN/BV-15-C [LE Read All Local Supported Features Command]

- Test Purpose

Verify that the LE_Read_All_Local_Supported_Features command returns with the correct features supported.

- Reference

[\[1\]](#) 7.8.129

- Initial Condition
 - The IUT is not connected to the Lower Tester.
- Test Procedure

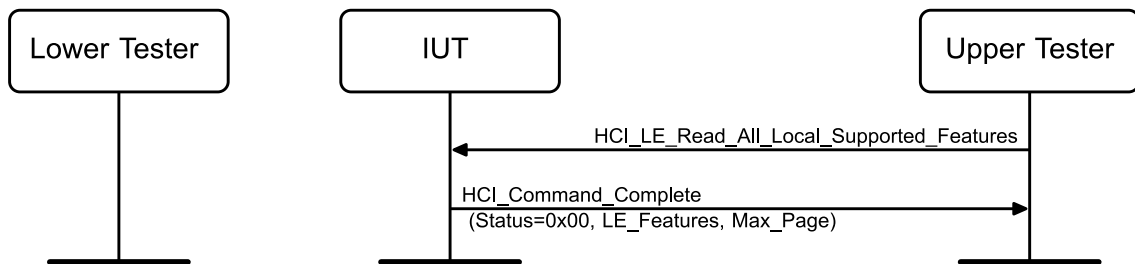


Figure 4.23: HCI/CIN/BV-15-C [LE Read All Local Supported Features Command] MSC

- The Upper Tester sends an HCI_LE_Read_All_Local_Supported_Features command to the IUT.
- The IUT sends a successful HCI_Command_Complete event to the Upper Tester with Max_Page and LE_Features set.

- Expected Outcome

Pass verdict

In Step 2, the LE_Features field is set to a value matching the corresponding ICS entries as mapped by Table 2.1 in [20]. Max_Page is set to the highest-numbered page with at least one bit set.

4.6.3 Read RSSI Value

- Test Purpose

Verify that the Read RSSI command returns a valid Received Signal Strength Indication value for a given connection.

- Reference

[12] 7.5.4

- Initial Condition

- ACL connection established, the IUT is Central or Peripheral.

- Test Case Configuration

Test Case ID	PHY
HCI/CIN/BV-13-C	BR/EDR
HCI/CIN/BV-14-C	LE PHY

Table 4.13: Read RSSI Value test cases

- Test Procedure

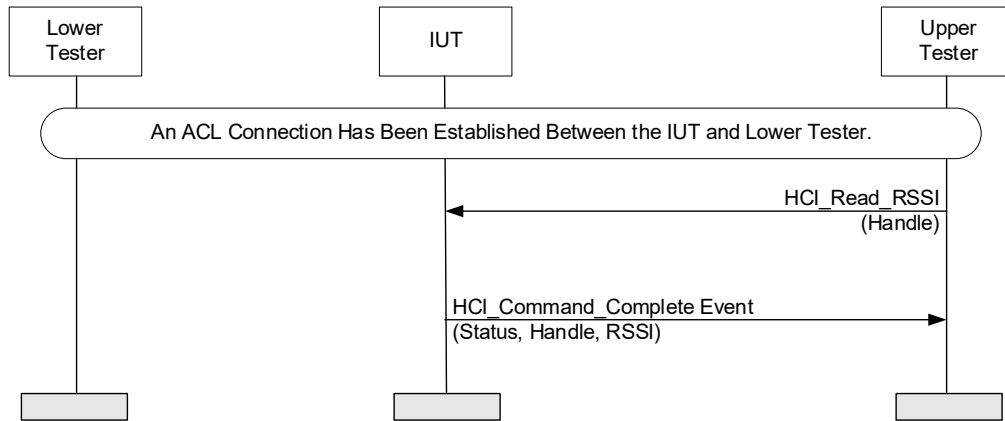


Figure 4.24: Read RSSI Value MSC

1. The Upper Tester sends an `HCI_Read_RSSI` command to the IUT with Handle set to the value of the `Connection_Handle` of the current connection.
2. The IUT sends a successful `HCI_Command_Complete` event to the Upper Tester with Handle set to the value of the `Connection_Handle` in Step 1 and a valid RSSI value.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an `HCI_Command_Complete` event to the Upper Tester with Status set to 0x00, Handle set to the `Connection_Handle` in Step 1, and a valid RSSI value.

4.7 Device Discovery

Verify the correct implementation of the Device Discovery commands.

HCI/DDI/BV-01-C [Periodic Inquiry Mode Command]

- Test Purpose

Verify that the Periodic Inquiry Mode command configures the IUT to enter the Periodic Inquiry Mode, and that the Exit Periodic Inquiry Mode command configures the IUT to exit Periodic Inquiry Mode.

- Reference

[1] 7.1.3, 7.1.4

- Initial Condition

- The IUT must be configured as Central.
- The IUT is in STANDBY mode.

- Test Procedure

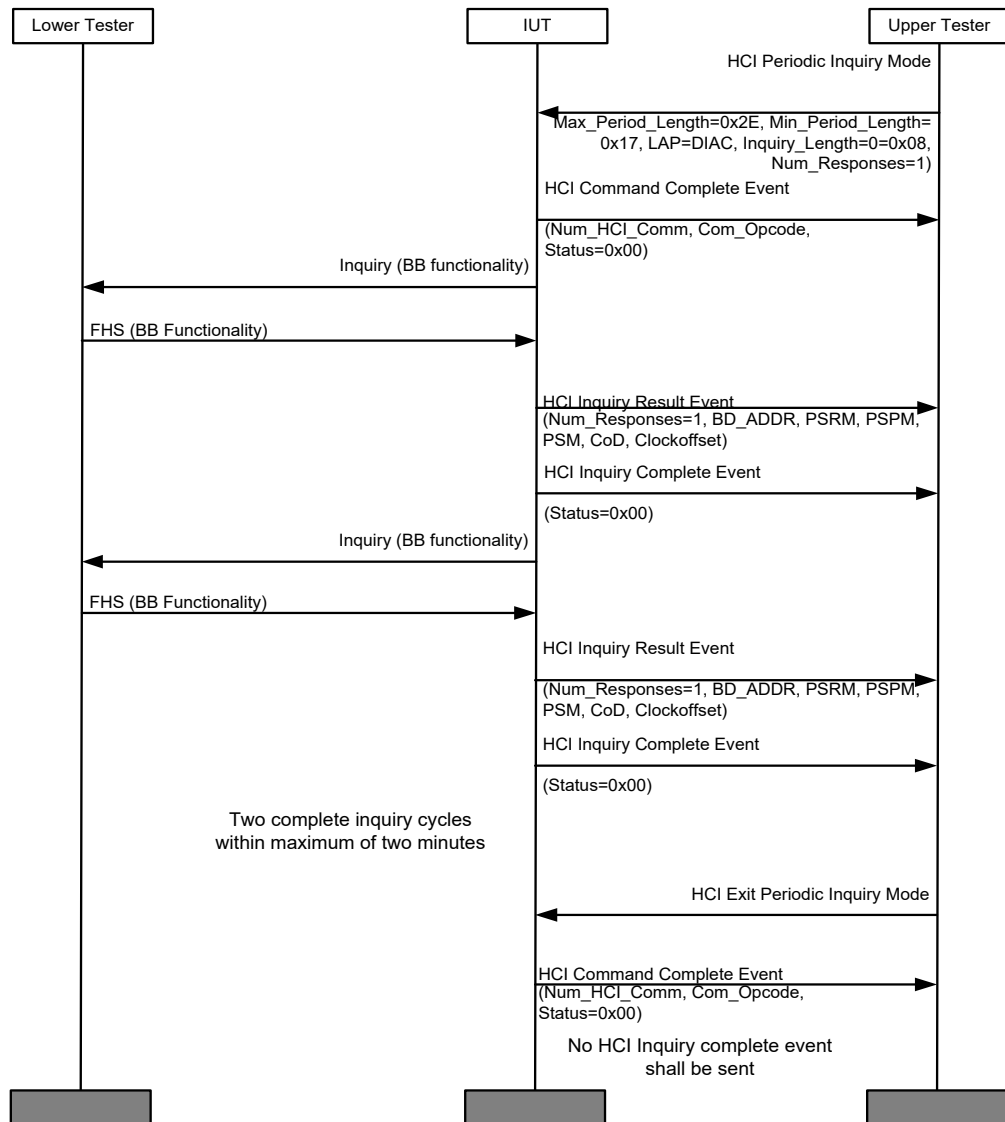


Figure 4.25: HCI/DDI/BV-01-C [Periodic Inquiry Mode Command] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Periodic Inquiry Mode command.

The IUT returns an 'Inquiry Result' during each inquiry period.

The IUT returns an 'Inquiry Complete' event at the end of each inquiry period.

The IUT returns 'command complete' succeeded to the Exit Periodic Inquiry Mode command.

The IUT does not return an Inquiry Complete event after the periodic inquiry is exited.

HCI/DDI/BV-02-C [Write Inquiry Mode Command]

- Test Purpose

Verify that the Write Inquiry Mode command writes the Inquiry Mode configuration parameter of the IUT, and that Read Inquiry Mode command returns the Inquiry Mode configuration parameter of the IUT.

- Reference

[1] 7.3.53, 7.3.54

- Initial Condition

- The IUT must be configured as Central.
- The IUT is in STANDBY mode.

- Test Procedure

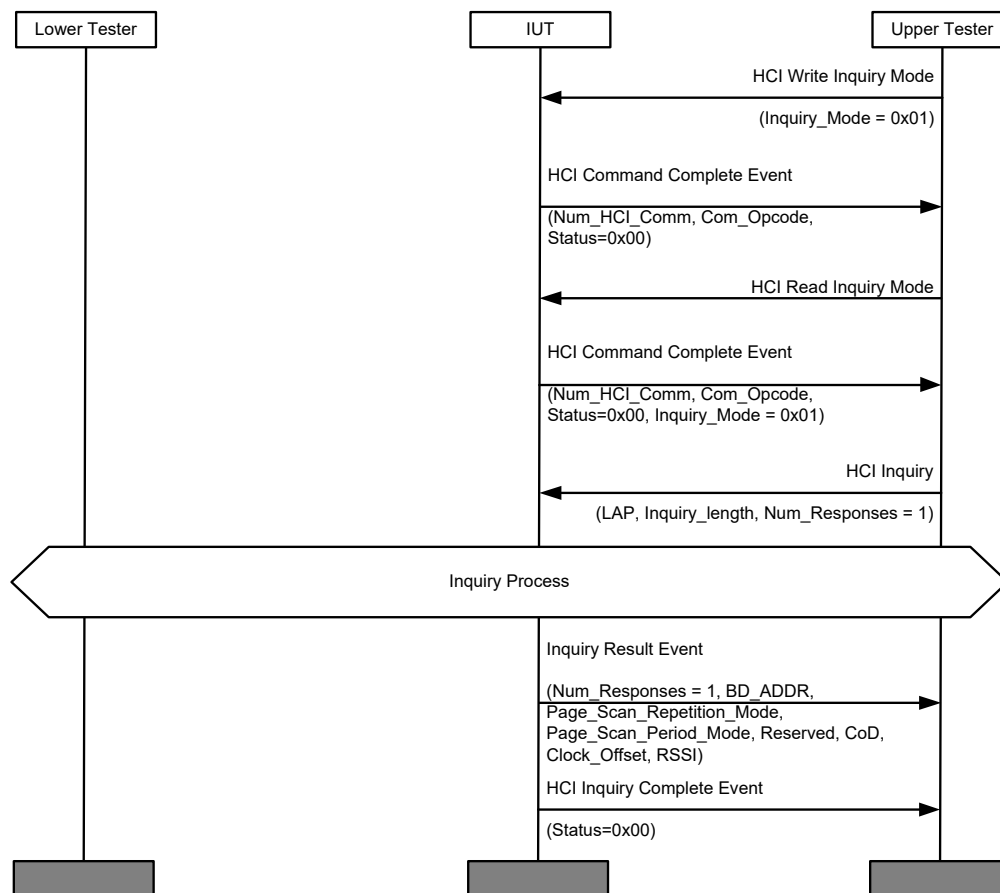


Figure 4.26: HCI/DDI/BV-02-C [Write Inquiry Mode Command] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Write Inquiry Mode command.

The IUT returns the Inquiry_Mode parameter with result 'Inquiry Result format with RSSI'. The IUT returns an inquiry result with RSSI.

HCI/DDI/BV-03-C [Set Advertising Enable]

- Test Purpose

Verify that the IUT stops advertising when receiving HCI LE SetAdvertising Enable with the parameter Advertising Enable set to Disabled.

- Reference

[8] 7.8.10

- Initial Condition

- The IUT is configured in the advertising state.

- Test Procedure

The Lower Tester receives ADV_IND packets from the IUT.

The Upper Tester sends HCI LE SetAdvertising Enable with parameter Advertising Enable set to Disabled to the IUT and receives the HCI_Command_Complete event with Status = Success.

The Lower Tester receives no ADV_IND packets from the IUT.

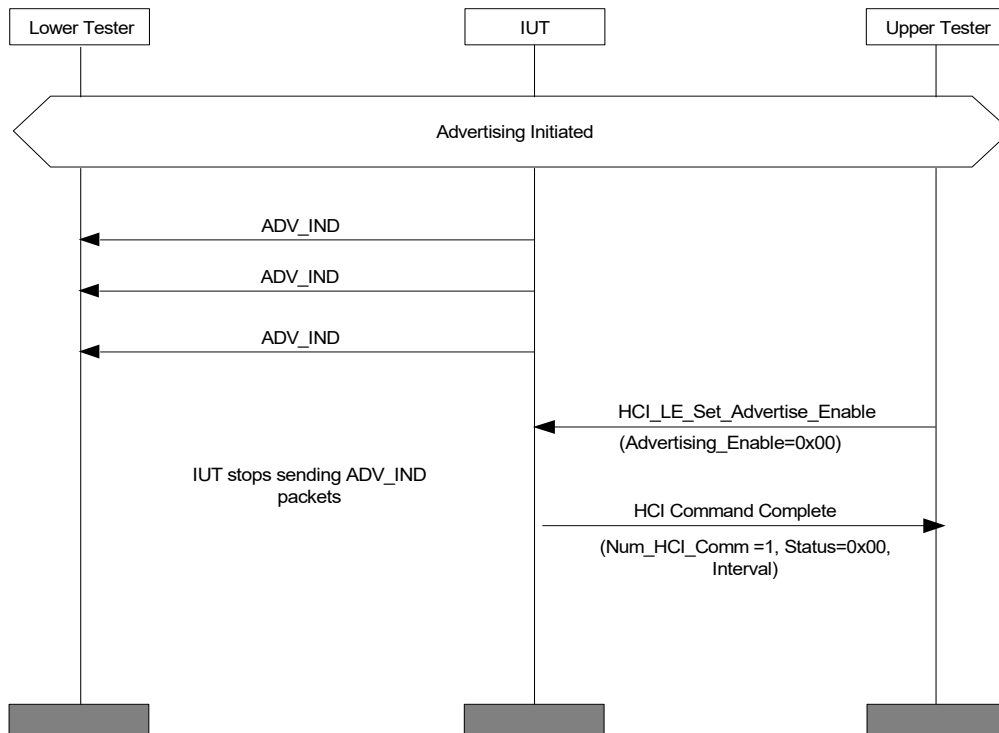


Figure 4.27: HCI/DDI/BV-03-C [Set Advertising Enable] MSC

- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success.

The IUT stops sending ADV_IND packets.

HCI/DDI/BV-04-C [Set Scan Enable]

- Test Purpose

Verify that the IUT stops scanning when receiving HCI LE SetScan Enable with the parameter LE Scan Enable set to Disabled.

- Reference

[8] 7.8.12

- Initial Condition

- The IUT is configured as passive scanner. The Lower Tester is advertiser.

- Test Procedure

The Upper Tester receives HCI LE Advertising Report Event from the IUT.

The Upper Tester sends HCI LE SetScan Enable with LE Scan Enable parameter set to Disabled to the IUT and receives the HCI_Command_Complete event with Status = Success.

The Upper Tester receives no more HCI LE Advertising Report Events from the IUT.

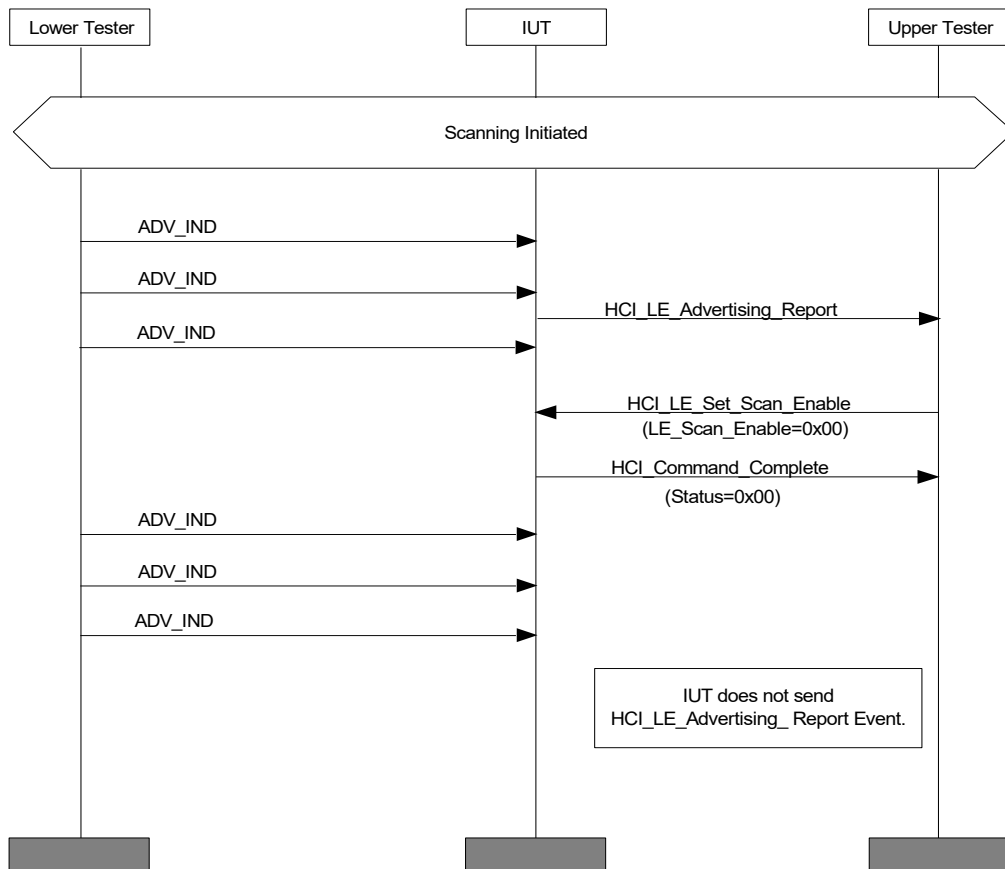


Figure 4.28: HCI/DDI/BV-04-C [Set Scan Enable] MSC

- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success.

The IUT does not send any more LE Advertising Report Events after it sends the HCI_Command_Complete for the HCI_LE_Set_Scan_Enable command that disables scanning.

HCI/DDI/BV-05-C [Read Extended Inquiry Length]

- Test Purpose

Verify that the IUT correctly handles Read Extended Inquiry Length.

- Reference

[1] 7.3.98

- Initial Condition

- The IUT is in standby.

- Test Procedure

1. The Upper Tester issues HCI_Write_Extended_Inquiry_Length Command with preset information to the IUT.
2. The Upper Tester receives success status in the HCI_Write_Extended_Inquiry_Length Command complete event.
3. The Upper Tester issues HCI_Read_Extended_Inquiry_Length Command to the IUT.

- Expected Outcome

Pass verdict

The Upper Tester receives command complete event with success status for the commands sent in a and c. The Upper Tester receives the data returned by the HCI_Read_Extended_Inquiry_Length Command complete event. The received data matches that was used in the HCI_Write_Extended_Inquiry_Length Command.

HCI/DDI/BI-01-C [Reject Invalid Extended Advertising Parameters]

- Test Purpose

Verify that the IUT properly rejects an invalid advertising interval provided to the HCI_LE_Set_Extended_Advertising_Parameters command and returns the expected error code.

- Reference

[9] 7.8.53

- Initial Condition

- The IUT is not currently advertising.
- The minimum Primary_Advertising_Interval_Min value (TSPX_adv_interval_min) supported by the Controller is declared by the equipment manufacturer as an IXIT value.
- The maximum Primary_Advertising_Interval_Max value (TSPX_adv_interval_max) supported by the Controller is declared by the equipment manufacturer as an IXIT value.
- The legacy advertising type is defined by the TSPX_legacy_advertising_event_properties IXIT value.

- Test Procedure

The Upper Tester sends the HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Advertising_Event_Properties parameter set to TSPX_legacy_advertising_event_properties, the Primary_Advertising_Interval_Max field set to TSPX_adv_interval_min minus one, and Primary_Advertising_Interval_Min set to TSPX_adv_interval_min minus two.

If the TSPX_adv_interval_max value is 0xFFFFFFFF, the test ends immediately with a Pass verdict. Otherwise, the Upper Tester sends the HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Advertising_Event_Properties parameter set to TSPX_legacy_advertising_event_properties, the Primary_Advertising_Interval_Min field set to TSPX_adv_interval_max plus one, and Primary_Advertising_Interval_Max set to TSPX_adv_interval_max plus one if TSPX_adv_interval_max equals 0xFFFFFE, and plus two otherwise.

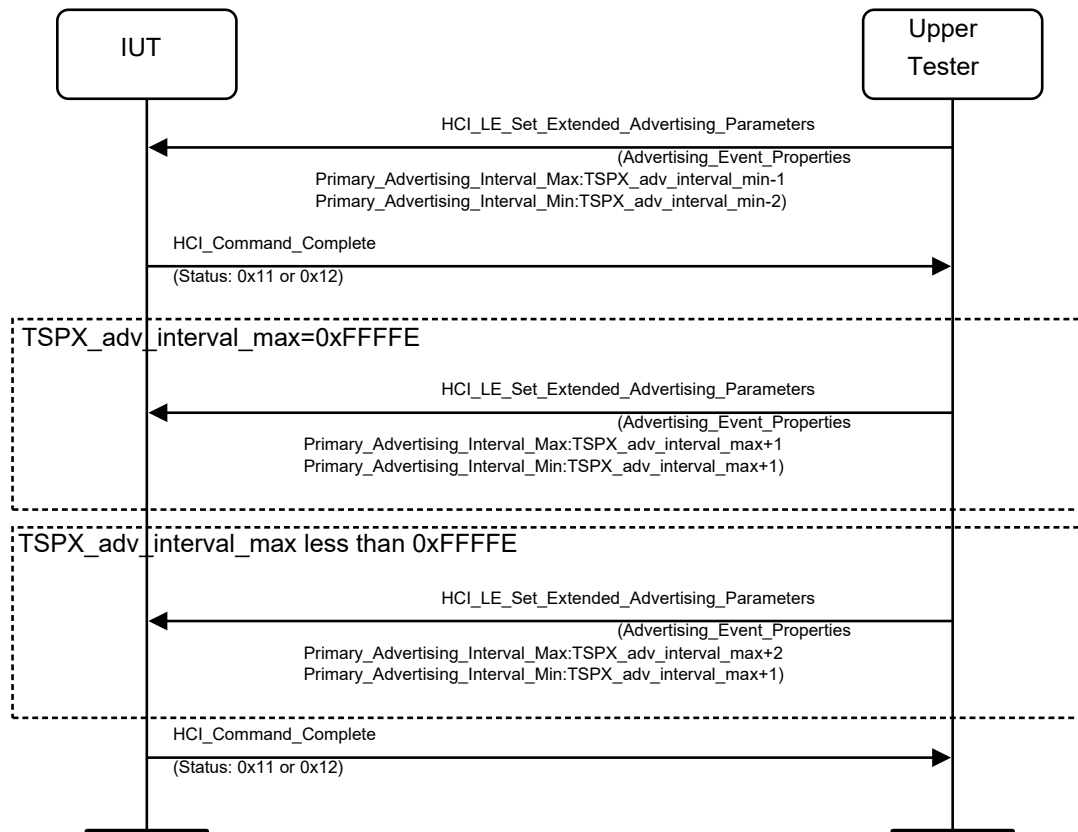


Figure 4.29: HCI/DDI/BI-01-C [Reject Invalid Extended Advertising Parameters] MSC

- Expected Outcome

Pass verdict

HCI_Command_Complete event for HCI_LE_Set_Extended_Advertising_Parameters is received by the Upper Tester.

- If either Primary_Advertising_Interval_Min or Max is less than 0x000020, the error code is either 0x11 (Unsupported Feature or Parameter Value) or 0x12 (Invalid HCI Command Parameter). Otherwise, the error code is 0x11.

HCI/DDI/BI-02-C [Reject Invalid Advertising Parameters]

- Test Purpose

Verify that the IUT properly rejects an invalid advertising interval provided to the HCI_LE_Set_Advertising_Parameters command and returns the expected error code.

- Reference

[9] 7.8.5

- Initial Condition

- The IUT is not currently advertising.
- The minimum Advertising_Interval_Min value (TSPX_adv_interval_min) supported by the Controller is declared by the equipment manufacturer as an IXIT value.
- The maximum Advertising_Interval_Max value (TSPX_adv_interval_max) supported by the Controller is declared by the equipment manufacturer as an IXIT value.

- Test Procedure

The Upper Tester sends the HCI_LE_Set_Advertising_Parameters to the IUT with the Advertising_Type field set to 0x03 (ADV_NONCONN_IND), the Advertising_Interval_Max field set to TSPX_adv_interval_min minus one, and Advertising_Interval_Min set to TSPX_adv_interval_min minus two.

The Upper Tester sends the HCI_LE_Set_Advertising_Parameters to the IUT with the Advertising_Type field set to 0x03 (ADV_NONCONN_IND), the Advertising_Interval_Max field set to TSPX_adv_interval_max plus two, and Advertising_Interval_Max set to TSPX_adv_interval_max plus one.

- Expected Outcome

Pass verdict

- HCI_Command_Complete event for HCI_LE_Set_Advertising_Parameters is received by the Upper Tester.
- If either Advertising_Interval_Min or Advertising_Interval_Max or both are less than 0x0020 or greater than 0x4000, the error code is either 0x11 (Unsupported Feature or Parameter Value) or 0x12 (Invalid HCI Command Parameter). Otherwise, the error code is 0x11.

HCI/DDI/BI-67-C [Reject Invalid Periodic Advertising Parameters]

- Test Purpose

Verify that the IUT properly rejects an invalid periodic advertising interval provided to the HCI_LE_Set_Periodic_Advertising_Parameters command and returns the expected error code.

- Reference

[9] 7.8.61

- Initial Condition
 - The IUT does not have periodic advertising enabled. An advertising set is configured with supported default values using the HCI_LE_Set_Extended_Advertising_Parameters.
 - The minimum Periodic_Advertising_Interval_Min value (TSPX_periodic_adv_interval_min) supported by the Controller is declared by the equipment manufacturer as an IXIT value.
 - The maximum Periodic_Advertising_Interval_Max value (TSPX_periodic_adv_interval_max) supported by the Controller is declared by the equipment manufacturer as an IXIT value.

- Test Procedure

The Upper Tester sends the HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Periodic_Advertising_Interval_Max set to TSPX_periodic_adv_interval_min minus one, and Periodic_Advertising_interval_Min set to TSPX_periodic_adv_interval_min minus two.

If the TSPX_periodic_adv_interval_max value is 0xFFFF, the test ends immediately with a Pass verdict. Otherwise, the Upper Tester sends the HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Periodic_Advertising_Interval_Min set to TSPX_periodic_adv_interval_max plus one, and Periodic_Advertising_interval_Max set to TSPX_periodic_adv_interval_max plus one if TSPX_periodic_adv_interval_max equals 0xFFFE, and plus two otherwise.

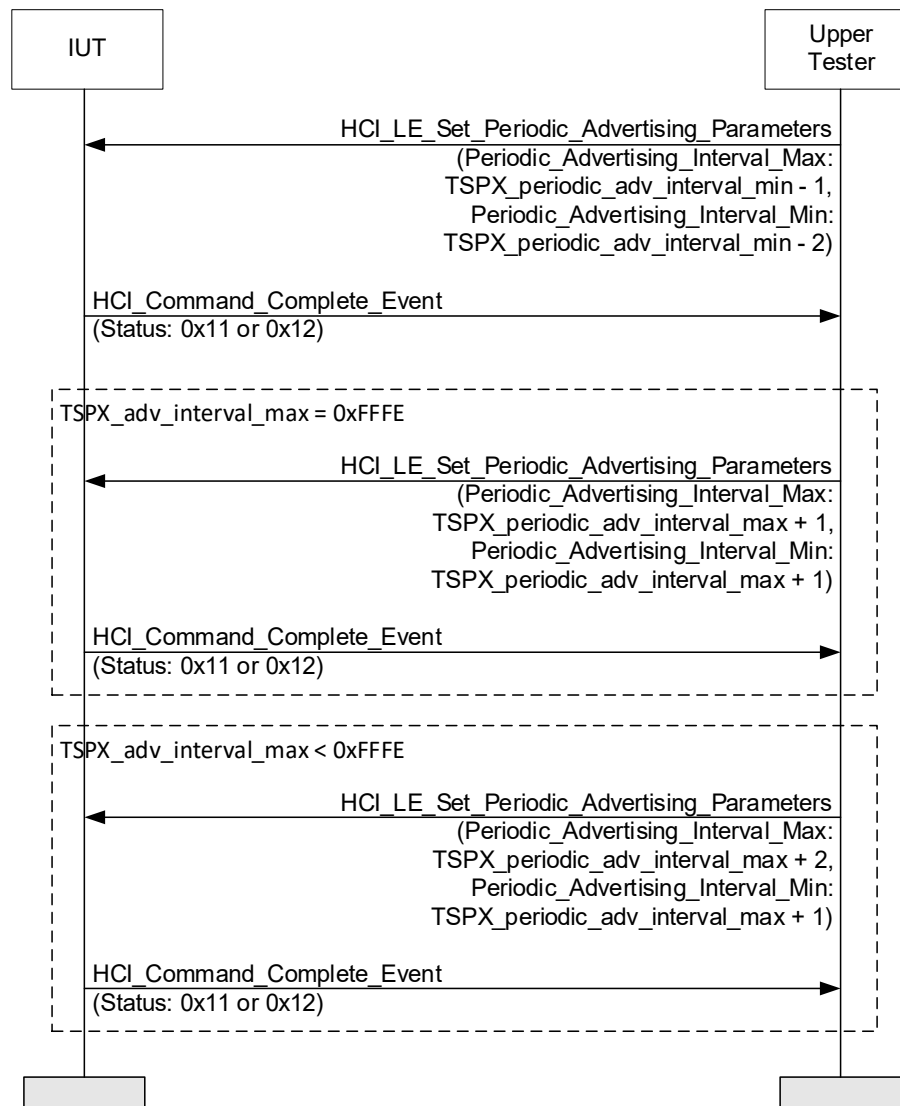


Figure 4.30: HCI/DDI/BI-67-C [Reject Invalid Periodic Advertising Parameters] MSC

- Expected Outcome

Pass verdict

The HCI_Command_Complete event for HCI_LE_Set_Periodic_Advertising_Parameters is received by the Upper Tester.

If either Primary_Advertising_Interval_Min or Max is less than 0x0006, the error code is either 0x11 (Unsupported Feature or Parameter Value) or 0x12 (Invalid HCI Command Parameter). Otherwise, the error code is 0x11.

HCI/DDI/BI-03-C [Reject LE Periodic Advertising Create Sync Command With Disallowed Reporting Options]

- Test Purpose

Verify that the IUT properly rejects disallowed reporting options provided to the HCI_LE_Periodic_Advertising_Create_Sync command and returns the expected error code.

- Reference

[11] 7.8.67

- Initial Condition

- The Lower Tester is advertising with extended advertising and periodic advertising.
- The IUT is scanning for extended advertising and has received the Advertising SID, Advertiser Address Type, and Advertiser Address.

- Test Procedure

The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's periodic advertisements. Options is set to 0x02 (Don't Use List, Reporting Disabled).

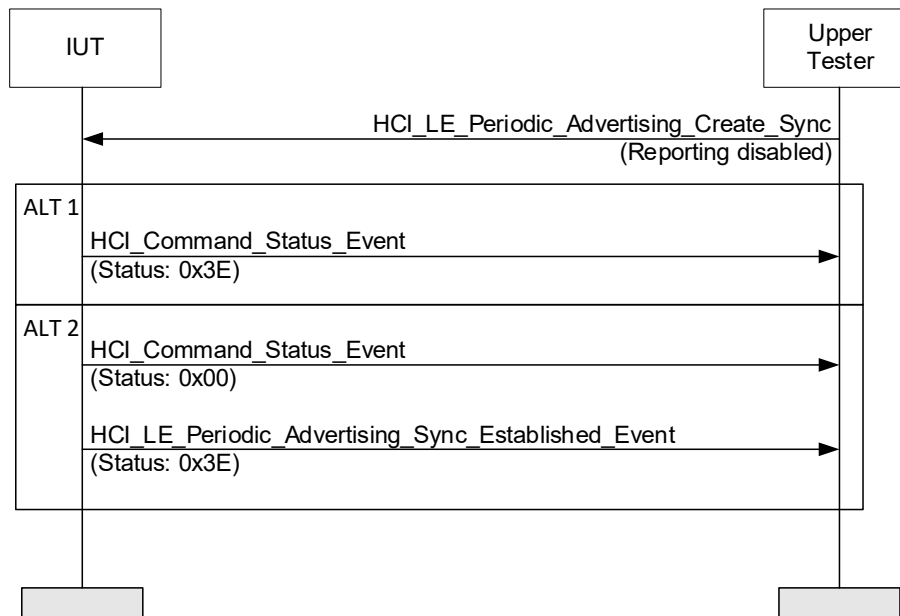


Figure 4.31: HCI/DDI/BI-03-C [Reject LE Periodic Advertising Create Sync Command With Disallowed Reporting Options] MSC

- Expected Outcome

Pass verdict

Alternative 1:

A Command Status event for the `HCI_LE_Periodic_Advertising_Create_Sync` command is received by the Upper Tester with the Connection Failed to be Established / Synchronization Timeout (0x3E) error code.

Alternative 2:

An LE Periodic Advertising Sync Established event is received by the Upper Tester with the Connection Failed to be Established / Synchronization Timeout (0x3E) error code.

HCI/DDI/BI-04-C [Reject LE Periodic Advertising Create Sync Command to a Synchronized Advertising Set]

- Test Purpose

Verify that the IUT properly rejects setting a periodic advertising that the Controller is already synchronized to, to the HCI_LE_Periodic_Advertising_Create_Sync command and returns the expected error code.

- Reference

[12] 7.8.67

- Initial Condition

- The Lower Tester is advertising with three periodic advertisements. All three have the same Advertising Address and Advertising Address Type. The first and third periodic advertisements have the same SID while the second has a different SID.
- The IUT is scanning for extended advertising and is receiving SyncInfo for all three advertisements.

- Test Procedure

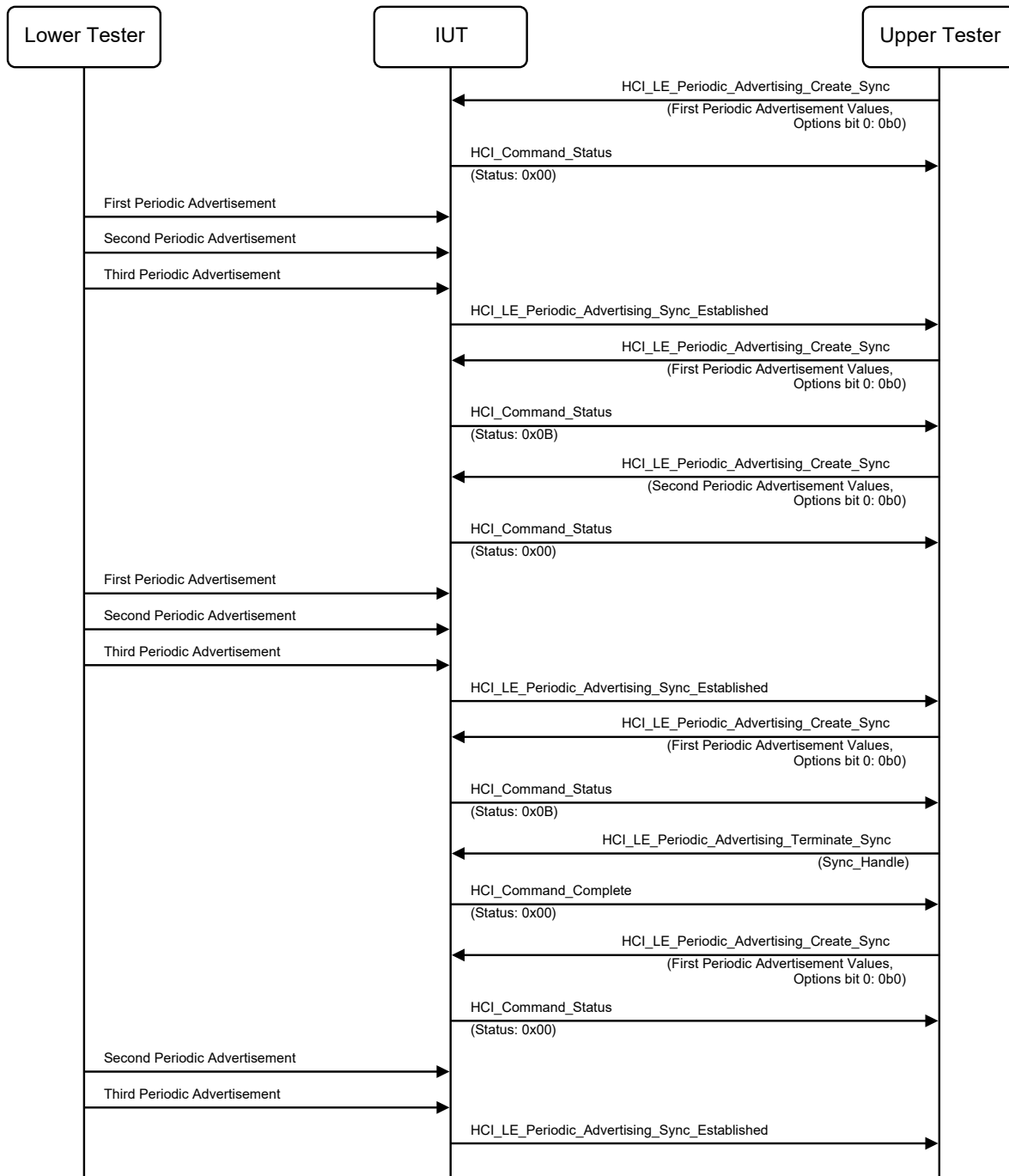


Figure 4.32: HCI/DDI/BI-04-C [Reject LE Periodic Advertising Create Sync Command to a Synchronized Advertising Set] MSC

1. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's first periodic advertisement values and with bit 0 of the Options parameter set to 0.
2. An HCI_Command_Status event for the HCI_LE_Periodic_Advertising_Create_Sync command is received by the Upper Tester with a Success (0x00) error code.
3. The Upper Tester waits for the HCI_LE_Periodic_Advertising_Sync_Established event.

4. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's first periodic advertisement values and with bit 0 of the Options parameter set to 0.
5. An HCI_Command_Status event for the HCI_LE_Periodic_Advertising_Create_Sync command is received by the Upper Tester with the Connection Already Exists (0x0B) error code.
6. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's second periodic advertisement values and with bit 0 of the Options parameter set to 0.
7. An HCI_Command_Status event for the HCI_LE_Periodic_Advertising_Create_Sync command is received by the Upper Tester with a Success (0x00) error code. An error code of Memory Capacity Exceeded (0x07) results in an Inconclusive verdict.
8. The Upper Tester waits for the HCI_LE_Periodic_Advertising_Sync_Established event. An error code of Memory Capacity Exceeded (0x07) results in an Inconclusive verdict.
9. The Lower Tester stops the first periodic advertisement while continuing the other two periodic advertisements.
10. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's first periodic advertisement values and with bit 0 of the Options parameter set to 0.
11. An HCI_Command_Status event for the HCI_LE_Periodic_Advertising_Create_Sync command is received by the Upper Tester with the Connection Already Exists (0x0B) or Memory Capacity Exceeded (0x07) error code.
12. The Upper Tester sends an HCI_LE_Periodic_Advertising_Terminate_Sync command to the IUT with the Sync_Handle received in the HCI_LE_Periodic_Advertising_Sync_Established event for the First Periodic Advertisement in Step 3.
13. An HCI_Command_Complete event for the HCI_LE_Periodic_Advertising_Terminate_Sync command is received by the Upper Tester with a Success (0x00) error code.
14. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's first periodic advertisement values and with bit 0 of the Options parameter set to 0.
15. An HCI_Command_Status event for the HCI_LE_Periodic_Advertising_Create_Sync command is received by the Upper Tester with a Success (0x00) error code. An error code of Memory Capacity Exceeded (0x07) results in an Inconclusive verdict.
16. The Upper Tester waits for the HCI_LE_Periodic_Advertising_Sync_Established event. An error code of Memory Capacity Exceeded (0x07) results in an Inconclusive verdict.

- Expected Outcome

Pass verdict

The Upper Tester receives an HCI_Command_Status event with the expected status for each command.

The Upper Tester receives HCI_LE_Periodic_Advertising_Sync_Established events as expected for each HCI_LE_Periodic_Advertising_Create_Sync command that returned a status of success.

Inconclusive verdict

In Steps 7, 8, 15, or 16, the Memory Capacity Exceeded (0x07) error is returned.

HCI/DDI/BI-05-C [LE Set Extended Scan Parameters With Unsupported PHY]

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Extended_Scan_Parameters command that specifies unsupported PHYs.

- Reference

[9] 7.8.64

- Initial Condition

- The IUT is not currently scanning.

- Test Procedure

For each bit on the Scanning_PHYs parameter of the HCI_LE_Set_Extended_Scan_Parameters command that is an RFU bit or corresponds to a PHY not supported by the IUT:

The Upper Tester sends an HCI_LE_Set_Extended_Scan_Parameters command to the IUT with Scanning_PHYs having only that bit set and receives an HCI_Command_Complete event with a non-zero status.

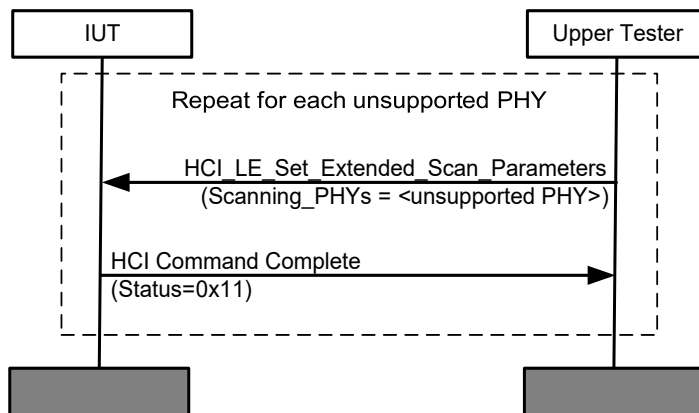


Figure 4.33: HCI/DDI/BI-05-C [LE Set Extended Scan Parameters With Unsupported PHY] MSC

- Expected Outcome

If the IUT supports PHYs corresponding to all 8 bits of the Scanning_PHYs parameter, the test procedure will do nothing. This case is a Pass.

Pass verdict

For each unsupported PHY (if applicable) and HCI_LE_Set_Extended_Scan_Parameters command with an RFU bit set, a Command Complete event for HCI_LE_Set_Extended_Scan_Parameters is received by the Upper Tester with the error Code Unsupported Feature or Parameter Value (0x11).

4.7.1 Reject Invalid Enable Command

- Test Purpose

Verify that the IUT properly rejects an enable command when the LE Random Device Address is unset, and returns the expected error code.

- Initial Condition
 - The IUT is in standby.
 - The IUT has not set its LE Random Device Address.
- Test Procedure

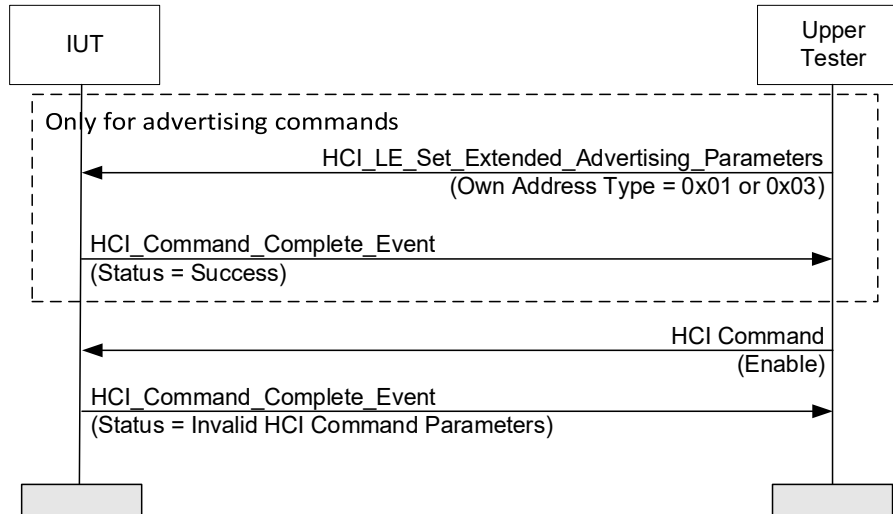


Figure 4.34: Reject Invalid Enable Command MSC

- The Upper Tester sets the Own_Address_Type using the command and parameter in the “HCI Set Command and Parameter” column in [Table 4.14](#). Set all other fields to valid values.
- The IUT returns an HCI_Command_Complete event with Success (0x00).
- Upper Test sends the HCI Command under test from [Table 4.14](#) with the “Enable Parameter” set to 0x1 and with any other parameters set to valid values.
- The IUT returns an HCI_Command_Complete event with the error code Invalid HCI Command Parameters (0x12).

Test Case	HCI Set Command and Parameter	HCI Command and Parameter
HCI/DDI/BI-06-C [9] 7.8.9	HCI_LE_Set_Advertising_Parameters (0x03)	HCI_LE_Set_Advertising_Enable (Advertising_Enable)
HCI/DDI/BI-07-C [9] 7.8.11	HCI_LE_Set_Scan_Parameters (0x01 or 0x03)	HCI_LE_Set_Scan_Enable (LE_Scan_Enable)
HCI/DDI/BI-08-C [9] 7.8.56	HCI_LE_Set_Extended_Advertising_Parameters (0x01)	HCI_LE_Set_Extended_Advertising_Enable (Enable)
HCI/DDI/BI-09-C [9] 7.8.56	HCI_LE_Set_Extended_Advertising_Parameters (0x03)	HCI_LE_Set_Extended_Advertising_Enable (Enable)
HCI/DDI/BI-11-C [9] 7.8.65	HCI_LE_Set_Extended_Scan_Parameters (0x01 or 0x03)	HCI_LE_Set_Extended_Scan_Enable (Enable)

Table 4.14: Reject Invalid Enable Command test cases

- Expected Outcome

Pass verdict

The IUT generates a Command Complete event for the HCI command under test with a status of Invalid HCI Command Parameters (0x12).

HCI/DDI/BI-12-C [Reject Invalid Extended Advertising Enable Command]

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Extended_Advertising_Enable command when the IUT is not properly configured, and returns the expected error code.

- Reference

[9] 7.8.56

- Initial Condition

- The IUT is in standby.
- Extended advertising parameters with the scannable property set have been configured on the IUT for a particular advertising handle, but no scan response data has been set for that handle.

- Test Procedure

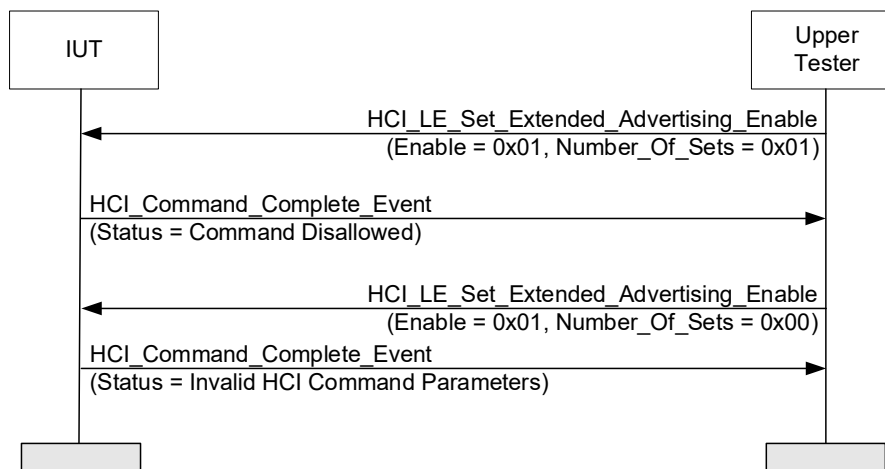


Figure 4.35: HCI/DDI/BI-12-C [Reject Invalid Extended Advertising Enable Command] MSC

1. The Upper Tester sends the HCI_LE_Set_Extended_Advertising_Enable command with the Enable parameter set to 0x01, the Advertising_Handle set to existing Advertising_Handle, Number_Of_Sets set to 0x01, and with all other parameters set to valid values.
2. The IUT returns an HCI_Command_Complete event with the error code Command Disallowed (0x0C).
3. The Upper Tester sends the HCI_LE_Set_Extended_Advertising_Enable command with the Enable parameter set to 0x01, the Advertising_Handle set to existing Advertising_Handle, Number_Of_Sets set to 0x00, and with all other parameters set to valid values.
4. The IUT returns an HCI_Command_Complete event with the error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

The IUT generates a Command Complete event for each HCI_LE_Set_Extended_Advertising_Enable command with the expected error code.

HCI/DDI/BI-13-C [Reject Invalid Periodic Advertising Enable Command]

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Periodic_Advertising_Enable command when the IUT is not properly set up, and returns the expected error code.

- Reference

[9] 7.8.63

- Initial Condition

- The IUT is in standby.
- Extended advertising parameters and periodic advertising parameters have been configured on the IUT for a particular advertising handle.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command with Operation parameter set to 0x01 and a non-zero Advertising_Data_Length.
2. The IUT returns an HCI_Command_Complete event with status set to 0x00.
3. The Upper Test sends an HCI_LE_Set_Periodic_Advertising_Enable with the Enable parameter set to 0x01, the Advertising_Handle set to the existing Advertising_Handle.
4. The IUT returns an HCI_Command_Complete event with the error code Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

The IUT generates a Command Complete event for the HCI_LE_Set_Periodic_Advertising_Enable command with the expected error code.

HCI/DDI/BI-14-C [Reject LE Set Periodic Advertising Data setting the fragment when periodic advertising is enabled]

- Test Purpose

Verify that the IUT properly rejects the Upper Tester attempting to set the data fragment when periodic advertising is already enabled.

- Reference

[13] 7.8.62

- Initial Condition

- The IUT is advertising with periodic advertisements.

- Test Case Configuration

Round	Operation
1	0x00
2	0x01
3	0x02

Table 4.15: HCI/DDI/BI-14-C [Reject LE Set Periodic Advertising Data setting the fragment when periodic advertising is enabled] rounds

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Operation set to the value specified in Table 4.15.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with the error code Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an HCI_Command_Complete event with the Command Disallowed (0x0C) error code.

4.7.2 Reject Set Extended Advertising Parameters Command using a Periodic Advertising Set and Incompatible Advertising is Specified

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Extended_Advertising_Parameters command when periodic advertising is enabled for the specified advertising set, and scannable, connectable, legacy, or anonymous advertising is specified.

- Reference

[12] 7.8.53

- Initial Condition

- An advertising set exists and is no greater than 0x1F in length.

- Test Case Configuration

Test Case	Specified Advertising Type	Advertising_Event_Properties
HCI/DDI/BI-15-C	Non-connectable non-scannable anonymous undirected	0b00100000
HCI/DDI/BI-16-C	Non-connectable non-scannable anonymous directed	0b00100100
HCI/DDI/BI-17-C	Legacy connectable and scannable undirected	0b00010011
HCI/DDI/BI-18-C	Legacy connectable directed (low duty cycle)	0b00010101
HCI/DDI/BI-19-C	Legacy connectable directed (high duty cycle)	0b00011101
HCI/DDI/BI-20-C	Legacy scannable undirected	0b00010010

Test Case	Specified Advertising Type	Advertising_Event_Properties
HCI/DDI/BI-21-C	Legacy non-connectable and non-scannable, undirected	0b00010000
HCI/DDI/BI-22-C	Extended connectable undirected	0b00000001
HCI/DDI/BI-23-C	Extended connectable directed	0b00000101
HCI/DDI/BI-24-C	Extended scannable undirected	0b00000010
HCI/DDI/BI-25-C	Extended scannable directed	0b00000110

Table 4.16: Reject Set Extended Advertising Parameters Command using a Periodic Advertising Set and Incompatible Advertising is Specified test cases

- Test Procedure

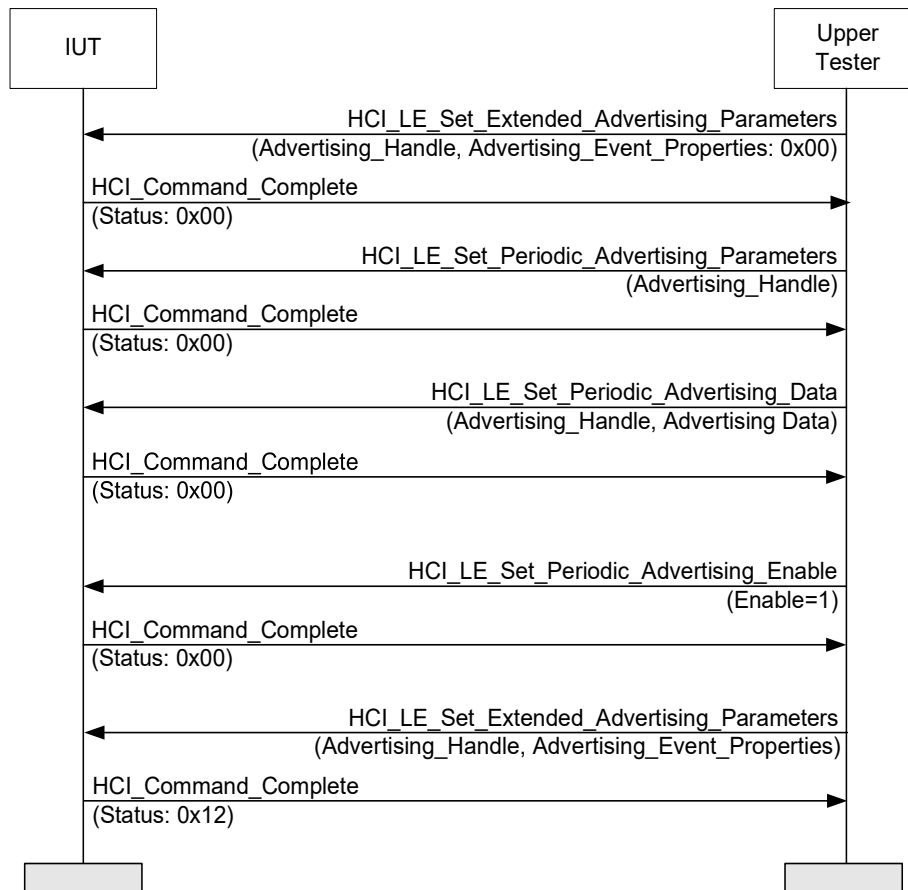


Figure 4.36: Reject Set Extended Advertising Parameters Command using a Periodic Advertising Set and Incompatible Advertising is Specified MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Advertising Handle set to a valid advertising set and Advertising_Event_Properties set to 0x00.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Advertising_Handle set equal to the Advertising_Handle in Step 1.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
5. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set equal to the Advertising_Handle in Step 1 and the specified Advertising Data.

6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
7. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable set to 1.
8. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
9. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command with the specified advertising set and type of advertising specified in [Table 4.16](#).
10. The IUT returns an HCI_Command_Complete event with the error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

The IUT rejects the advertising set for each advertising type specified in [Table 4.16](#), returning the error code Invalid HCI Command Parameters (0x12).

4.7.3 Reject Set Periodic Advertising Parameters Command when the Associated Handle Specifies Incompatible Advertising

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Periodic_Advertising_Parameters command when the associated handle specifies scannable, connectable, legacy, or anonymous advertising.

- Reference

[\[12\]](#) 7.8.61

- Initial Condition

- An advertising set exists and is no greater than 0x1F in length, if required by the advertising type specified in [Table 4.17](#).

- Test Case Configuration

Test Case	Specified Advertising Type	Advertising_Event_Properties
HCI/DDI/BI-26-C	Non-connectable non-scannable anonymous undirected	0b00100000
HCI/DDI/BI-27-C	Non-connectable non-scannable anonymous directed	0b00100100
HCI/DDI/BI-28-C	Legacy connectable and scannable undirected	0b00010011
HCI/DDI/BI-29-C	Legacy connectable directed (low duty cycle)	0b00010101
HCI/DDI/BI-30-C	Legacy connectable directed (high duty cycle)	0b00011101
HCI/DDI/BI-31-C	Legacy scannable undirected	0b00010010
HCI/DDI/BI-32-C	Legacy non-connectable and non-scannable, undirected	0b00010000
HCI/DDI/BI-33-C	Extended connectable undirected	0b00000001
HCI/DDI/BI-34-C	Extended connectable directed	0b00000101
HCI/DDI/BI-35-C	Extended scannable undirected	0b00000010
HCI/DDI/BI-36-C	Extended scannable directed	0b00000110

Table 4.17: Reject Set Periodic Advertising Parameters Command when the Associated Handle Specifies Incompatible Advertising test cases

- Test Procedure

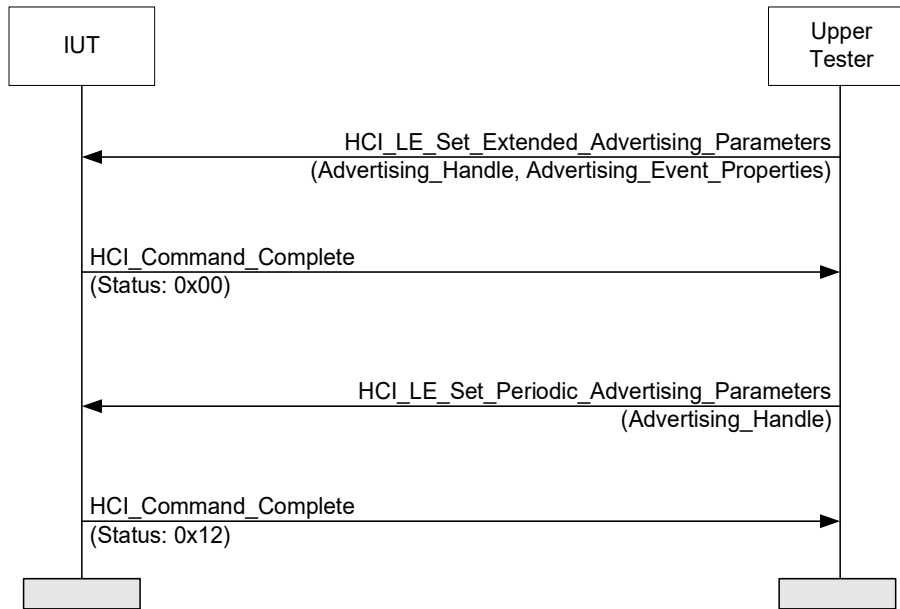


Figure 4.37: Reject Set Periodic Advertising Parameters Command when the Associated Handle Specifies Incompatible Advertising MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command with the specified advertising set (if required) and type of advertising specified in [Table 4.17](#).
2. The IUT returns a successful HCI_Command_Complete.
3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters to the IUT using the Advertising Handle used in Step 1.
4. The IUT returns an HCI_Command_Complete with error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

The IUT rejects the advertising set for each advertising type specified, returning the error code Invalid HCI Command Parameters (0x12).

4.7.4 Reject Set Periodic Advertising Enable Command when the Associated Handle Specifies Incompatible Advertising

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Set_Periodic_Advertising_Enable command when the associated handle specifies scannable, connectable, legacy, or anonymous advertising.

- Reference

[\[13\]](#) 7.8.63

- Initial Condition

- An advertising set exists and is no greater than 0x1F in length, if required by the advertising type specified in [Table 4.18](#).

- Test Case Configuration

Test Case	Specified Advertising Type	Advertising_Event_Properties
HCI/DDI/BI-37-C	Non-connectable non-scannable anonymous undirected	0b00100000
HCI/DDI/BI-38-C	Non-connectable non-scannable anonymous directed	0b00100100
HCI/DDI/BI-39-C	Legacy connectable and scannable undirected	0b00010011
HCI/DDI/BI-40-C	Legacy connectable directed (low duty cycle)	0b00010101
HCI/DDI/BI-41-C	Legacy connectable directed (high duty cycle)	0b00011101
HCI/DDI/BI-42-C	Legacy scannable undirected	0b00010010
HCI/DDI/BI-43-C	Legacy non-connectable and non-scannable, undirected	0b00010000
HCI/DDI/BI-44-C	Extended connectable undirected	0b00000001
HCI/DDI/BI-45-C	Extended connectable directed	0b00000101
HCI/DDI/BI-46-C	Extended scannable undirected	0b00000010
HCI/DDI/BI-47-C	Extended scannable directed	0b00000110

Table 4.18: Reject Set Periodic Advertising Enable Command when the Associated Handle Specifies Incompatible Advertising test cases

- Test Procedure

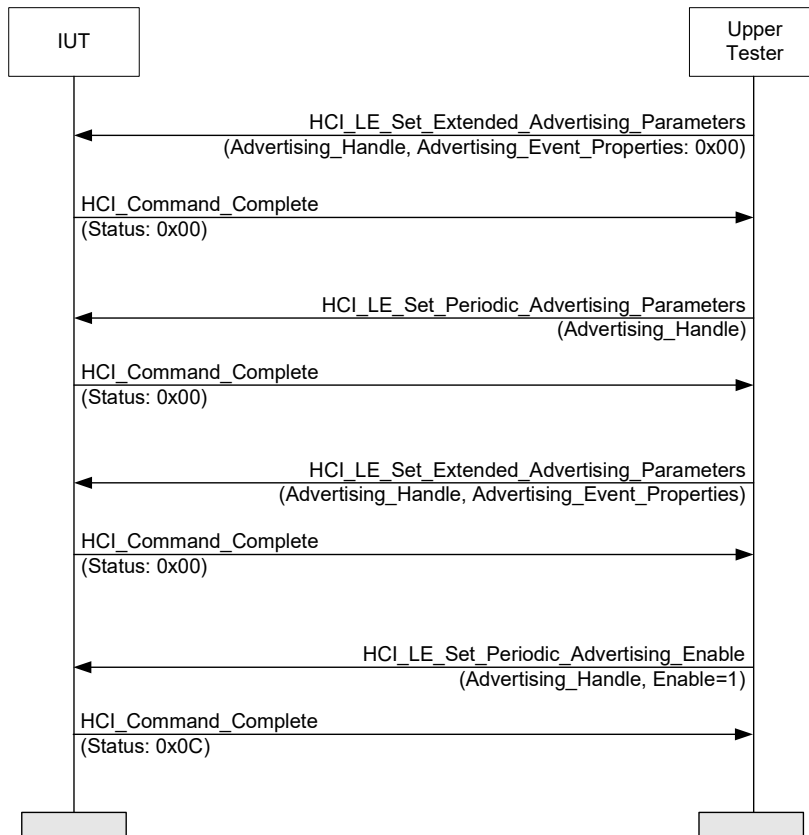


Figure 4.38: Reject Set Periodic Advertising Enable Command when the Associated Handle Specifies Incompatible Advertising MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Advertising Handle set to a valid advertising set and Advertising_Event_Properties set to 0x00.
2. The IUT returns a successful HCI_Command_Complete.
3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters to the IUT using the Advertising Handle used in Step 1.
4. The IUT returns an HCI_Command_Complete event with Status set to 0x00.
5. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command with the specified advertising set and type of advertising specified in [Table 4.18](#).
6. The IUT returns a successful HCI_Command_Complete.
7. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT using the Advertising Handle from Step 5 and Enable set to 1.
8. The IUT returns an HCI_Command_Complete event with Status set to Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

The IUT rejects the advertising set for each advertising type specified, returning the error code Command Disallowed (0x0C).

HCI/DDI/BI-48-C [LE Set Data Related Address Changes, Invalid Parameter]

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Set_Data_Related_Address_Changes command with an invalid Advertising_Handle parameter.

- Reference

[\[11\]](#) 7.8.122

- Initial Condition

- The IUT is not currently advertising.
- The Upper Tester has not sent Legacy Advertising commands to the IUT.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with a valid Advertising_Handle parameter and receives a successful HCI_Command_Complete event in return.
2. The Upper Tester sends an HCI_LE_Set_Data_Related_Address_Changes command to the IUT with an Advertising_Handle parameter that is not a valid advertising handle.
3. The IUT sends an HCI_Command_Complete event to the Upper Tester with error Unknown Advertising Identifier (0x42).

- Expected Outcome

Pass verdict

A Command_Complete event for the HCI_LE_Set_Data_Related_Address_Changes command is received by the Upper Tester with the Unknown Advertising Identifier (0x42) error code.

HCI/DDI/BV-06-C [Default Extended Scan Enable Command]

- Test Purpose

Verify that the IUT properly handles an HCI_LE_Set_Extended_Scan_Enable command when the IUT is not properly configured, and returns the expected error code or executes with the vendor-specific parameters.

- Reference

[9] 7.8.65

- Initial Condition

- The IUT is in standby.
- Extended scanning parameters set have not been configured on the IUT (HCI_LE_Set_Extended_Scan_Parameters was not previously executed).

- Test Procedure

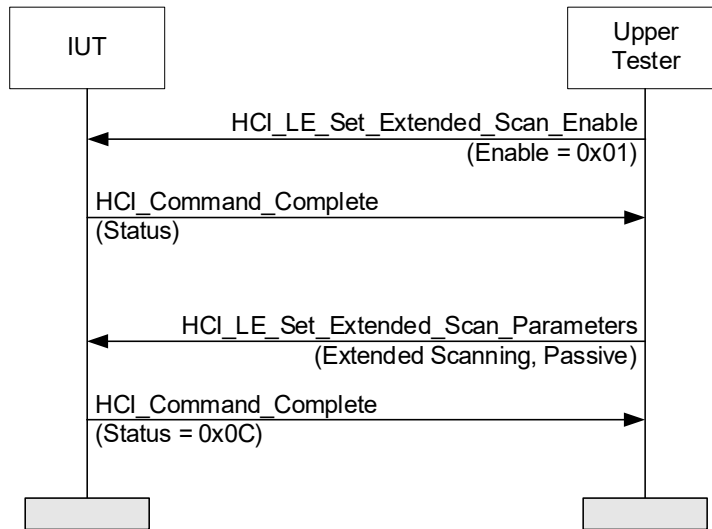


Figure 4.39: HCI/DDI/BV-06-C [Default Extended Scan Enable Command] MSC

1. The Upper Tester sends the HCI_LE_Set_Extended_Scan_Enable command with the Enable parameter set to 0x01 and with all other parameters set to valid values.
2. The IUT returns an HCI_Command_Complete event with the Status = 0x0C ("Command Disallowed"), stopping the test here; or with Status = 0x00 ("Success") and the IUT starts a scanning procedure.
3. If the return code in Step 2 is Status = 0x00 ("Success"), the Upper Tester sends an HCI_LE_Set_Extended_Scan_Parameters with a valid set of parameters (Scanning_PHYs set to a supported PHY, Scan_Type[0] set to 0x00 (Passive Scanning), Scan_Interval[0] set to 0x0010, Scan_Window[0] set to 0x0010, Own_Address_Type set to 0x00 (Public Device Address) and Scanning_Filter_Policy set to 0x00 (Accept All)).
4. The IUT sends to the Upper Tester an HCI_Command_Complete event with Status = 0x0C ("Command Disallowed").

- Expected Outcome

Pass verdict

In Step 2, the IUT generates an HCI_Command_Complete event either with Status = 0x0C ("Command Disallowed") or with Status = 0x00 ("Success").

If the status in Step 2 was Status = 0x00 ("Success"), then in Step 4 the IUT will generate an HCI_Command_Complete with Status = 0x0C ("Command Disallowed").

HCI/DDI/BV-07-C [Set Periodic Advertising Before Periodic Advertising Parameters Command]

- Test Purpose

Verify that the IUT correctly handles an HCI_LE_Set_Periodic_Advertising_Enable command sent before the HCI_LE_Set_Periodic_Advertising_Parameters command is sent.
- Reference

[13] 7.8.63
- Initial Condition
 - The IUT is in standby.
 - Extended advertising parameters have not been configured on the IUT for a particular advertising handle.
- Test Procedure

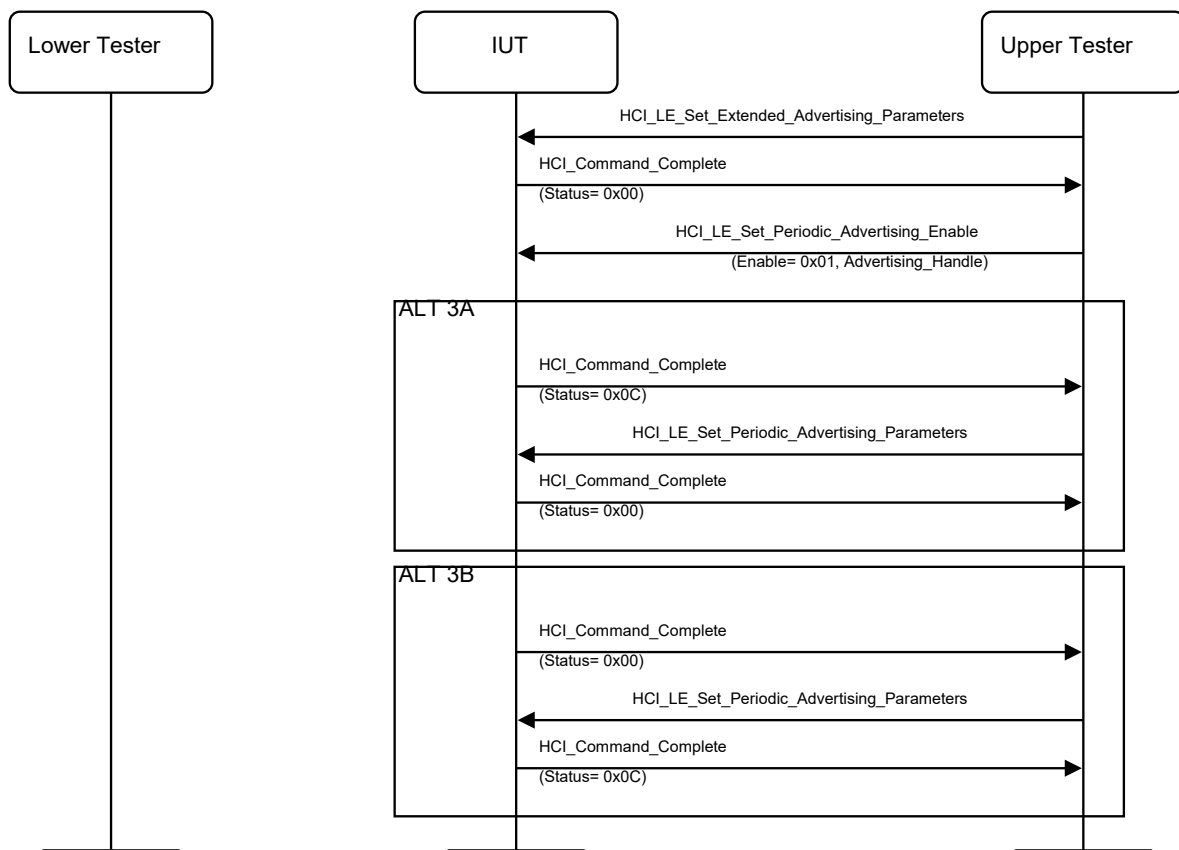


Figure 4.40: HCI/DDI/BV-07-C [Set Periodic Advertising Before Periodic Advertising Parameters Command] MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT and receives a successful HCI_Command_Complete event in return from the IUT.
2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable to the IUT with the Enable parameter set to 0x01 and the Advertising_Handle set to the existing Advertising_Handle.
3. Perform either alternative 3A or 3B depending on whether the IUT enabled advertising or not, which in turn depends on whether it supports vendor-specific advertising parameters:
 Alternative 3A (The IUT does not support vendor-specific advertising parameters):
 - 3A.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with the error code Command Disallowed (0x0C).
 - 3A.2 The IUT sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT.
 - 3A.3 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
 Alternative 3B (The IUT supports vendor-specific advertising parameters):
 - 3B.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with the Status set to 0x00.
 - 3B.2 The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT.
 - 3B.3 The IUT sends an HCI_Command_Complete event to the Upper Tester with the error code Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Step 3A.1, the IUT sends an HCI_Command_Complete event to the Upper Tester with the error code Command Disallowed (0x0C).

In Steps 3A.3 and 3B.1, the IUT sends an HCI_Command_Complete event to the Upper Tester with the Status set to 0x00.

In Step 3B.2, the IUT sends an HCI_Command_Complete event to the Upper Tester with the error code Command Disallowed (0x0C).

HCI/DDI/BI-49-C [Reject LE Periodic Advertising Create Sync Command With Disallowed Reporting Options, Periodic Advertising ADI not supported]

- Test Purpose

Verify that the IUT that doesn't support Periodic Advertising ADI properly rejects invalid reporting options in the HCI_LE_Periodic_Advertising_Create_Sync command and returns the expected error code.

- Reference

[13] 7.8.67

- Initial Condition

- The Lower Tester is advertising with extended advertising and periodic advertising.
- The IUT is scanning for extended advertising and has received the Advertising SID, Advertiser Address Type, and Advertiser Address.

- Test Procedure

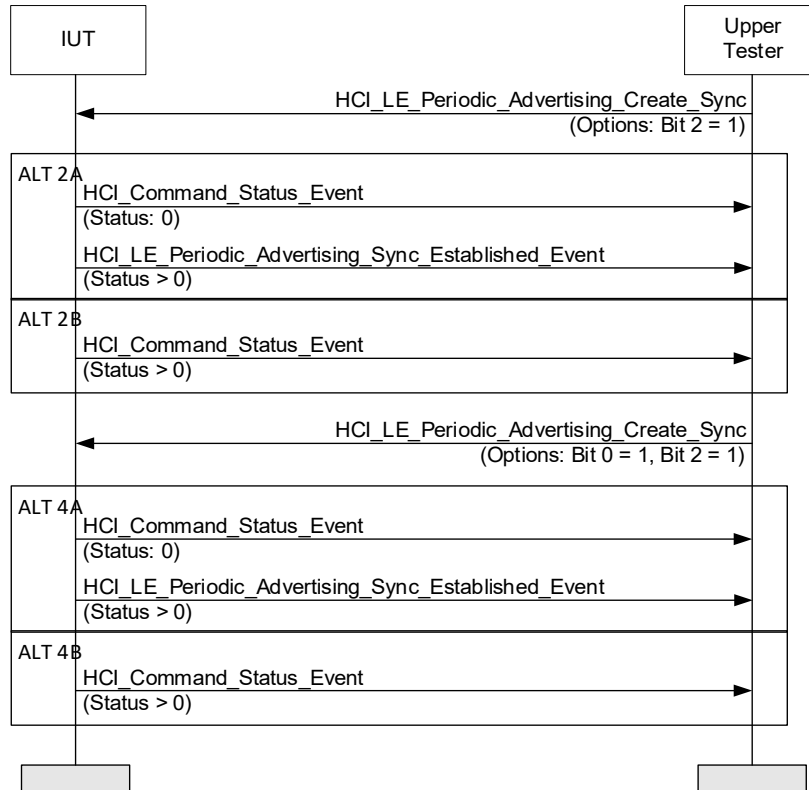


Figure 4.41: HCI/DDI/BI-49-C [Reject LE Periodic Advertising Create Sync Command With Disallowed Reporting Options, Periodic Advertising ADI not supported] MSC

- Test Procedure

- The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's periodic advertisements. Options is set to 0x04 (Don't Use List, Reporting Enabled, Duplicate Filtering Enabled).
- Perform either alternative 2A or 2B depending on the event returned.

Alternative 2A (The IUT returns a successful HCI_Command_Status event):

 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with Status set to a valid error code.

Alternative 2B (The IUT returns an HCI_Command_Status event with an error code):

 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.
- The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's periodic advertisements. Options is set to 0x05 (Use List, Reporting Enabled, Duplicate Filtering Enabled).
- Perform either alternative 4A or 4B depending on the event returned.

Alternative 4A (The IUT returns a successful HCI_Command_Status event):

 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with Status set to a valid error code.

Alternative 4B (The IUT returns an HCI_Command_Status event with an error code):

 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.

- Expected Outcome

Pass verdict

In Steps 2A.2 and 4A.2, the IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with Status set to a valid error code.

In Steps 2B.1 and 4B.1, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.

HCI/DDI/BV-08-C [LE Periodic Advertising Create Sync Command, Reporting Disabled]

- Test Purpose

Verify that the IUT that supports Periodic Advertising ADI properly handles disabling of periodic advertising reports.

- Reference

[13] 7.8.67

- Initial Condition

- The Lower Tester is advertising with extended advertising and periodic advertising.
- The IUT is scanning for extended advertising.

- Test Procedure

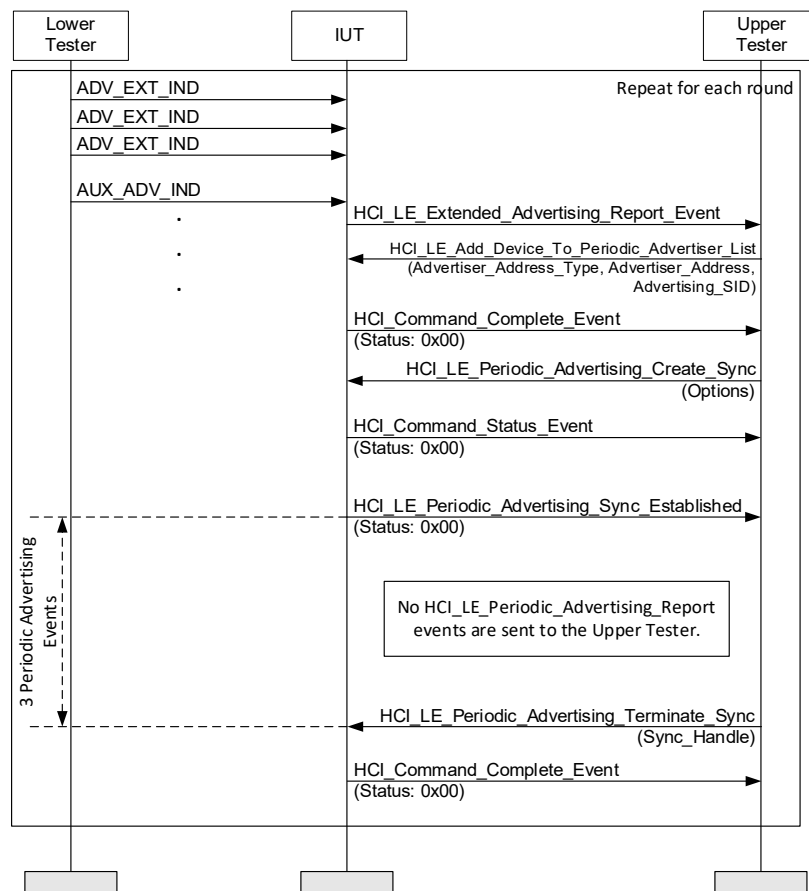


Figure 4.42: HCI/DDI/BV-08-C [LE Periodic Advertising Create Sync Command, Reporting Disabled] MSC

- Test Procedure
 1. The IUT receives an AUX_ADV_IND packet from the Lower Tester and sends an HCI_LE_Extended_Advertising_Report event to the Upper Tester with the Advertising_SID, Advertiser_Address_Type, and Advertiser_Address of the Lower Tester.
 2. If the Options Selected in [Table 4.19](#) includes 'Use List', the Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List with Advertiser_Address_Type, Advertiser_Address, and Advertising_SID set as received in Step 1 and receives a successful HCI_Command_Complete event in response.
 3. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's periodic advertisements. The Options field is set to the value in [Table 4.19](#) for the round, and a successful HCI_Command_Status event is sent in response.
 4. The IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with the Advertising_SID, Advertiser_Address_Type, and Advertiser_Address set to the values in Step 3 and with a valid Sync_Handle.
 5. The IUT does not send any HCI_LE_Periodic_Advertising_Report events to the Upper Tester for 3 advertising intervals.
 6. Immediately after 3 periodic advertising events, the Upper Tester sends an HCI_LE_Periodic_Advertising_Terminate_Sync command to the IUT with Sync_Handle set to the value received in Step 4 and receives a successful HCI_Command_Complete event in response.
 7. If the Options Selected in [Table 4.19](#) includes 'Use List', the Upper Tester sends an HCI_LE_Clear_Periodic_Advertiser_List and receives a successful HCI_Command_Complete event in response.
 8. Repeat Steps 1–7 for each round.

Round	Options Field Value	Options Selected
1	0x02 (Bit 1)	Don't Use List, Reporting Disabled, Duplicate Filtering Disabled
2	0x03 (Bits 0, 1)	Use List, Reporting Disabled, Duplicate Filtering Disabled
3	0x06 (Bits 1, 2)	Don't Use List, Reporting Disabled, Duplicate Filtering Enabled
4	0x07 (Bits 0, 1, 2)	Use List, Reporting Disabled, Duplicate Filtering Enabled

Table 4.19: HCI/DDI/BV-08-C [LE Periodic Advertising Create Sync Command, Reporting Disabled], option field value

- Expected Outcome

Pass verdict

In Step 5, the IUT does not send HCI_LE_Periodic_Advertising_Report events to the Upper Tester for 3 advertising intervals.

HCI/DDI/BV-09-C [LE Periodic Advertising Enable Command, Disable Periodic Advertising, Periodic Advertising ADI Supported]

- Test Purpose

Verify that the IUT that supports Periodic Advertising ADI properly handles disabling Periodic Advertising.

- Reference

[\[13\]](#) 7.8.63

- Initial Condition
 - Extended advertising parameters and periodic advertising parameters have been configured on the IUT for a particular advertising handle.
- Test Procedure

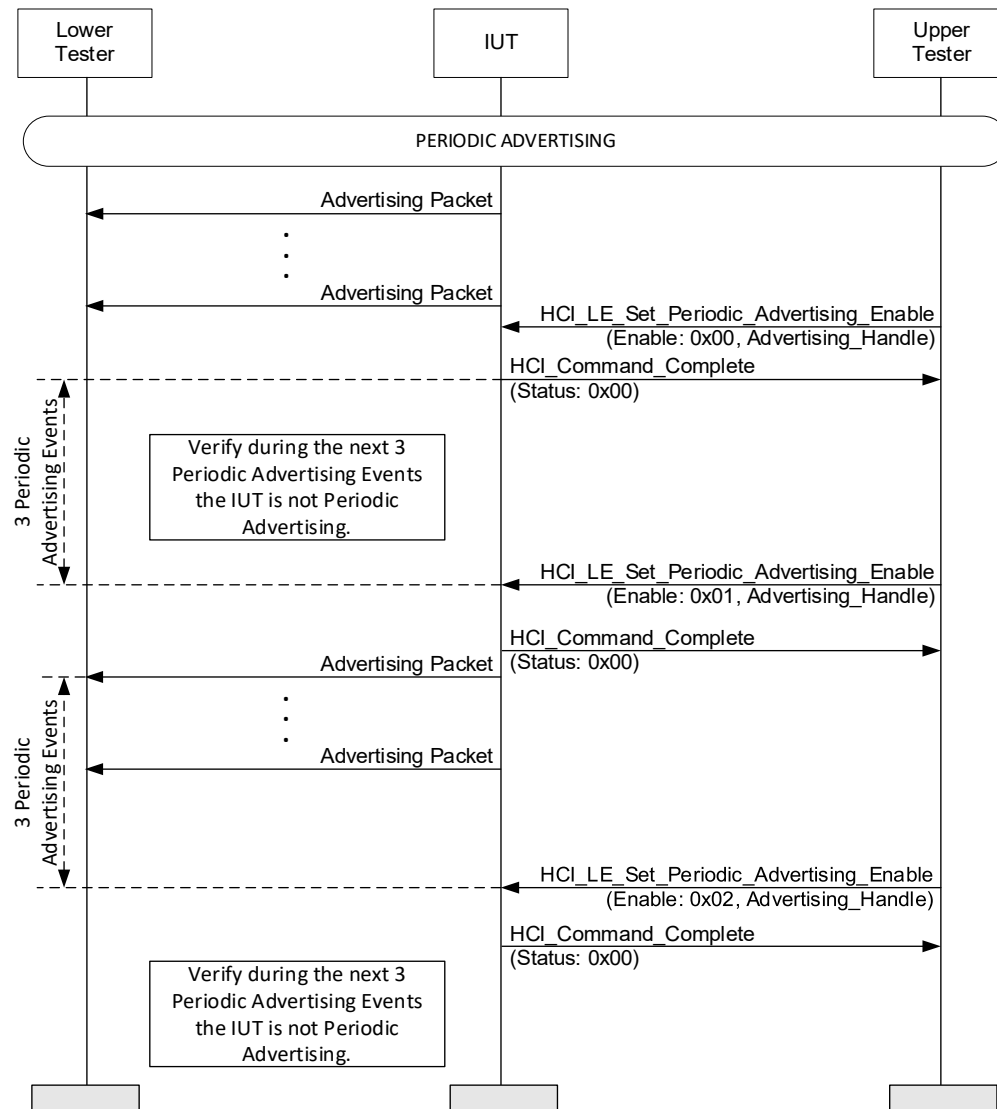


Figure 4.43: HCI/DDI/BV-09-C [LE Periodic Advertising Enable Command, Disable Periodic Advertising, Periodic Advertising ADI Supported] MSC

- The IUT has started periodic advertising for a particular advertising handle.
- The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Advertising_Handle set to the current advertising handle and Enable set to 0x00 and receives a successful HCI_Command_Complete event in response.
- The Lower Tester verifies that no periodic advertisements are sent from the IUT for the next three periodic advertising events.
- Immediately after 3 periodic advertising events, to restart periodic advertising, the Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Advertising_Handle set to the advertising handle in Step 2 and Enable set to 0x01 and receives a successful HCI_Command_Complete event in response.

5. After three periodic advertising events, the Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Advertising_Handle set to the advertising handle in Step 4 and Enable set to 0x02 and receives a successful HCI_Command_Complete event in response.
6. The Lower Tester verifies that no periodic advertisements are sent from the IUT for the next three periodic advertising events.

- Expected Outcome

Pass verdict

In Step 3, the Lower Tester does not receive any periodic advertisements from the IUT.

In Step 6, the Lower Tester does not receive any periodic advertisements from the IUT.

4.7.5 Reject Set Periodic Advertising Parameters Command when Advertising Data Too Long

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Set_Periodic_Advertising_Parameters command when existing periodic advertising data is greater than the controller can transmit within the periodic advertising interval.

- Reference

[12] 7.8.61

- Initial Condition

- State: The IUT is in Standby.
- TSPX_per_adv_interval_min is the minimum Periodic Advertising interval that is supported, as defined in the IXT.

- Test Case Configuration

Test Case	Primary_Advertising_PHY	Operation
HCI/DDI/BI-50-C [LE Set Periodic Advertising Parameters, Reject, Data Too Long, LE 1M PHY]	LE 1M PHY	0x00
HCI/DDI/BI-51-C [LE Set Periodic Advertising Parameters, Reject, Data Too Long, LE Coded PHY]	LE Coded PHY	0x02

Table 4.20: Reject Set Periodic Advertising Parameters Command when Advertising Data Too Long test cases

- Test Procedure

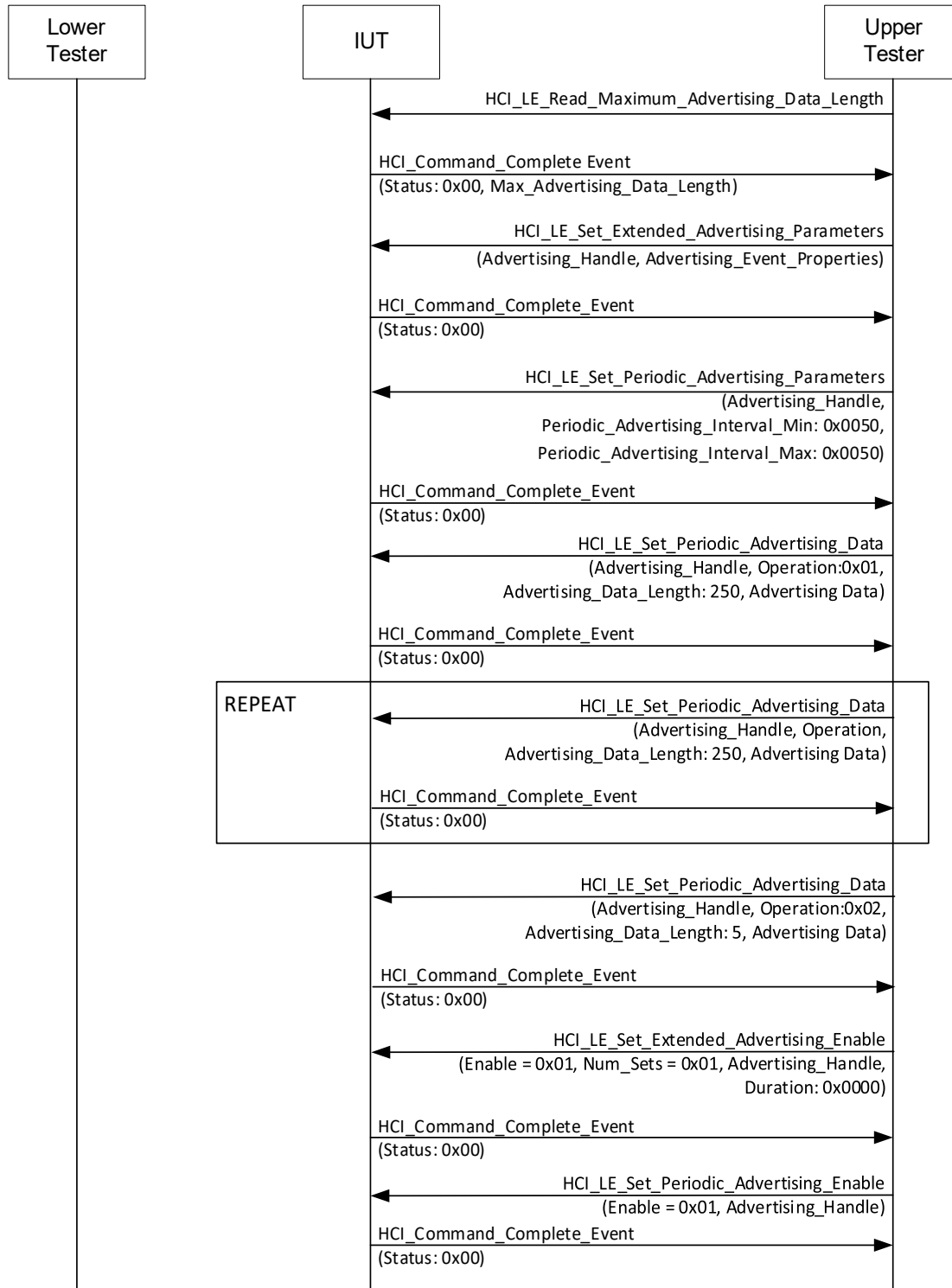


Figure 4.44: Reject Set Periodic Advertising Parameters Command when Advertising Data Too Long MSC – Page 1 of 2

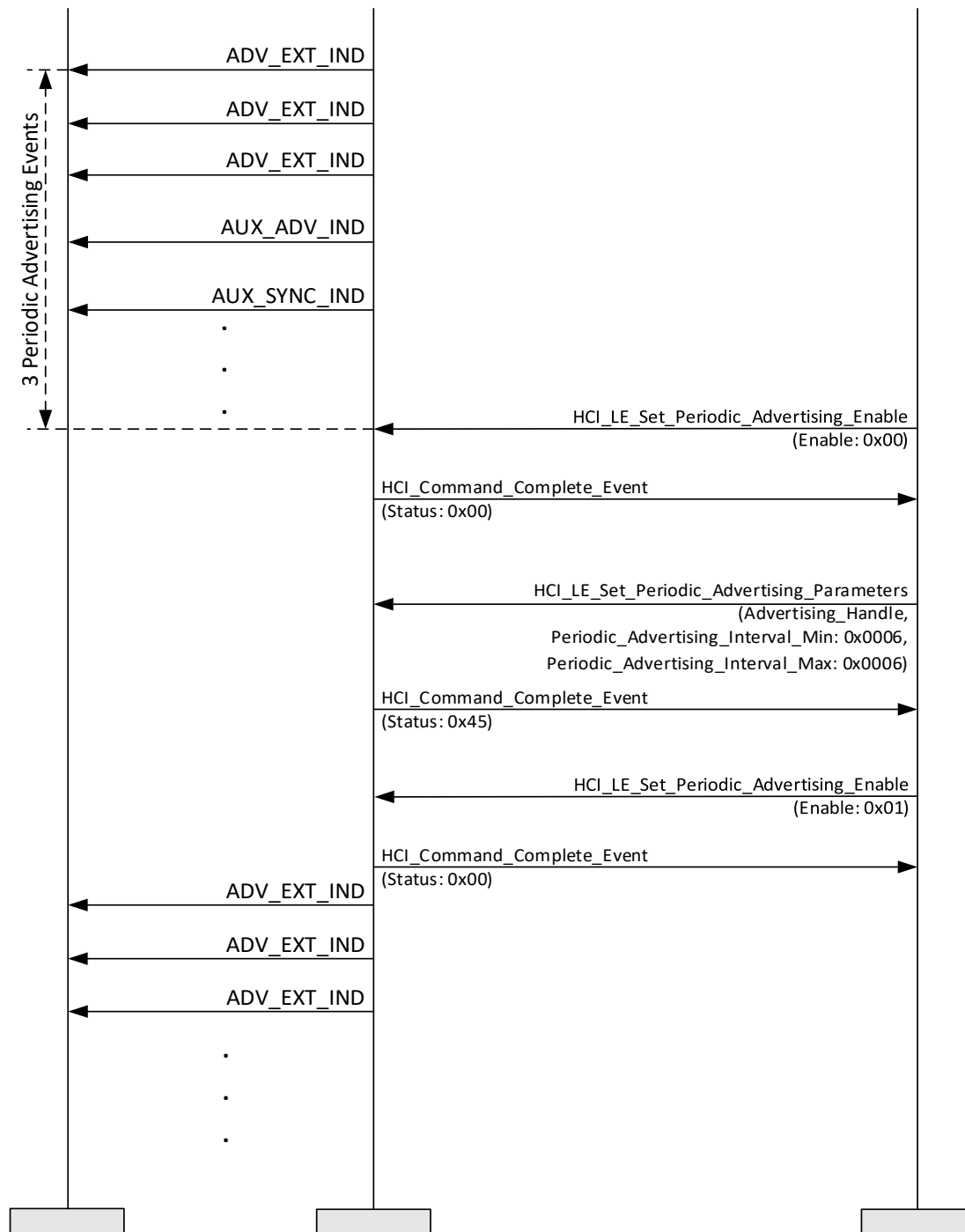


Figure 4.45: Reject Set Periodic Advertising Parameters Command when Advertising Data Too Long MSC – Page 2 of 2

1. The Upper Tester sends an HCI_LE_Read_Maximum_Advertising_Data_Length command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Max_Advertising_Data_Length set to the IUT's maximum length of advertising data permitted.
3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with valid values and receives a successful HCI_Command_Complete event.

4. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Advertising_Handle set to the value from Step 3, Periodic_Advertising_Interval_Min set to 0x0050 (100 ms), and Periodic_Advertising_Interval_Max set to 0x0050 (100 ms), and it receives a successful HCI_Command_Complete event.
5. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Advertising_Data_Length set to 250 with Advertising_Data set to 250 random octets from 1 to 254 as the payload. The Operation parameter is set to 0x01. The Upper Tester receives a successful HCI_Command_Complete event in response.
6. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Advertising_Data_Length set to 250, Advertising_Data set to 250 random octets from 1 to 254 as the payload, and Operation set as specified in [Table 4.20](#), and it receives a successful HCI_Command_Complete event in response.
7. If LE 1M PHY is used, repeat Step 6 one time. If LE Coded PHY is used, go to Step 9.
8. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Operation set to 0x02, and Advertising_Data_Length set to 5 and Advertising_Data set to 5 random octets from 1 to 254 as the payload, and it receives a successful HCI_Command_Complete event in response.
9. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Enable command to the IUT with Enable set to 0x01, Num_Sets set to 0x01, Advertising_Handle set to the value in Step 3, and Duration set to 0x0000, and it receives a successful HCI_Command_Complete event in response.
10. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable set to 0x01, and it receives a successful HCI_Command_Complete event in response.
11. Immediately after 3 advertising events, the Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable set to 0x00, and it receives a successful HCI_Command_Complete event in response.
12. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Advertising_Handle set to the value from Step 3, Periodic_Advertising_Interval_Min set to 0x0006 (7.5 ms), and Periodic_Advertising_Interval_Max set to 0x0006 (7.5 ms).
13. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).
14. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable set to 0x01, and it receives a successful HCI_Command_Complete event in response.
15. The IUT begins sending periodic advertisements.

- Expected Outcome

Pass verdict

In Step 14, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).

In Step 15, the IUT begins sending periodic advertisements.

Inconclusive verdict

The Max_Advertising_Data_Length of the IUT is less than 755 octets when the LE 1M PHY is used.

The Max_Advertising_Data_Length of the IUT is less than 500 octets when the LE Coded PHY is used.

TSPX_per_adv_interval_min of the IUT is greater than 0x0006 (7.5 ms).

HCI/DDI/BI-52-C [Reject Set Periodic Advertising Data Command when Advertising Data Too Long]

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Set_Periodic_Advertising_Data command when provided periodic advertising data is greater than the controller can transmit within the periodic advertising interval.

- Reference

[\[12\]](#) 7.8.62

- Initial Condition

- State: The IUT is in Standby.

- Test Procedure

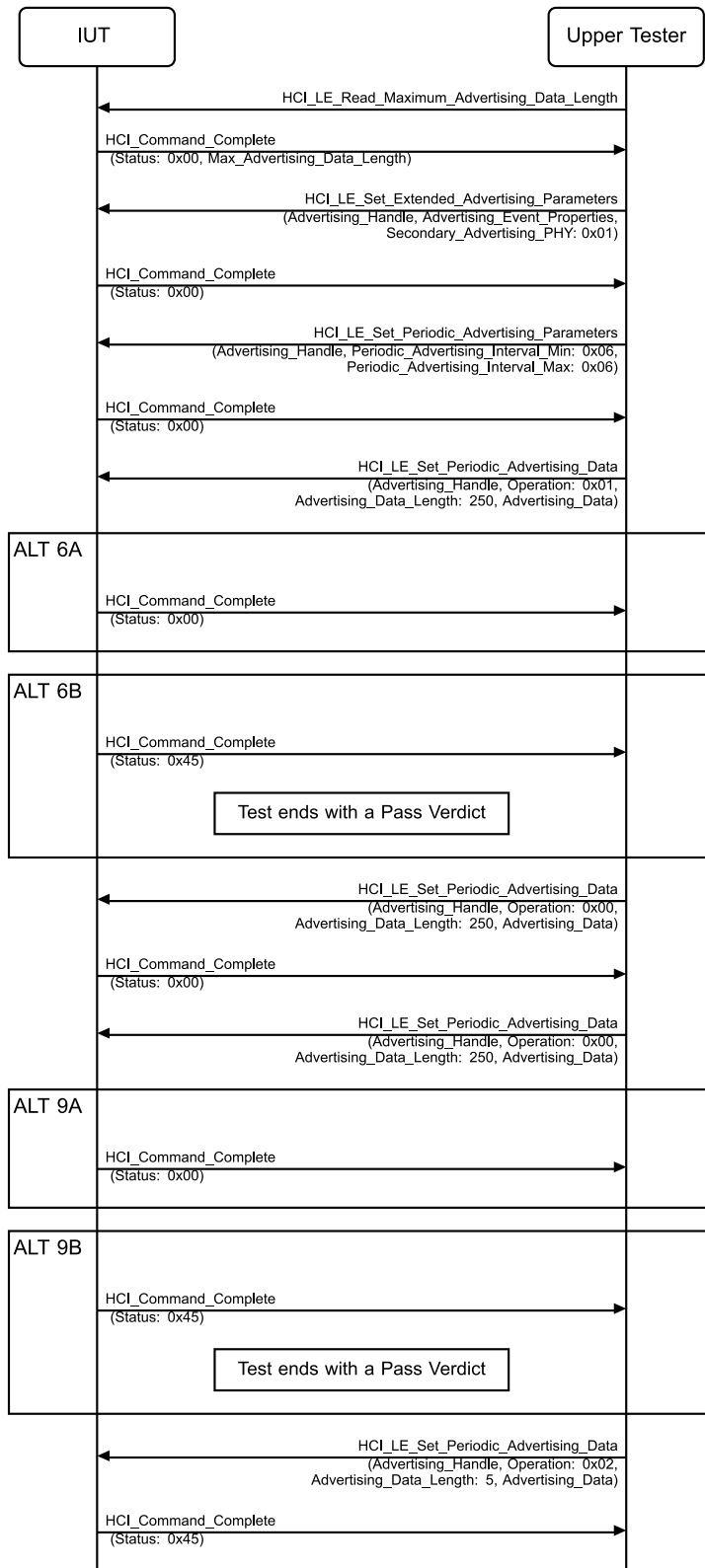


Figure 4.46: HCI/DDI/BI-52-C [Reject Set Periodic Advertising Data Command when Advertising Data Too Long] MSC

1. The Upper Tester sends an HCI_LE_Read_Maximum_Advertising_Data_Length command to the IUT.
 2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Max_Advertising_Data_Length set to the IUT's maximum length of advertising data permitted.
 3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Secondary_Advertising_PHY set to 0x01 (LE 1M PHY) and valid values, and it receives a successful HCI_Command_Complete event.
 4. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Advertising_Handle set to the value from Step 3, Periodic_Advertising_Interval_Min set to 0x0006 (7.5 ms), and Periodic_Advertising_Interval_Max set to 0x0006 (7.5 ms), and it receives a successful HCI_Command_Complete event.
 5. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Operation set to 0x01, and Advertising_Data_Length set to 250 and Advertising_Data set to 250 random octets from 1 to 254 as the payload.
 6. Perform alternative 6A or 6B depending on the received HCI_Command_Complete event.
Alternative 6A (The IUT sends a successful HCI_Command_Complete event to the Upper Tester):
6A.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
Alternative 6B (The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x45):
6B.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).
6B.2 The test ends with a Pass Verdict.
 7. Perform Steps 8 and 9 twice.
 8. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Operation set to 0x00, and Advertising_Data_Length set to 250 and Advertising_Data set to 250 random octets from 1 to 254 as the payload.
 9. Perform alternative 9A or 9B depending on the received HCI_Command_Complete event.
Alternative 9A (The IUT sends a successful HCI_Command_Complete event to the Upper Tester):
9A.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
Alternative 9B (The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x45):
9B.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).
9B.2 The test ends with a Pass verdict.
 10. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 3, Operation set to 0x02, Advertising_Data_Length set to 5, and Advertising_Data set to 5 random octets from 1 to 254 as the payload.
 11. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).
- Expected Outcome
Pass verdict
In Step 6B.1, 9B.1, or 11, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).

Inconclusive verdict

The Max_Advertising_Data_Length of the IUT is less than 755 octets.

The Periodic_Advertising_Interval_Min of the IUT is greater than 0x0006 (7.5 ms).

4.7.6 Reject LE Set Periodic Advertising Enable Command, Legacy Packet

- Test Purpose

Verify that the IUT properly rejects enabling periodic advertising when the advertising set identifies scannable, connectable, legacy, or anonymous advertising.

- Reference

[12] 7.8.63

- Initial Condition

- The IUT is in standby.

- Test Case Configuration

Test Case	Specified Advertising Type	Advertising_Event_Properties
HCI/DDI/BI-53-C	Non-connectable non-scannable anonymous undirected	0b00100000
HCI/DDI/BI-54-C	Non-connectable non-scannable anonymous directed	0b00100100
HCI/DDI/BI-55-C	Legacy connectable and scannable undirected	0b00010011
HCI/DDI/BI-56-C	Legacy scannable undirected	0b00010010
HCI/DDI/BI-57-C	Legacy non-connectable and non-scannable, undirected	0b00010000
HCI/DDI/BI-58-C	Extended connectable undirected	0b00000001
HCI/DDI/BI-59-C	Extended connectable directed	0b00000101
HCI/DDI/BI-60-C	Extended scannable undirected	0b00000010
HCI/DDI/BI-61-C	Extended scannable directed	0b00000110

Table 4.21: Reject LE Periodic Advertising Enable Command, Legacy Packet test cases

- Test Procedure

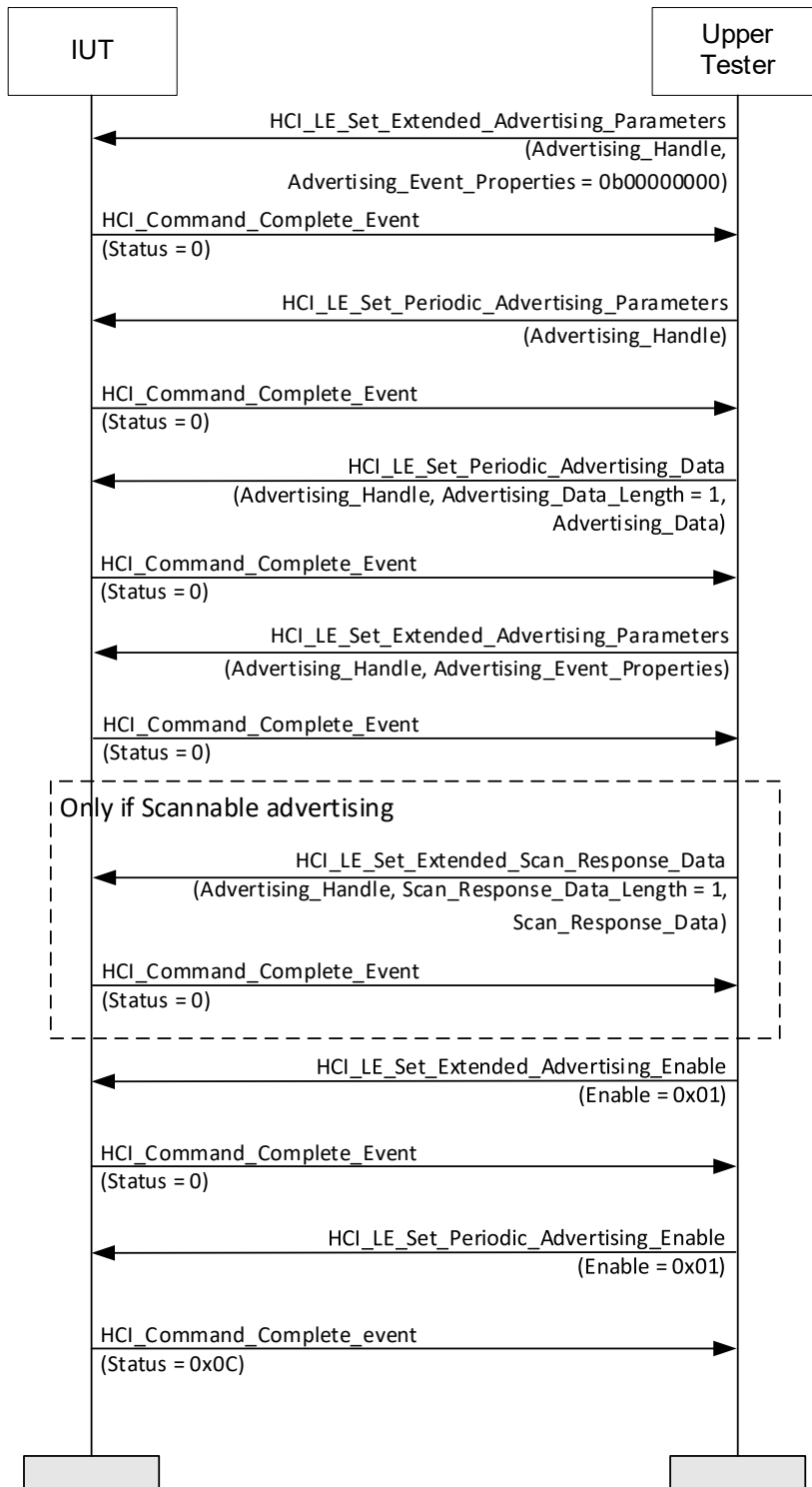


Figure 4.47: Reject LE Periodic Advertising Enable Command, Legacy Packet MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with a valid Advertising_Handle and with Advertising_Event_Properties set to extended non-scannable non-connectable (0b00000000) and receives a successful HCI_Command_Complete event in return.
 2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with the Advertising_Handle set to the value from Step 1 and receives a successful HCI_Command_Complete event in return.
 3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the value from Step 1, Advertising_Data_Length set to 1, Advertising_Data set to one random octet, and receives a successful HCI_Command_Complete event in return from the IUT.
 4. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Advertising_Handle set to the value from Step 1 and Advertising_Event_Properties set to the value in [Table 4.21](#), and receives a successful HCI_Command_Complete event in return.
 5. If the scannable advertising property bit (bit 1) is not set, skip to Step 6. Otherwise, the Upper Tester sends an HCI_LE_Set_Extended_Scan_Response_Data command to the IUT with Advertising_Handle set to the value from Step 1, Scan_Response_Data_Length set to 1, and Scan_Response_Data set to one random octet, and receives a successful HCI_Command_Complete event in return.
 6. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Enable command to the IUT with Enable set to 0x01, and receives a successful HCI_Command_Complete event in return.
 7. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable set to 0x01.
 8. The IUT sends an HCI_Command_Complete event with Status set to Command Disallowed (0x0C).
- Expected Outcome

Pass verdict

In Step 8, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

HCI/DDI/BI-62-C [Reject Set Extended Advertising Parameters Command, Packet Too Long, LE Coded]

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Set_Extended_Advertising_Parameters command when extended advertising data is greater than the controller can transmit within the advertising interval using the LE Coded PHY.
- Reference

[\[12\]](#) 7.8.53, 7.8.54
- Initial Condition
 - State: The IUT is in Standby.

- Test Procedure

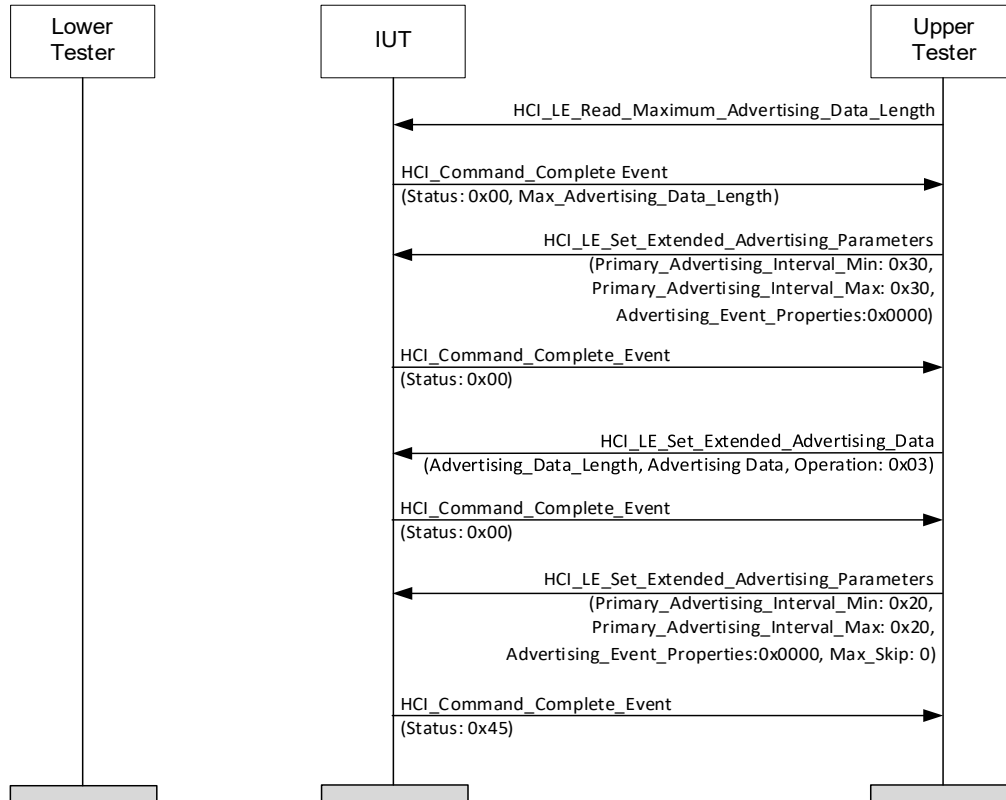


Figure 4.48: HCI/DDI/BI-62-C [Reject Set Extended Advertising Parameters Command, Packet Too Long, LE Coded] MSC

1. The Upper Tester sends an HCI_LE_Read_Maximum_Advertising_Data_Length command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Max_Advertising_Data_Length set to the IUT's maximum length of advertising data permitted.
3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Primary_Advertising_Interval_Min and Primary_Advertising_Interval_Max set to 30 ms (0x30), Advertising_Event_Properties set to non-connectable, non-scannable (0x0000), Primary and Secondary Phys set to LE Coded, and receives a successful HCI_Command_Complete event in return.
4. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Data command to the IUT setting the advertising data to 251 octets using random octets from 1 to 255 as the payload. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
5. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Primary_Advertising_Interval_Min and Primary_Advertising_Interval_Max set to 20 ms (0x20), Advertising_Event_Properties set to non-connectable, non-scannable (0x0000), and Max_Skip set to 0.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Packet Too Long (0x45).

- Expected Outcome

Pass verdict

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with the Packet Too Long (0x45) error code.

Inconclusive verdict

The Max_Advertising_Data_Length received in Step 2 is less than 251 octets.

4.7.7 Reject Set Extended Advertising Data Commands, Data Too Long

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Set_Extended_Advertising_Data and HCI_LE_Set_Extended_Scan_Response_Data commands when extended advertising data is greater than the controller can store.

- Reference

[12] 7.8.54, 7.8.55

- Initial Condition

- State: The IUT is in Standby.

- Test Case Configuration

Test Case	Primary Advertising PHY	Advertising_Event_Properties (Step 3)	HCI Command (Step 4)
HCI/DDI/BI-63-C [Reject Set Extended Advertising Data Command, Data Too Long, LE 1M PHY]	LE 1M PHY	0x0000	HCI_LE_Set_Extended_Advertising_Data
HCI/DDI/BI-64-C [Reject Set Extended Advertising Data Command, Data Too Long, LE Coded PHY]	LE Coded PHY	0x0000	HCI_LE_Set_Extended_Advertising_Data
HCI/DDI/BI-65-C [Reject Set Extended Scan Response Data Command, Data Too Long, LE 1M PHY]	LE 1M PHY	0x0002	HCI_LE_Set_Extended_Scan_Response_Data
HCI/DDI/BI-66-C [Reject Set Extended Scan Response Data Command, Data Too Long, LE Coded PHY]	LE Coded PHY	0x0002	HCI_LE_Set_Extended_Scan_Response_Data

Table 4.22: Reject Set Extended Advertising Data Commands, Data Too Long test cases

- Test Procedure

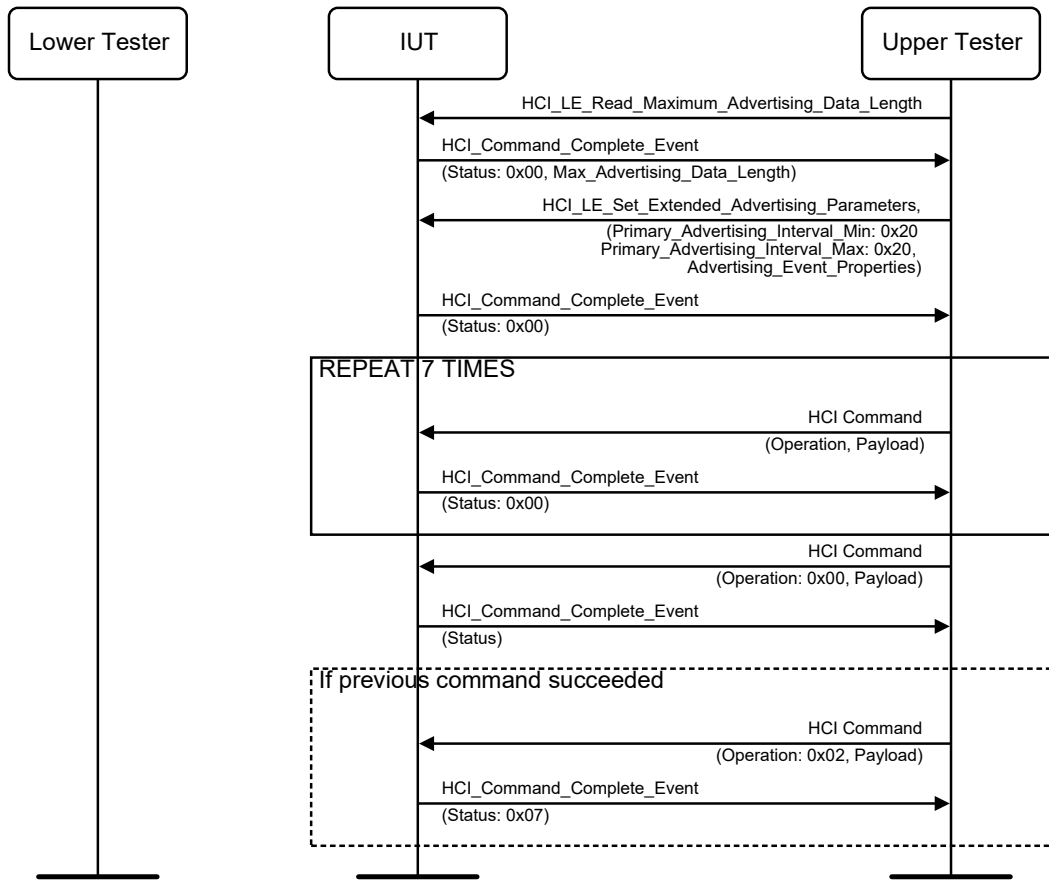


Figure 4.49: Reject Set Periodic Advertising Data Command when Advertising Data Too Long MSC

1. The Upper Tester sends an HCI_LE_Read_Maximum_Advertising_Data_Length command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Max_Advertising_Data_Length set to the IUT's maximum length of advertising data permitted.
3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Primary_Advertising_Interval_Min and Primary_Advertising_Interval_Max set to 200 ms (0x140) and Advertising_Event_Properties set to the value specified in [Table 4.22](#) and receives a successful HCI_Command_Complete event in return.
4. Perform Steps 5 and 6 a total of 7 times. The total amount of data sent in the 7 commands equals Max_Advertising_Data_Length – 1 octets.
5. The Upper Tester sends the HCI Command specified in the HCI Command column in [Table 4.22](#), using random octets as the payload. The first instance of this step sets Operation to 0x01 (first fragment), and the other instances set Operation to 0x00 (incomplete data).
6. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
7. The Upper Tester sends the HCI Command specified in the HCI Command column in [Table 4.22](#), using 2 random octets as the payload and Operation set to 0x00 (incomplete data).
8. The IUT sends an HCI_Command_Complete event to the Upper Tester.
9. If the Status is Memory Capacity Exceeded (0x07), the test ends with a Pass verdict. Otherwise, if the Status is not Success (0x00), the test ends with a Fail verdict.

10. The Upper Tester sends the HCI Command specified in the HCI Command column in [Table 4.22](#), using 1 random octet as the payload and Operation set to 0x02 (last fragment).
11. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Memory Capacity Exceeded (0x07).

- Expected Outcome

Pass verdict

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

In either Step 9 or Step 11, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Memory Capacity Exceeded (0x07).

Fail verdict

The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to any value except Success (0x00) or Memory Capacity Exceeded (0x07).

HCI/DDI/BI-68-C [Reject LE Set Extended Scan Parameters with Invalid Scan_Filter_Policy Parameters]

- Test Purpose

Verify that the IUT rejects the LE Set Extended Scan Parameters command when the controller does not support the Decision-based Advertising feature.

- Reference

[\[18\]](#) 7.8.64

- Initial Condition

- The IUT is not currently scanning.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Extended_Scan_Parameters command to the IUT with Scan_Filter_Policy having bits 2 and 3 set to a value other than 0b00.
2. The IUT sends an HCI_Command_Complete event with a non-zero Status. If the Status is not set to Unsupported Feature or Parameter Value (0x11), then issue a warning.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with a non-zero Status.

HCI/DDI/BI-69-C [LE Set Extended Advertising Parameters, Invalid Decision Parameters]

- Test Purpose

Verify that the IUT handles the Upper Tester sending invalid parameters for the LE Set Extended Advertising Parameters command using the Decision PDU bits.

- Reference

[\[18\]](#) 7.8.53

- Initial Condition
 - The IUT is not currently scanning.
- Test Procedure
 1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Primary_Advertising_PHY set to LE 1M and a valid Advertising_Event_Parameters field with bits 2 and 7 set to 1 and bits 8 and 9 set to 0.
 2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.
 3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Primary_Advertising_PHY set to LE 1M and a valid Advertising_Event_Parameters field with bits 7 and 9 set to 0 and bit 8 set to 1.
 4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.
 5. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Primary_Advertising_PHY set to LE 1M and a valid Advertising_Event_Parameters field with bits 7 and 8 set to 0 and bit 9 set to 1.
 6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.

Pass verdict

In Steps 2, 4, and 6, the IUT returns an 0x12 error to the Upper Tester.

4.7.8 Reject Set Periodic Advertising Data Command, Not Configured for Periodic Advertising

- Test Purpose

Verify that the IUT properly rejects the start of a Periodic Advertising command when an HCI_LE_Set_Periodic_Advertising_Parameters command has not been executed.
- Reference

[12] 7.8.62
- Initial Condition
 - Advertising data exists and is no greater than 0x1F in length.
- Test Case Configuration

Test Case	HCI Command
HCI/DDI/BI-70-C	HCI_LE_Set_Periodic_Advertising_Data
HCI/DDI/BI-71-C	HCI_LE_Set_Periodic_Advertising_Subevent_Data

Table 4.23: Reject Set Periodic Advertising Data Command, Not Configured for Periodic Advertising test cases

- Test Procedure

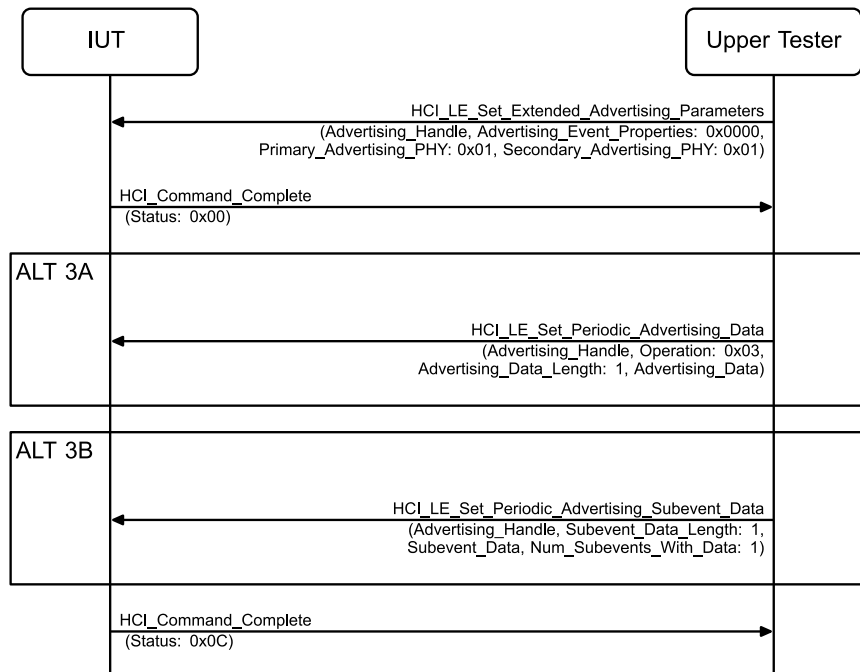


Figure 4.50: Reject Set Periodic Advertising Data Command, Not Configured For Periodic Advertising MSC

- The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command with an Advertising_Handle, Advertising_Event_Properties set to 0x0000, Primary_Advertising_PHY set to 0x01 (LE 1M), and Secondary_Advertising_PHY set to 0x01 (LE 1M).
- The IUT sends a successful HCI_Command_Complete to the Upper Tester.
- Perform either alternative 3A or 3B depending on the HCI Command.

Alternative 3A (HCI_LE_Set_Periodic_Advertising_Data command):

- 3A.1 The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT using the Advertising_Handle used in Step 1, Operation set to 0x03, Advertising_Data_Length set to 0x01, and Advertising_Data set to a random octet.

Alternative 3B (HCI_LE_Set_Periodic_Advertising_Subevent_Data command):

- 3B.1 The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT using the Advertising_Handle used in Step 1, Subevent_Data_Length set to 0x01, Subevent_Data set to a random octet, and Num_Subevents_With_Data set to 1.

- The IUT returns an HCI_Command_Complete with error code Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

The IUT rejects the periodic advertising data, returning the error code Command Disallowed (0x0C).

HCI/DDI/BI-72-C [Reject LE Periodic Advertising Subevent Data Command, Advertising Duration Too Long]

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Periodic_Advertising_Subevent_Data_Request command when the Advertising Duration is longer than the Periodic Advertising Response Slot Delay.

- Reference

[12] 7.8.125

- Initial Condition

- State: The IUT is in Standby.

- Test Procedure

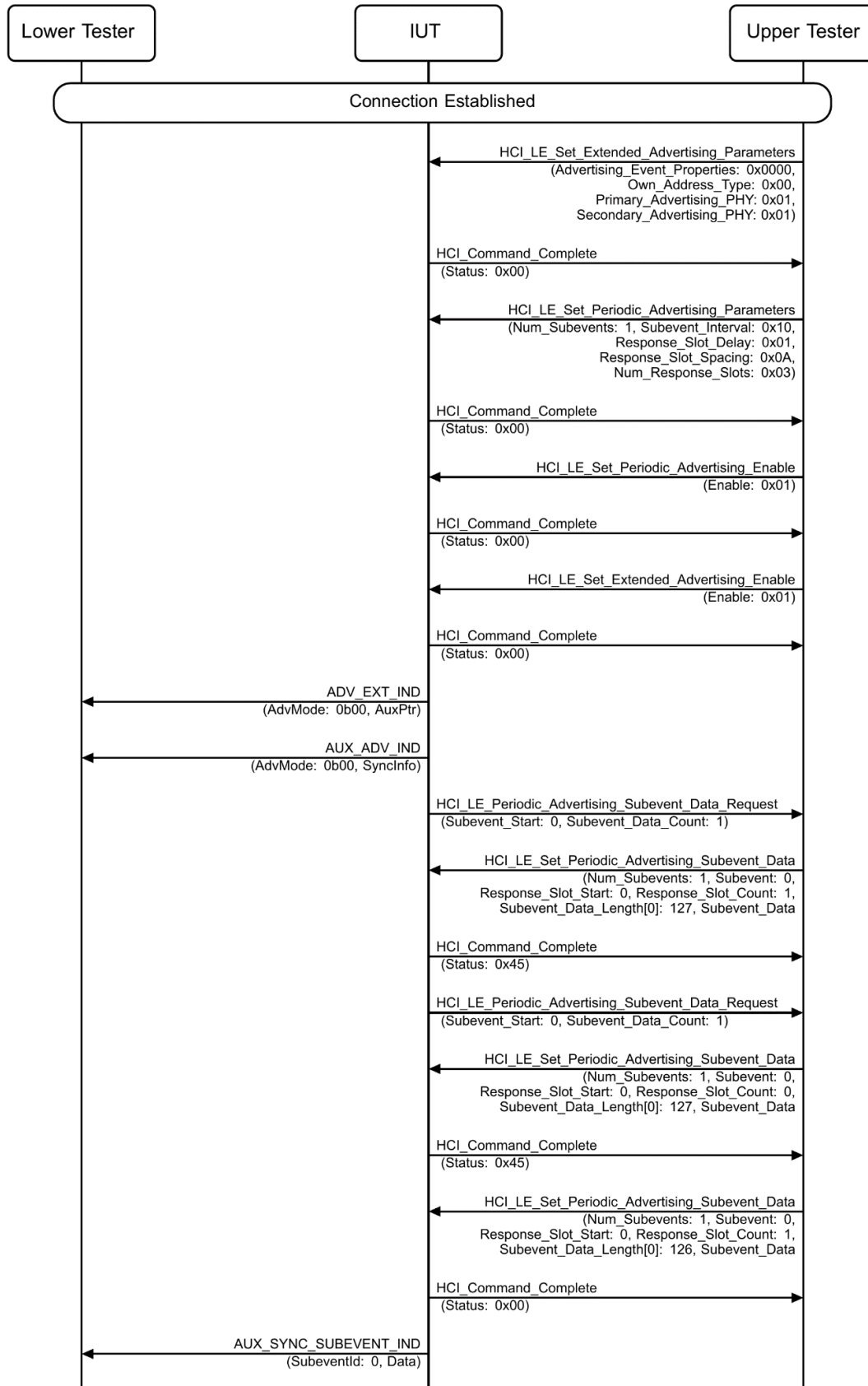


Figure 4.51: Reject LE Periodic Advertising Subevent Data Command, Advertising Duration Too Long MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT using a randomly supported advertising channel and a selected advertising interval between the minimum and maximum advertising intervals supported and receives an HCI_Command_Complete event in response. The Advertising_Event_Properties parameter is set to 0x0000. The Own_Address_Type is set to 0x00 (Public Device Address). Both Primary_Advertising_PHY and Secondary_Advertising_PHY are set to 0x01 (LE 1M).
2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters [v2] command to the IUT with Num_Subevents set to 1, Subevent_Interval set to 0x10 (20 ms), Response_Slot_Delay set to 0x01 (1.25 ms), Response_Slot_Spacing set to 0x0A, and Num_Response_Slots set to 0x3 and receives a successful HCI_Command_Complete event in response.
3. The Upper Tester enables periodic advertising using the HCI_LE_Set_Periodic_Advertising_Enable command with the Enable parameter set to 0x01 (Periodic Advertising) and receives an HCI_Command_Complete event in response.
4. The Upper Tester enables advertising using the HCI_LE_Set_Extended_Advertising_Enable command and receives an HCI_Command_Complete event in response.
5. The IUT sends ADV_EXT_IND PDUs to the Lower Tester with AdvMode set to 0b00 and an AuxPtr and AUX_ADV_IND PDUs on the secondary advertising channel with AdvMode set to 0b00 and SyncInfo Extended Header fields.
6. The IUT sends an HCI_LE_Periodic_Advertising_Subevent_Data_Request event to the Upper Tester with Subevent_Start set to 0 and Subevent_Data_Count set to 1.
7. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Num_Subevents set to 1, Subevent set to 0, Response_Slot_Start set to 0, Response_Slot_Count set to 1, Subevent_Data_Length[0] set to 127, and Subevent_Data[0] set to 127 random bytes.
8. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x45 (Packet Too Long).
9. The IUT sends an HCI_LE_Periodic_Advertising_Subevent_Data_Request event to the Upper Tester with Subevent_Start set to 0 and Subevent_Data_Count set to 1.
10. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Num_Subevents set to 1, Subevent set to 0, Response_Slot_Start set to 0, Response_Slot_Count set to 0, Subevent_Data_Length[0] set to 127, and Subevent_Data[0] set to 127 random bytes.
11. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x45 (Packet Too Long).
12. The IUT sends an HCI_LE_Periodic_Advertising_Subevent_Data_Request event to the Upper Tester with Subevent_Start set to 0 and Subevent_Data_Count set to 1.
13. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Num_Subevents set to 1, Subevent set to 0, Response_Slot_Start set to 0, Response_Slot_Count set to 1, Subevent_Data_Length[0] set to 126, and Subevent_Data[0] set to 126 random bytes.
14. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
15. The IUT sends an AUX_SYNC_SUBEVENT_IND PDU to the Lower Tester on Subevent 1 with the Data from Step 13.

- Expected Outcome

Pass verdict

In Steps 8 and 11, the IUT sends an 0x45 error in the HCI_Command_Complete event to the Upper Tester.

In Step 14, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

In Step 15, the IUT advertises an AUX_SYNC_SUBEVENT_IND PDU to the Lower Tester on Subevent 1 with 126 bytes of data from Step 13.

HCI/DDI/BI-73-C [Reject LE Periodic Advertising Response Data Command, Advertising Duration Too Long]

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Periodic_Advertising_Response_Data command when the Advertising Duration is longer than the Periodic Advertising Subevent Delay.

- Reference

[\[12\]](#) 7.8.126

- Initial Condition

- State: The IUT is in Standby.

- Test Procedure

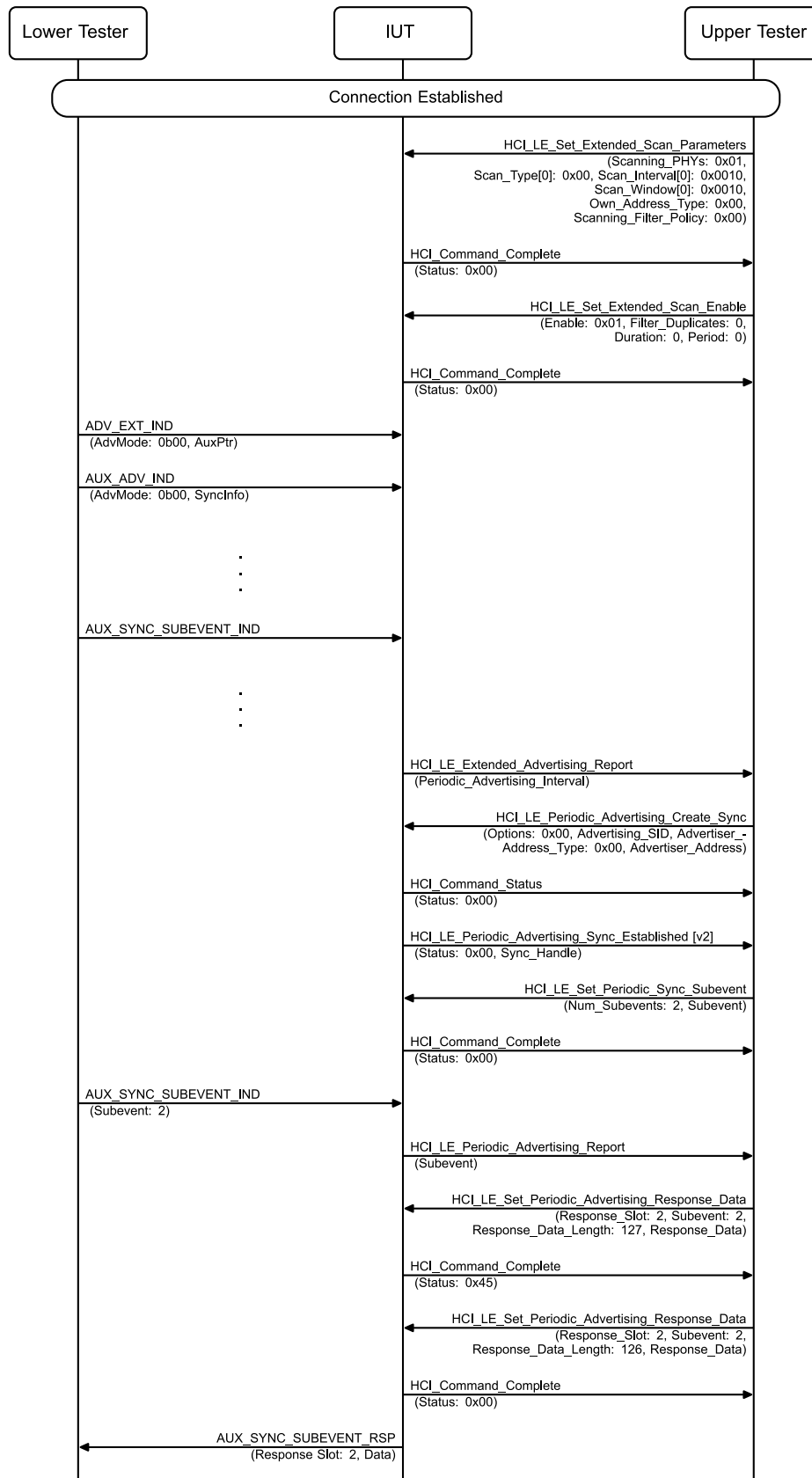


Figure 4.52: Reject LE Periodic Advertising Response Data Command, Advertising Duration Too Long MSC

1. The Upper Tester sends an HCI_LE_Set_Extended_Scan_Parameters command to the IUT and receives a successful HCI_Command_Complete event in return. The Scanning_PHYs parameter is set to 0x01 (LE 1M), Scan_Type[0] is set to 0x00 (Passive Scanning), Scan_Interval[0] is set to 0x0010, Scan_Window[0] is set to 0x0010, Own_Address_Type is set to 0x00 (Public Device Address), and Scanning_Filter_Policy is set to 0x00 (Accept All).
2. The Upper Tester sends an HCI_LE_Set_Extended_Scan_Enable command to the IUT to enable scanning and receives a successful HCI_Command_Complete event in return. Filter_Duplicates, Duration, and Period are all set to zero.
3. The Lower Tester begins advertising using ADV_EXT_IND and AUX_ADV_IND PDUs using the LE 1M PHY. The ADV_EXT_IND PDUs include an AuxPtr that refers to the AUX_ADV_IND PDUs on the secondary advertising channel. The AUX_ADV_IND PDUs include the AdvA field containing the Lower Tester address, a SyncInfo field referring to the AUX_SYNC_SUBEVENT_IND PDUs, and the ACAD type for the Periodic Advertising Response Timing Information with subeventInterval set to 318.75 ms (0xFF), responseSlotDelay set to 313.75 ms (0xFB), and responseSlotSpacing set to 1.25 ms (0x0A). The Lower Tester continues advertising until directed to stop in the test procedure.
4. The Lower Tester is advertising using 5 Subevents, generating AUX_SYNC_SUBEVENT_IND PDUs on the secondary advertising channel using the indices selected by the LE Channel Selection Algorithm #2 as specified in the SyncInfo in Step 3.
5. The IUT sends an HCI_LE_Extended_Advertising_Report event to the Upper Tester containing a non-zero Periodic_Advertising_Interval.
6. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT to synchronize with the Lower Tester's periodic advertisements and receives an HCI_Command_Status event in response. Options is set to 0x00 (Don't Use List, Reporting Initially Enabled, Duplicate Filtering Disabled), Advertising_SID is set to the Advertising_SID from Step 5, Advertiser_Address_Type is set to 0x00 (Public Device Address), Advertiser_Address is set to the Lower Tester's address.
7. The IUT sends an HCI_LE_Periodic_Advertising_Sync_Established [v2] to the Upper Tester containing a Sync_Handle, a Status of 0x00 (Success), and other fields matching the advertisements generated by the Lower Tester.
8. The Upper Tester sends an HCI_LE_Set_Periodic_Sync_Subevent command to the IUT to synchronize with the Lower Tester's periodic advertisements, with Num_Subevents set to 2, the Subevent field array set to [2, 4], and the Upper Tester receives a successful HCI_Command_Complete event in response.
9. The Lower Tester generates AUX_SYNC_SUBEVENT_IND PDUs with 10 bytes of random Subevent data for the PDU corresponding to Subevent 2.
10. The IUT sends an HCI_LE_Periodic_Advertising_Report [v2] event to the Upper Tester with Subevent set to the subevent of the received AUX_SYNC_SUBEVENT_IND PDU.
11. For the report that contains Data_Length > 0, the Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Response_Data command to the IUT with Response_Slot set to 2, Subevent set to 2, and Response_Data_Length set to 127, and Response_Data contains 127 random octets.
12. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x45 (Packet Too Long).
13. Repeat Steps 9 to 11 except that Response_Data_Length is set to 126 and Response_Data contains 126 random octets.
14. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
15. The IUT sends an AUX_SYNC_SUBEVENT_RSP PDU to the Lower Tester in response slot 2 and with the response data from Step 13.

- Expected Outcome

Pass verdict

In Step 12, the IUT sends an 0x45 error in the HCI_Command_Complete event to the Upper Tester.

In Step 14, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

In Step 15, the IUT sends an AUX_SYNC_SUBEVENT_RSP PDU to the Lower Tester in response slot 2 and with the response data from Step 13.'

HCI/DDI/BV-10-C [LE Set Resolvable Private Address Timeout v2 Range]

- Test Purpose

Verify that the controller changes the Resolvable Private Address between the specified min and max timeout. The IUT sends advertisements and changes the AdvA at random times.

- Reference

[22] 7.8.45

- Initial Condition

- The IUT is in STANDBY mode.

- Test Procedure

1. The Upper Tester sends the HCI_LE_Add_Device_To_Resolving_List command to the IUT with PeerIRK set to 0 and Local_IRK set to the local IRK and receives a successful HCI_Command_Complete event in response.
2. The Upper Tester sends the HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command to the IUT with RPA_Timeout_Min set to 0x0001 and RPA_Timeout_Max set to 0xB4 (180 s) and receives a successful HCI_Command_Complete event in response.
3. The Upper Tester sends an HCI_LE_Set_Advertising_Parameters command to the IUT with Advertising_Interval_Min and Advertising_Interval_Max set to 250 ms, Advertising_Type set to 0x00, and Own_Address_Type set to 0x02 and receives a successful HCI_Command_Complete event in response.
4. The Upper Tester sends an HCI_LE_Set_Advertising_Data command to the IUT with Data_Length set to 0 and receives a successful HCI_Command_Complete event in response.
5. The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT with Enable set to 0x01 and receives a successful HCI_Command_Complete event in response.
6. The IUT starts sending ADV_IND PDUs to the Lower Tester with AdvA set.
7. The Lower Tester receives the ADV_IND PDUs and confirms that the AdvA changes between the RPA_Timeout_Min and RPA_Timeout_Max in Step 2.
8. Repeat Step 7 until the AdvA changes 10 times.

- Expected Outcome

Pass verdict

In Step 7, the IUT changes the AdvA for the ADV_IND PDU in the time between RPA_Timeout_Min and RPA_Timeout_Max in Step 3 since the most recent update or, for the first update, since Step 5 was performed.

The mean of the 10 times for changing the AdvA is between 58 seconds and 124 seconds (inclusive).

Fail verdict

The IUT does not change the AdvA in the ADV_IND PDU.

The IUT changes the AdvA in the ADV_IND PDU shorter than RPA_Timeout_Min or longer than RPA_Timeout_Max.

More than 2 of the 10 timeout values are the same.

HCI/DDI/BV-11-C [Default Advertising Interval Min and Max for Randomized Resolvable RPA Timeout]

- Test Purpose

Verify that the controller changes the Resolvable Private Address using the default min and max timeout value when the Host does not call the LE Set Resolvable Private Address Timeout [v2] command. The IUT sends advertisements and changes the AdvA at random times.

- Reference

[22] 7.8.45

- Initial Condition

- The IUT is in STANDBY mode.

- Test Procedure

1. The Upper Tester sends the HCI_LE_Add_Device_To_Resolving_List command to the IUT with PeerIRK set to 0 and Local_IRK set to the local IRK and receives a successful HCI_Command_Complete event in response.
2. The Upper Tester sends an HCI_LE_Set_Advertising_Parameters command to the IUT with Advertising_Interval_Min and Advertising_Interval_Max set to 250 ms, Advertising_Type set to 0x00, and Own_Address_Type set to 0x02 and receives a successful HCI_Command_Complete event in response.
3. The Upper Tester sends an HCI_LE_Set_Advertising_Data command to the IUT with Data_Length set to 0 and receives a successful HCI_Command_Complete event in response.
4. The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT with Enable set to 0x01 and receives a successful HCI_Command_Complete event in response.
5. The IUT starts sending ADV_IND PDUs to the Lower Tester with AdvA set.
6. The Lower Tester receives the ADV_IND PDUs and confirms that the AdvA changes between the default.
7. Repeat Step 6 until the AdvA changes five times.

- Expected Outcome

Pass verdict

In Step 6, the IUT changes the AdvA for the ADV_IND PDU in the time between 8 and 15 minutes since the most recent update or, for the first update, since Step 4 was performed.

The mean of the 10 times for changing the AdvA is between 580 seconds and 800 seconds (inclusive).

Each of the timeouts in the repeats is different.

Fail verdict

The IUT does not change the AdvA in the ADV_IND PDU.

The IUT changes the AdvA in the ADV_IND PDU shorter than 8 minutes or longer than 14 minutes.

HCI/DDI/BI-74-C [LE Set Resolvable Private Address Timeout v2, Invalid Parameters]

- Test Purpose

Verify that the controller rejects an LE Set Resolvable Private Address Timeout [v2] command with invalid timeout parameters.

- Reference

[22] 7.8.45

- Initial Condition

- The IUT is in STANDBY mode.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.24](#).

1. The Upper Tester sends the HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command to the IUT with RPA_Timeout_Max and RPA_Timeout_Min set to the values in [Table 4.24](#).
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.
3. The Upper Tester sends the HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command to the IUT with RPA_Timeout_Max set to 1 and RPA_Timeout_Min set to 0x0E10.
4. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

Repeat Steps 5 and 6 ten times.

5. The Upper Tester sends the HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command to the IUT with random RPA_Timeout_Max and RPA_Timeout_Min values with the condition $1 \leq \text{RPA_Timeout_Max} < \text{RPA_Timeout_Min} \leq 0x0E10$.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.

Round	Timeout Min	Timeout Max
1	0	1
2	0	0
3	0x0E0F	0x0E11
4	0x0E11	0x1000
5	0	0x0E10
6	1	0xFFFF
7	2	1

Table 4.24: LE Set Resolvable Private Address Timeout v2, Invalid Parameters rounds

- Expected Outcome

Pass verdict

In Steps 2 and 6, the IUT responds with an 0x12 error code.

In Step 4, the IUT sends a successful event.

HCI/DDI/BV-12-C [Connect to one periodic advertising train, Periodic Advertiser List]

- Test Purpose

Verify that the IUT only synchronizes to one periodic advertising train for each address, address type, and Advertising SID.

- Reference

[\[12\]](#) 7.8.67

- Initial Condition

- The Lower Tester is advertising with three periodic advertisements, PA1, PA2, and PA3. All three have the same Advertising Address, Advertising Address Type, and SID. PA1, PA2, and PA3 have periodic advertisement intervals of 20 ms, 25 ms, and 30 ms. The first PA2 is offset from PA1 by 2 ms, and the first PA3 is offset from PA1 by 5 ms.
- The IUT is scanning for extended advertising and is receiving SyncInfo for all three advertisements.

- Test Procedure

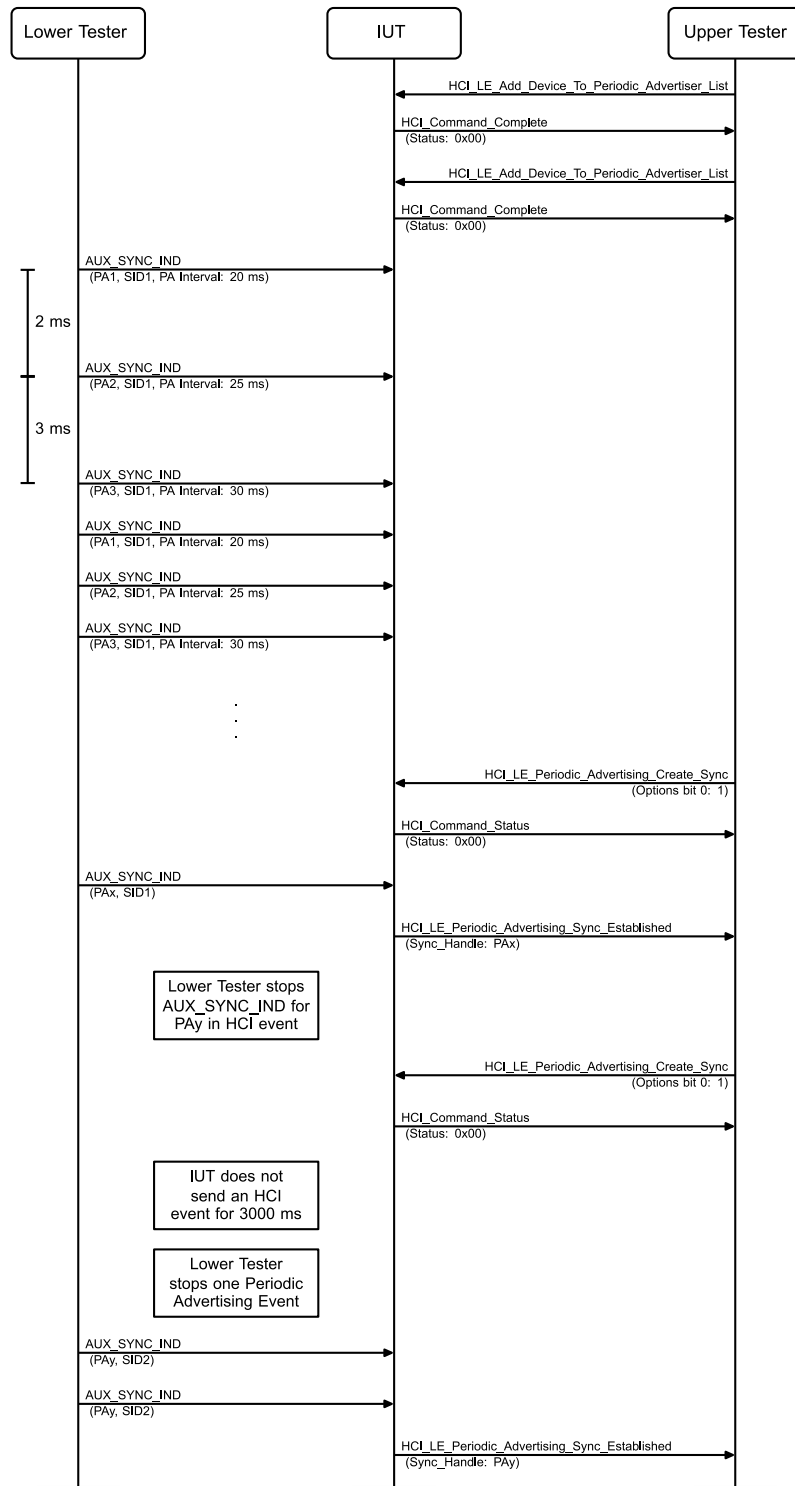


Figure 4.53: HCI/DDI/BV-12-C [Connect to one periodic advertising train, Periodic Advertiser List] MSC

1. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with information from the periodic advertising and receives a successful HCI_Command_Complete event in response.
2. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with information from the periodic advertising with a different SID than in Step 1 but with the

- same address and address type as in Step 1 and receives a successful HCI_Command_Complete event in response.
3. The Lower Tester sends advertisement PDUs as specified in the Initial Condition. The Advertising_SID and Advertiser_Address are different for each advertisement.
 4. After all the advertisements have started, the Upper Tester randomly sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT with the Lower Tester's periodic advertisement values and with bit 0 of the Options parameter set to 1 and receives a successful HCI_Command_Status in response.
 5. When the IUT synchronizes with the periodic advertisement, the IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with Periodic_Advertising_Interval. The Periodic_Advertising_Interval identifies the Periodic Advertiser that is synced.
 6. The Lower Tester stops advertising the PA train identified in Step 5.
 7. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT with the Lower Tester's periodic advertisement values and with bit 0 of the Options parameter set to 1 and receives a successful HCI_Command_Status in response.
 8. For 3000 ms, the IUT does not synchronize with a periodic advertisement and does not send an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester.
 9. The Lower Tester stops one of the other two Periodic Advertisements.
 10. The Lower Tester changes the SID of the Periodic Advertisement in Step 9 to the SID in Step 2.
 11. The Lower Tester starts advertising the SID of the Periodic Advertisement in Step 10.
 12. When the IUT synchronizes with the periodic advertisement in Step 10, the IUT sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester with a Periodic_Advertising_Interval. The Periodic_Advertising_Interval matches the periodic advertisement that was changed in Step 10.
- Expected Outcome
- Pass verdict
- In Step 5, the IUT synchronizes with one of the Periodic Advertisements and sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester.
- In Step 8, the IUT does not send an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester.
- In Step 12, the IUT synchronizes with the Periodic Advertisement from Step 10 and sends an HCI_LE_Periodic_Advertising_Sync_Established event to the Upper Tester.

4.8 Host Flow Control

Verify the correct implementation of the Host flow control commands.

HCI/HFC/BV-01-C [Set_Event_Mask Command]

- Test Purpose

Verify that the *Set_Event_Mask* command controls which events are generated by the IUT.
- Reference

[1] 7.3.1
- Initial Condition
 - The IUT must be configured as Central.
 - The IUT is in STANDBY mode.



- Test Procedure

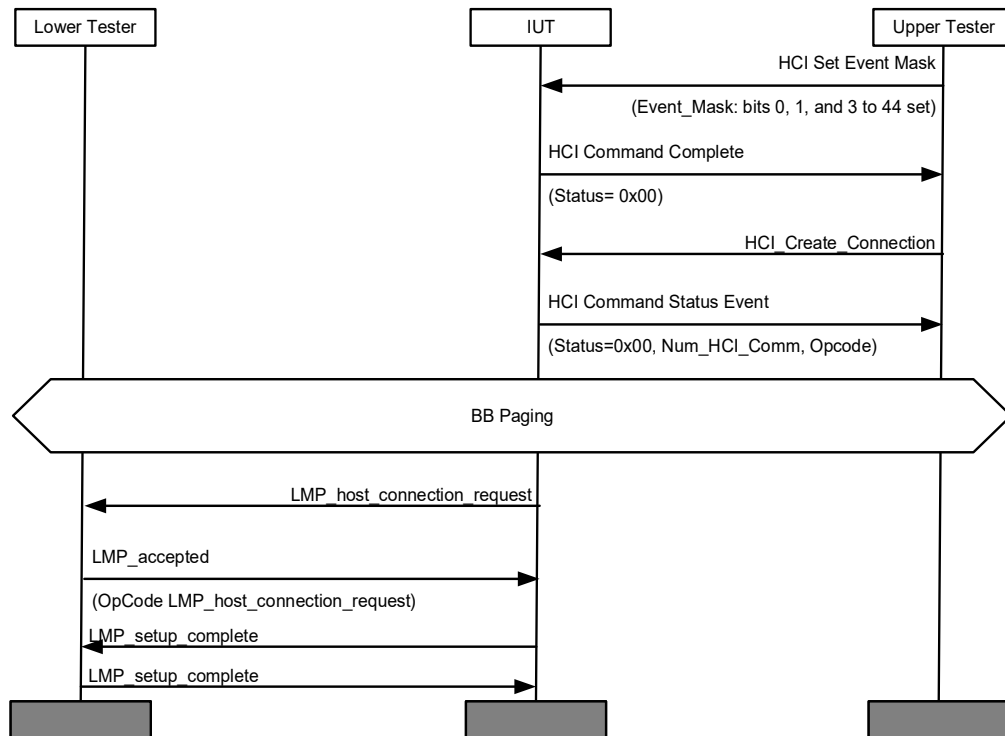


Figure 4.54: HCI/HFC/BV-01-C [*Set_Event_Mask* Command] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Mask* command.

The IUT does not return a 'Connection Complete' event.

HCI/HFC/BV-02-C [*Set_Event_Filter* Command]

- Test Purpose

Verify that the *Set_Event_Filter* command controls which events are generated using filters.

- Reference

[1] 7.3.3

- Initial Condition

- The IUT must be configured as Peripheral.
- The IUT is in STANDBY mode.

- Test Procedure

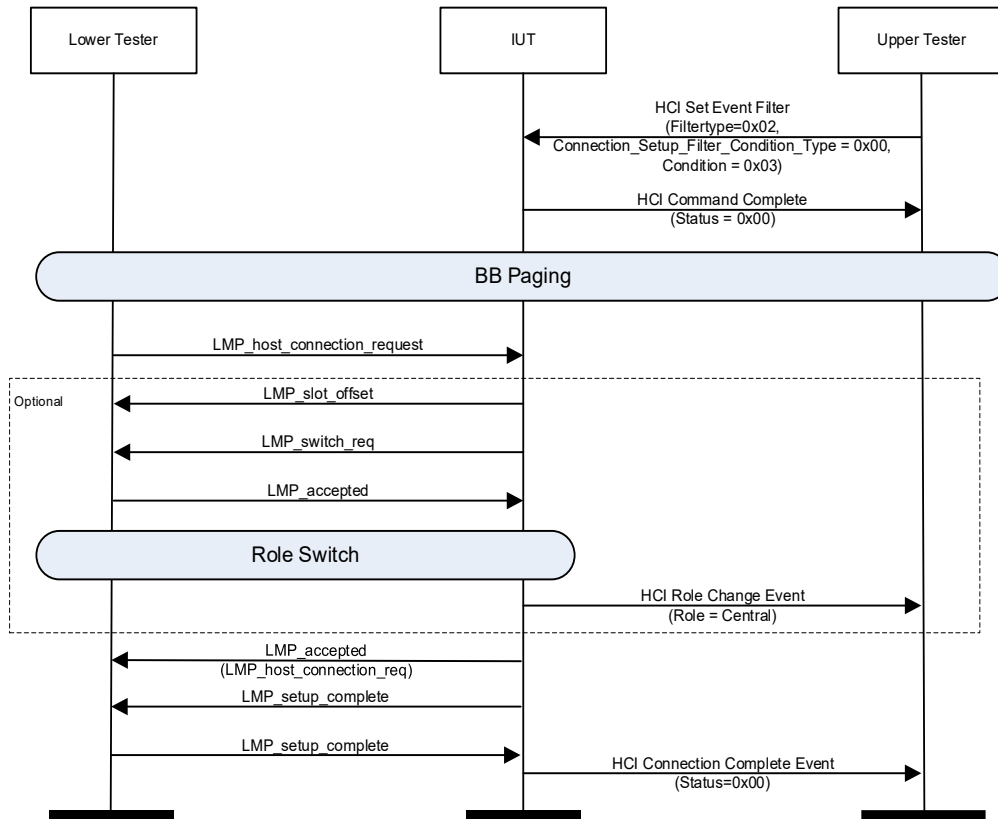


Figure 4.55: HCI/HFC/BV-02-C [*Set_Event_Filter* Command] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Filter* command.

The IUT does not return a 'Connection Request' event.

The IUT returns a 'Role Change' event with role as Central if role switch is supported.

The IUT does return a 'Connection Complete' event.

HCI/HFC/BV-03-C [*Set_Event_Mask_Page_2* Command]

- Test Purpose

Verify that the *Set Event Mask Page 2* command controls which events are generated by the IUT.

- Reference

[1] 7.3.69

- Initial Condition

- The IUT is connected to the Lower Tester.

- Test Procedure

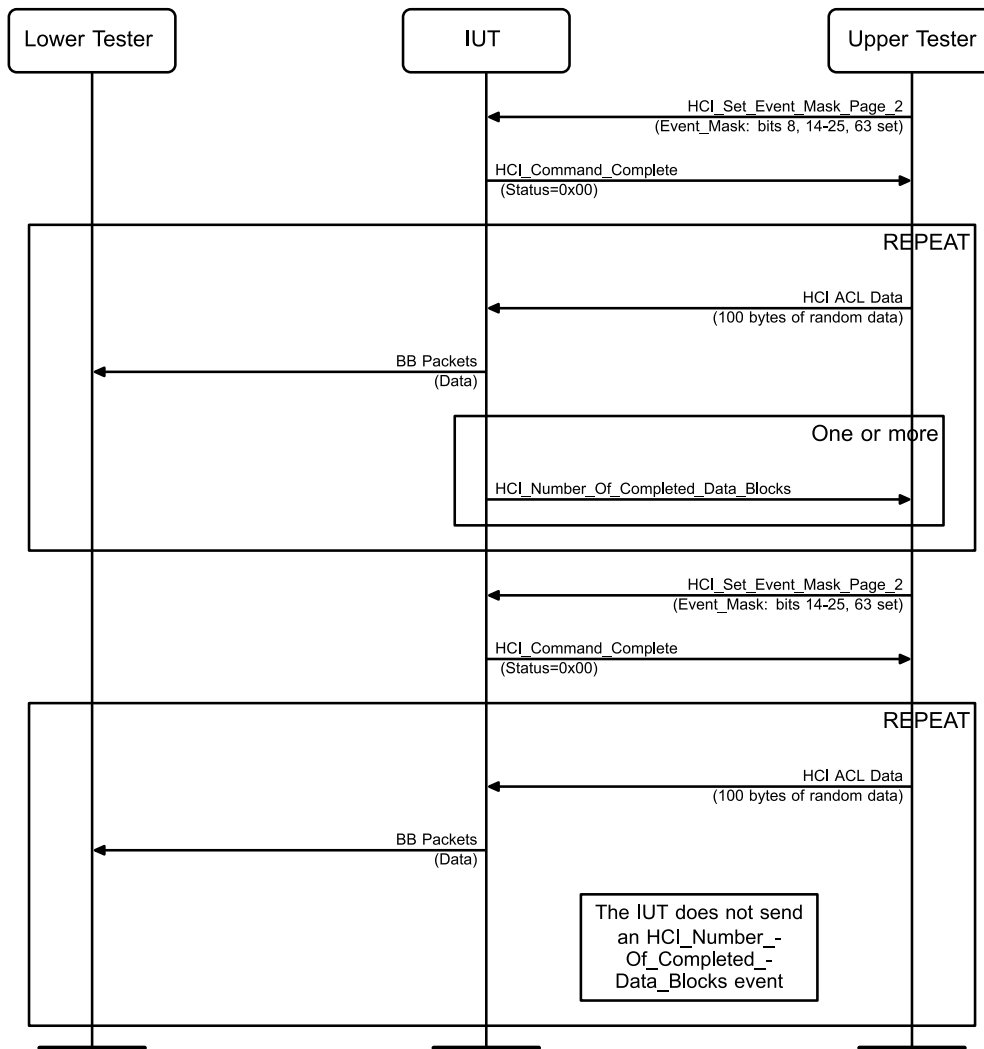


Figure 4.56: HCI/HFC/BV-03-C [Set_Event_Mask_Page_2 Command] MSC

1. The Upper Tester sends an HCI_Set_Event_Mask_Page_2 command to the IUT with Event_Mask_Page_2 bits 8, 14–25, and 63 set and receives a successful HCI_Command_Complete event in response.
2. The Upper Tester sends HCI ACL Data packets to the controller with 100 bytes of random data.
3. The IUT sends one or more BB packets containing the data from Step 2.
4. The IUT sends one or more HCI_Number_Of_Completed_Data_Blocks event(s) to the Upper Tester.
5. Repeat Steps 6–9 10 times.
6. The Upper Tester sends an HCI_Set_Event_Mask_Page_2 command to the IUT with Event_Mask_Page_2 bits 14–25 and 63 set and receives a successful HCI_Command_Complete event in response.
7. The Upper Tester sends HCI ACL Data packets to the controller with 100 bytes of random data.
8. The IUT sends one or more BB packets containing the data from Step 2.
9. The IUT does not send any HCI_Number_Of_Completed_Data_Blocks events to the Upper Tester.

- Expected Outcome

Pass verdict

In Steps 1 and 6, the IUT returns 'command complete' succeeded to the HCI_Set_Event_Mask_Page_2 command.

In Step 4, the IUT sends one or more HCI_Number_Of_Completed_Data_Blocks events to the Upper Tester.

Fail verdict

In Step 9, the IUT sends one or more HCI_Number_Of_Completed_Data_Blocks events to the Upper Tester.

4.8.1 LE Set Event Mask – Scanning state

- Test Purpose

Verify that the HCI_LE_Set_Event_Mask command controls which events are generated by the IUT when scanning is supported.

- Reference

[8] 7.3.1, 7.8.1

- Initial Condition

- No LL connection exists.
- The Lower Tester is configured to begin Advertising.
- The IUT is configured to begin Passive Scanning.

- Test Case Configuration

Test Case	HCI Command
HCI/HFC/BV-04-C [LE Set Event Mask – Scanning state, v1]	HCI_LE_Set_Event_Mask [v1]
HCI/HFC/BV-20-C [LE Set Event Mask – Scanning state, v2]	HCI_LE_Set_Event_Mask [v2]

Table 4.25: LE Set Event Mask – Scanning state test cases

- Test Procedure

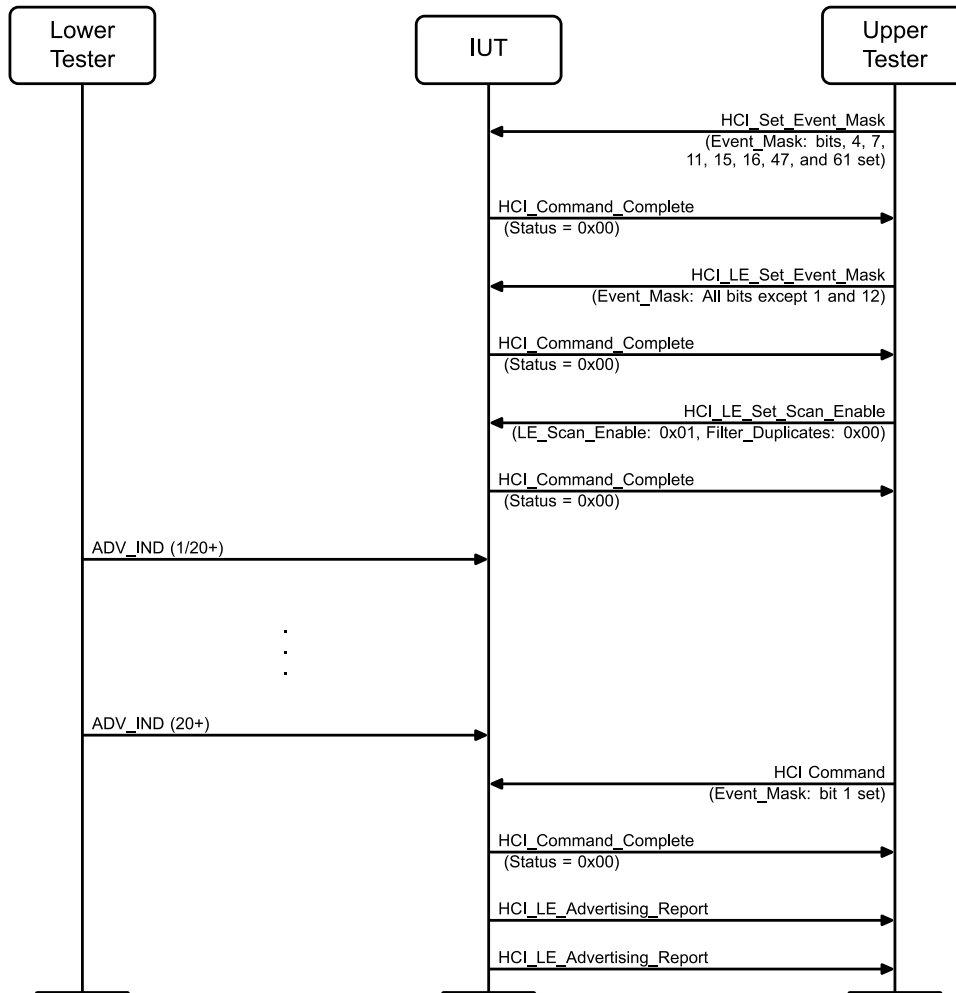


Figure 4.57: LE Set Event Mask – Scanning state MSC

1. The Upper Tester sends an HCI_Set_Event_Mask command to the IUT with Event_Mask bits 4, 7, 11, 15, 16, 47, and 61 set and receives a successful HCI_Command_Complete in response.
2. The Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.25](#) to the IUT with all Event_Mask bits set except for 1 and 12 and receives a successful HCI_Command_Complete in response.
3. The Upper Tester sends an HCI_LE_Set_Scan_Enable with LE_Scan_Enable set to 0x01 and Filter_Duplicates set to 0x00 and receives a successful HCI_Command_Complete in response.
4. The Lower Tester begins advertising.
5. After at least 20 advertisements, the Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.25](#) to the IUT with Event_Mask bit 1 set and receives a successful HCI_Command_Complete in response.
6. The IUT sends at least two LE Advertising Report events.

- Expected Outcome

Pass verdict

The IUT returns HCI_Command_Complete event with Status = Success.

Before Step 5, the IUT does not send HCI LE Advertising Report events.

In Step 6, the IUT sends at least two LE Advertising Report events.

4.8.2 LE Set Event Mask – Initiating state

- Test Purpose

Verify that the HCI_LE_Set_Event_Mask command controls which events are generated by the IUT when the Initiating state is supported.

- Reference

[8] 7.3.1, 7.8.1

- Initial Condition

- No LL connection exists.
- The Lower Tester sends connectable advertisements throughout the test.

- Test Case Configuration

Test Case	HCI Command
HCI/HFC/BV-14-C [LE Set Event Mask – Initiating state, v1]	HCI_LE_Set_Event_Mask [v1]
HCI/HFC/BV-21-C [LE Set Event Mask – Initiating state, v2]	HCI_LE_Set_Event_Mask [v2]

Table 4.26: LE Set Event Mask – Initiating state test cases

- Test Procedure

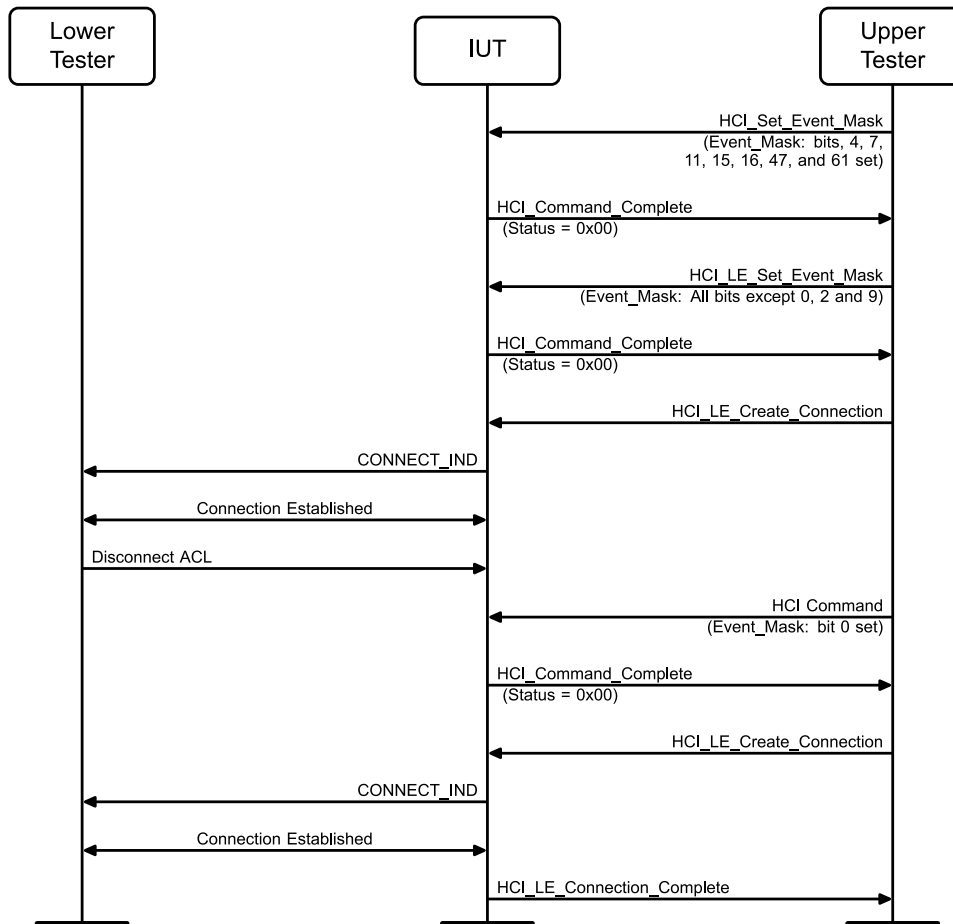


Figure 4.58: LE Set Event Mask – Initiating state MSC

1. The Upper Tester sends an HCI_Set_Event_Mask command to the IUT with Event_Mask bits 4, 7, 11, 15, 16, 47, and 61 set and receives a successful HCI_Command_Complete in response.
2. The Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.26](#) to the IUT with all Event_Mask bits set except for 0, 2, 9, and 40 and receives a successful HCI_Command_Complete in response.
3. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT with valid parameters.
4. The IUT sends a CONNECT_IND PDU to the Lower Tester.
5. The Lower Tester and the IUT establish an ACL connection.
6. The Lower Tester disconnects the connection.
7. The Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.26](#) to the IUT with Event_Mask bit 0 set and receives a successful HCI_Command_Complete in response.
8. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT with valid parameters.
9. The IUT sends a CONNECT_IND PDU to the Lower Tester.
10. The Lower Tester and the IUT establish an ACL connection.
11. The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event with Status = Success.

In Step 5, the IUT does not send an HCI LE Connection Complete event.

In Step 11, the IUT sends an HCI LE Connection Complete event after the connection is established.

4.8.3 LE Set Event Mask – Advertising state and connections supported

- Test Purpose

Verify that the HCI_LE_Set_Event_Mask command controls which events are generated by the IUT when the Advertising state is supported.

- Reference

[8] 7.3.1, 7.8.1

- Initial Condition

- No LL connection exists.
- The IUT is configured to begin connectable Advertising.
- The Lower Tester is configured to begin Active Scanning.

- Test Case Configuration

Test Case	HCI Command
HCI/HFC/BV-15-C [LE Set Event Mask – Advertising state and connections supported, v1]	HCI_LE_Set_Event_Mask [v1]
HCI/HFC/BV-22-C [LE Set Event Mask – Advertising state and connections supported, v2]	HCI_LE_Set_Event_Mask [v2]

Table 4.27: LE Set Event Mask - Advertising state and connections supported test cases

- Test Procedure

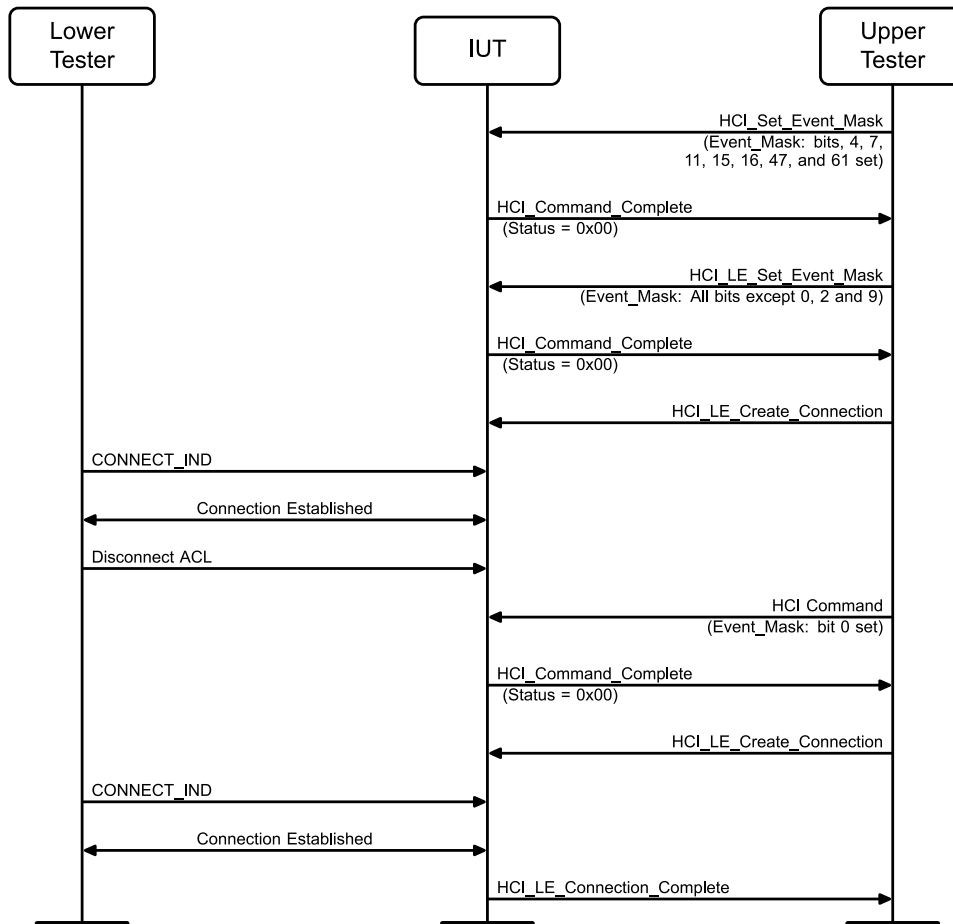


Figure 4.59: LE Set Event Mask – Advertising state and connections supported MSC

1. The Upper Tester sends an HCI_Set_Event_Mask command to the IUT with Event_Mask bits 4, 7, 11, 15, 16, 47, and 61 set and receives a successful HCI_Command_Complete in response.
2. The Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.27](#) to the IUT with all Event_Mask bits set except for 0, 2, 9, and 40 and receives a successful HCI_Command_Complete in response.
3. The Upper Tester sends an HCI_LE_Set_Advertising_Enable with Advertising_Enable set to 0x01 and receives a successful HCI_Command_Complete in response.
4. The IUT begins sending ADV_IND PDUs to the Lower Tester.
5. The Lower Tester sends a CONNECT_IND PDU to the IUT.
6. The IUT and the Lower Tester establish an ACL connection, but the IUT does not notify the Upper Tester.
7. The Lower Tester disconnects the connection.
8. The Upper Tester sends an HCI_LE_Set_Event_Mask command version specified in [Table 4.27](#) to the IUT with Event_Mask bit 0 set and receives a successful HCI_Command_Complete in response.
9. The Lower Tester sends a CONNECT_IND PDU to the IUT.
10. The IUT and the Lower Tester establish an ACL connection.
11. The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Complete event with Status = Success.

Before Step 8, the IUT does not send HCI LE Advertising Report events.

In Step 11, the IUT sends an HCI_LE_Connection_Complete event.

4.8.4 LE Set Event Mask – Key Event

- Test Purpose

Verify that the LE Set Event Mask command masks the specified HCI Key event.

- Initial Condition

- The IUT is in STANDBY mode.

- Test Case Configuration

Test Case	Reference	Event Mask Bit	HCI Command/Event
HCI/HFC/BV-17-C [LE Set Event Mask – Key Event, LE Read Local P-256 Public Key]	[8] 7.3.1, 7.7.65.8, 7.8.1	7	HCI_LE_Read_Local_P-256_Public_Key HCI_LE_Read_Local_P-256_Public_Key_Complete
HCI/HFC/BV-18-C [LE Set Event Mask – Key Event, LE Generate DHKey [v1]]	[8] 7.3.1, 7.7.65.9, 7.8.1	8	HCI_LE_Generate_DHKey[v1] HCI_LE_Generate_DHKey_Complete

Table 4.28: LE Set Event Mask – Key Event test cases

- Test Procedure

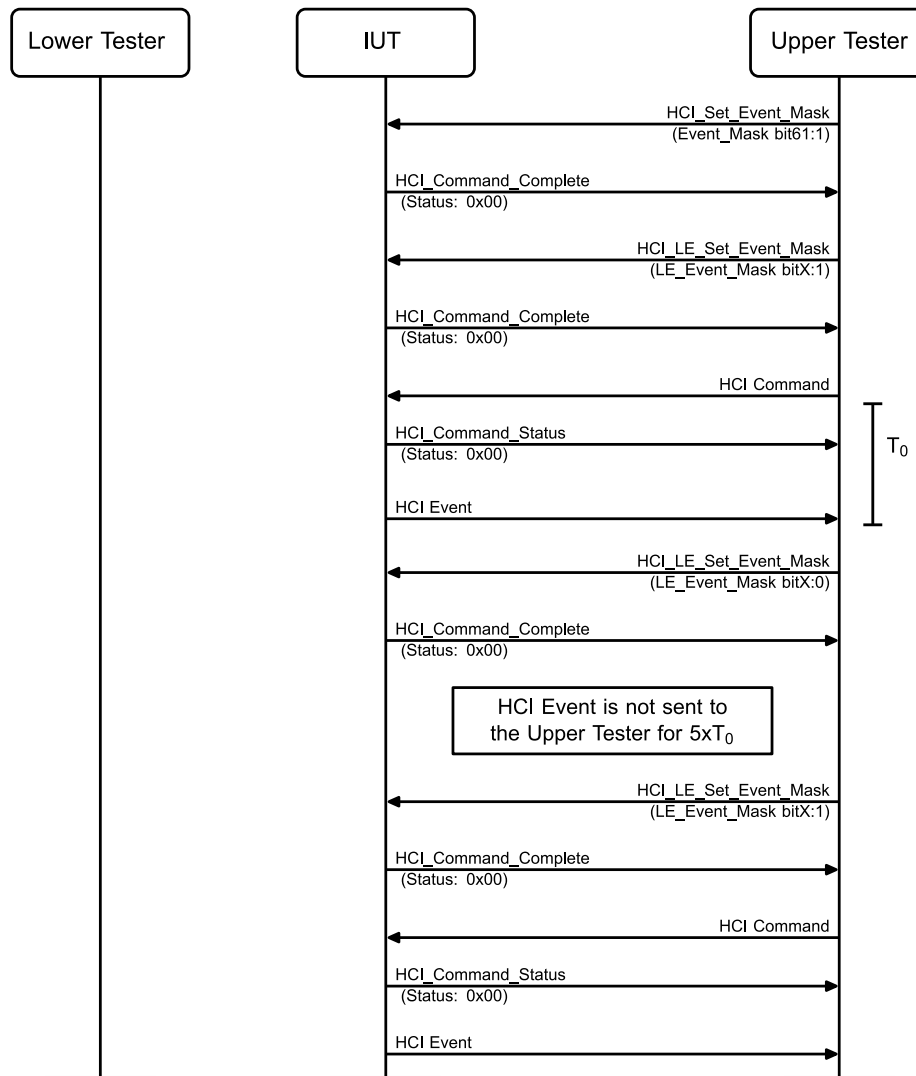


Figure 4.60: LE Set Event Mask – Key Event MSC

1. The Upper Tester sends an HCI_Set_Event_Mask command to the IUT with Event_Mask bit 61 set to 1 and receives a successful HCI_Command_Complete in response.
2. The Upper Tester sends an HCI_LE_Set_Event_Mask command to the IUT with the LE_Event_Mask bit specified in Table 4.28 set to 1 and receives a successful HCI_Command_Complete in response.
3. The Upper Tester sends the HCI command specified in Table 4.28 to the IUT. The tester notes the time this event is sent by the Upper Tester.
4. The IUT sends a successful HCI_Command_Status event to the Upper Tester.
5. The IUT sends a successful HCI event specified in Table 4.28 to the Upper Tester. The tester notes the time this event is received by the Upper Tester.
6. The Upper Tester sends an HCI_LE_Set_Event_Mask command to the IUT with LE_Event_Mask set to 0 and receives a successful HCI_Command_Complete in response.
7. The Upper Tester sends the HCI command specified in Table 4.28 to the IUT.
8. The IUT sends a successful HCI_Command_Status event to the Upper Tester.

9. The IUT does not send the HCI event specified in [Table 4.28](#) to the Upper Tester. Wait for five times the time span between the times noted in Steps 3 and 5 to confirm this.
10. Repeat Steps 2–5.

- Expected Outcome

Pass verdict

In Step 5, the IUT sends the HCI event specified in [Table 4.28](#) to the Upper Tester.

In Step 9, the IUT does not send the HCI event specified in [Table 4.28](#).

HCI/HFC/BV-19-C [LE Set Event Mask – Advertising Set Terminated event]

- Test Purpose

Verify that the LE Set Event Mask command masks the LE Advertising Set Terminated event.

- Reference

[8] 7.3.1, 7.7.65.18, 7.8.1

- Initial Condition

- The IUT is in STANDBY mode.

- Test Procedure

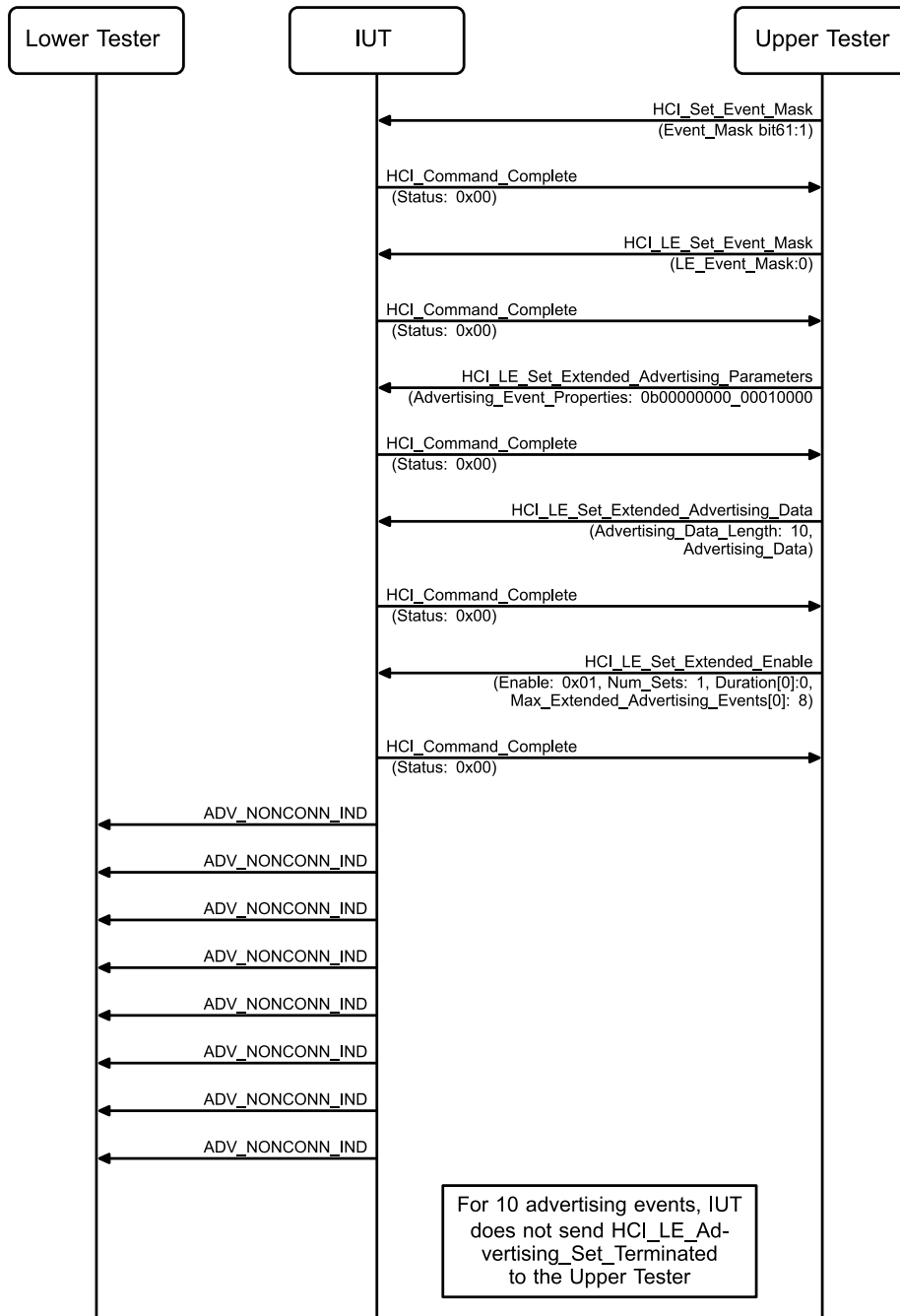


Figure 4.61: HCI/HFC/BV-19-C [LE Set Event Mask – Advertising Set Terminated] MSC – Page 1 of 2

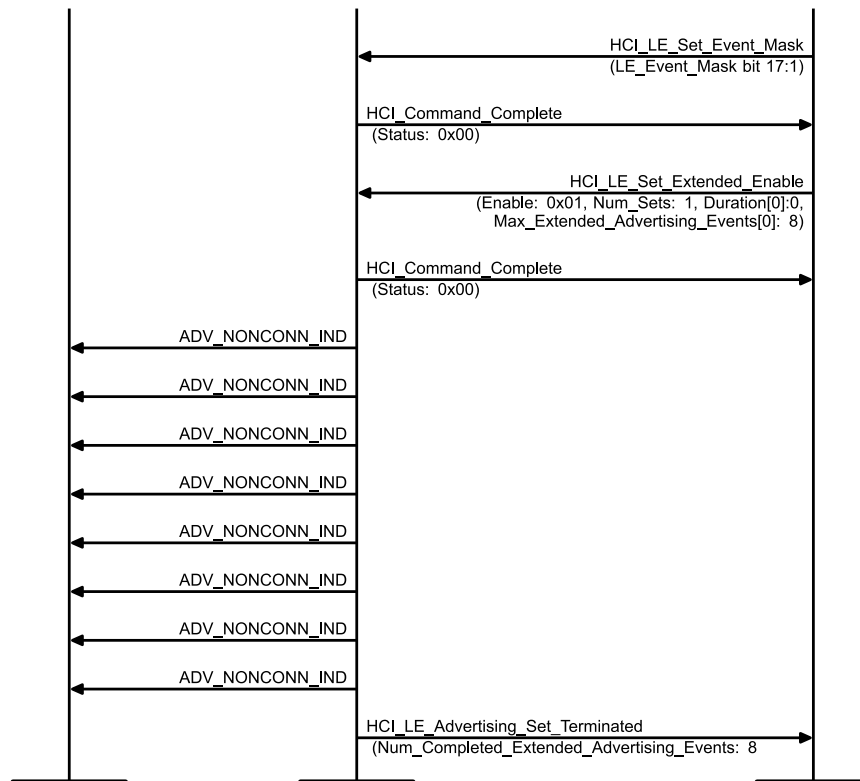


Figure 4.62: HCI/HFC/BV-19-C [LE Set Event Mask – Advertising Set Terminated] MSC – Page 2 of 2

1. The Upper Tester sends an HCI_Set_Event_Mask command to the IUT with Event_Mask bit 61 set to 1 and receives a successful HCI_Command_Complete in response.
2. The Upper Tester sends an HCI_LE_Set_Event_Mask command to the IUT with LE_Event_Mask set to 0 and receives a successful HCI_Command_Complete in response.
3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with Advertising_Event_Properties set to 0b00000000_00010000 and receives a successful HCI_Command_Complete event in response.
4. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Data command to the IUT with Advertising_Data_Length set to 10 and Advertising_Data set to 10 random octets and receives a successful HCI_Command_Complete event in response.
5. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Enable command to the IUT with Enable set to 1, Num_Sets set to 1, Duration [0] set to 0, and Max_Extended_Advertising_Events[0] set to 8 and receives a successful HCI_Command_Complete event in response.
6. The IUT sends exactly eight ADV_NONCONN_IND PDUs to the Lower Tester.
7. For 10 advertising events after Step 6, the IUT does not send an HCI_LE_Advertising_Set_Terminated event to the Upper Tester.
8. The Upper Tester sends an HCI_LE_Set_Event_Mask command to the IUT with LE_Event_Mask bit 17 set to 1 and receives a successful HCI_Command_Complete in response.
9. Repeat Steps 5 and 6.
10. The IUT sends an HCI_LE_Advertising_Set_Terminated event to the Upper Tester with Num_Completed_Extended_Advertising_Events set to 8.

- Expected Outcome

Pass verdict

In Step 7, the IUT does not send an HCI_LE_Advertising_Set_Terminated event to the Upper Tester.

In Step 10, the IUT sends an HCI_LE_Advertising_Set_Terminated event to the Upper Tester.

Fail verdict

In Step 6, the IUT sends fewer or more than eight PDUs to the Lower Tester.

HCI/HFC/BV-05-C [Set_Event_Filter Command to perform auto accept connection from configured and specified bd address over ACL]

- Test Purpose

Verify that the *Set_Event_Filter* command can perform auto accept connection from configured and specified bd address.

- Reference

[1] 7.3.3

- Initial Condition

- The IUT configured as Peripheral.
- The IUT is in STANDBY mode.
- BD address of the Lower Tester is set in HCI Set Event Filter.

- Test Procedure

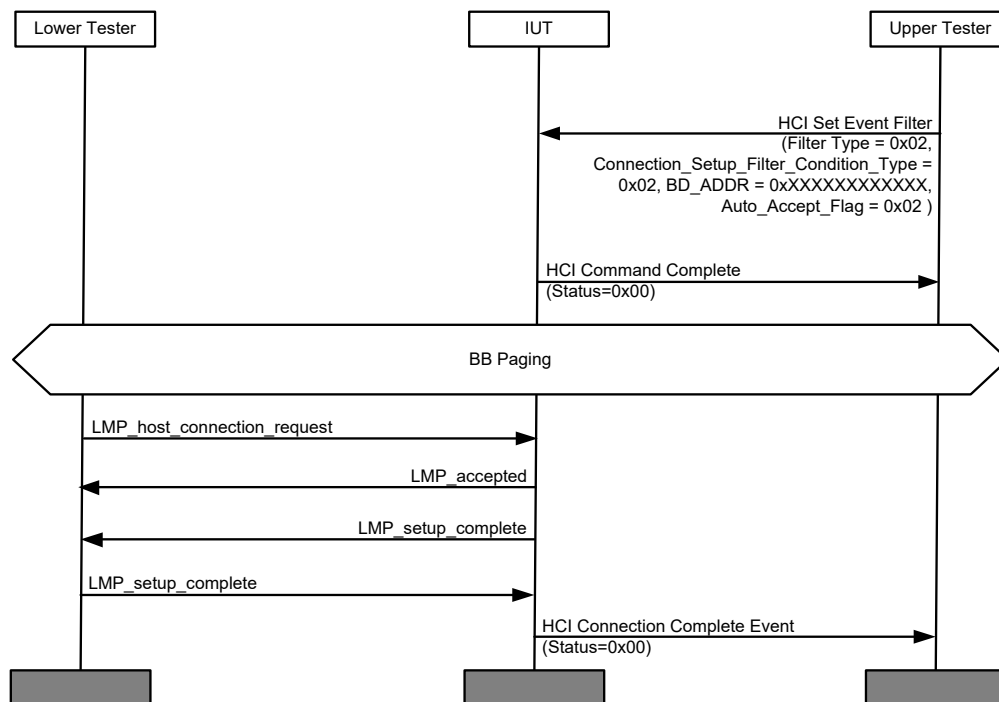


Figure 4.63: HCI/HFC/BV-05-C [Set_Event_Filter Command to perform auto accept connection from configured and specified bd address over ACL] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Set_Event_Filter command.

The IUT does not return a 'Connection Request' event.

The IUT does not perform role switch.

The IUT does return a 'Connection Complete' event.

HCI/HFC/BV-06-C [Set_Event_Filter Command, connection request rejection]

- Test Purpose

Verify that the *Set_Event_Filter* command leads to connection request rejection from peer device which is not specified for auto accept in the filter condition.

- Reference

[1] 7.3.3

- Initial Condition

- The IUT configured as Peripheral.
- The IUT is in STANDBY mode.
- BD address of the Lower Tester is **NOT** set in HCI Set Event Filter.

- Test Procedure

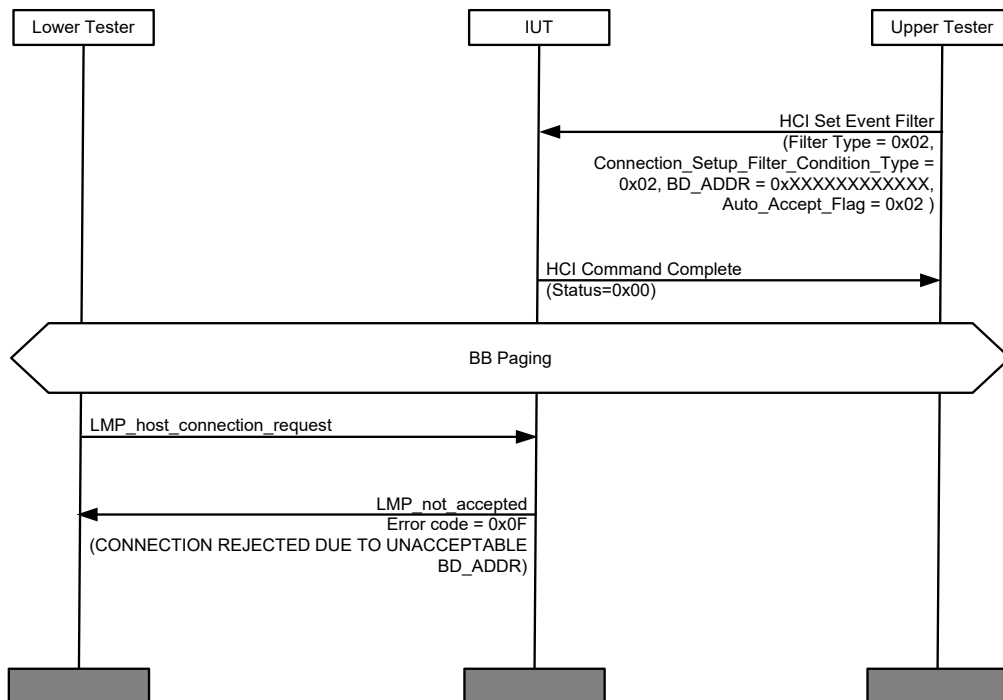


Figure 4.64: HCI/HFC/BV-06-C [Set_Event_Filter Command, connection request rejection] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Filter* command.

The IUT does not return a 'Connection Request' event.

The IUT does not perform role switch.

The IUT does not return a 'Connection Complete' event.

HCI/HFC/BV-07-C [Set_Event_Filter Command, Host configures the Controller to Allow Connections, specifying a Class of Device and a Class of Device Mask]

- Test Purpose

Verify that the *Set_Event_Filter* command controls which events are generated using filters.

In this test Host configure the Controller to Allow Connections from the Lower Tester, specifying a Class of Device and a Class of Device Mask. For this condition, the Auto Accept Flag is set to Do auto accept the connection with role switch disabled.

Test that Host will receive a Connection Complete event from the Lower Tester only when a connection request matches one of the filters set by the Host.

- Reference

[1] 7.3.3

- Initial Condition

- The IUT must be configured as Peripheral.
- The IUT is in STANDBY mode.
- Class of Device of the Lower Tester is set in HCI Set Event Filter.
- Class of Device Mask is set to 0xFFFFFFFF in HCI Set Event Filter.
- Auto Accept Flag is set to Do Auto accept the connection.

- Test Procedure

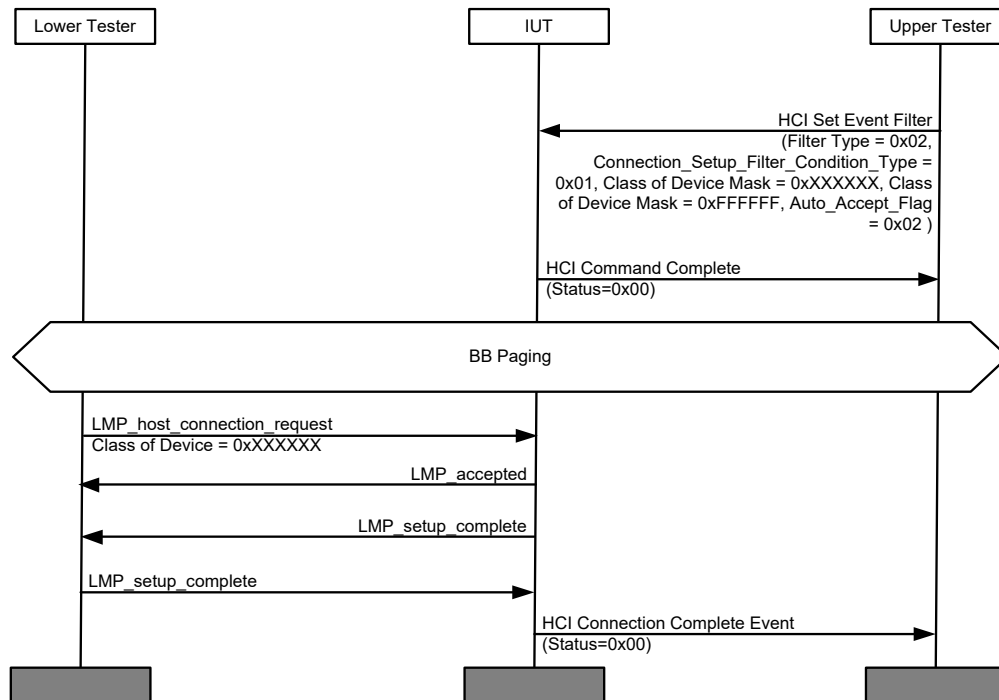


Figure 4.65: HCI/HFC/BV-07-C [Set_Event_Filter Command, Host configures the Controller to Allow Connections, specifying a Class of Device and a Class of Device Mask] MSC

- Expected Outcome

Pass verdict

The IUT returns 'Command Complete' (Status = 0x00) (Success) to the *Set_Event_Filter* command.

The IUT will accept the connection request when the condition is met and the auto accept flag was set for that condition. The IUT will send the 'Connection Complete' (Status=0x00) (Success) event to the Host.

HCI/HFC/BV-08-C [Set_Event_Filter Command to controls which events are generated using filters]

- Test Purpose

Verify that the *Set_Event_Filter* command controls which events are generated using filters.

In this test, the Host configure the Controller to Allow Connections from a device with a specific BD_ADDR, specifying the BD_ADDR of the Lower Tester. For this connection setup filter condition, the Auto_Accept_Flag is set to Do NOT auto accept the connection.

Test that the Host will receive a Connection Request event from the Lower Tester and will not auto accept the connection, and the Upper Tester verifies the behavior of the IUT for a successful connection and also an unsuccessful connection scenario.

- Reference

[1] 7.3.3

- Initial Condition
 - The IUT must be configured as Peripheral.
 - The IUT is in STANDBY mode.
 - BD address of the Lower Tester is set in HCI Set Event Filter.
 - Auto Accept Flag is set to Do NOT Auto accept the connection.
 - Connection Setup Filter Condition is set to Allow Connections from a device with a specific BD_ADDR.
- Test Procedure

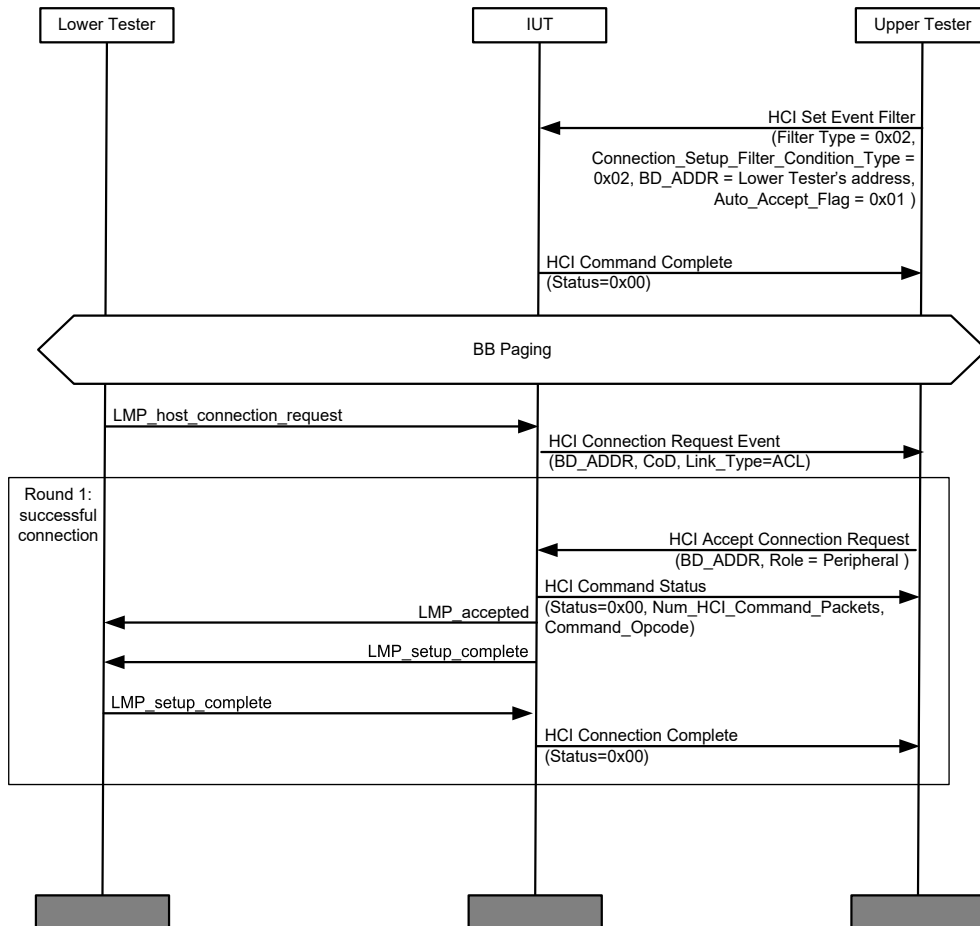


Figure 4.66: HCI/HFC/BV-08-C [Set_Event_Filter Command to controls which events are generated using filters]
MSC – Page 1 of 2

MSC page 1 of 2: Host receives a connection request from the Lower Tester and connection is successful.

Reset the device before the next round.

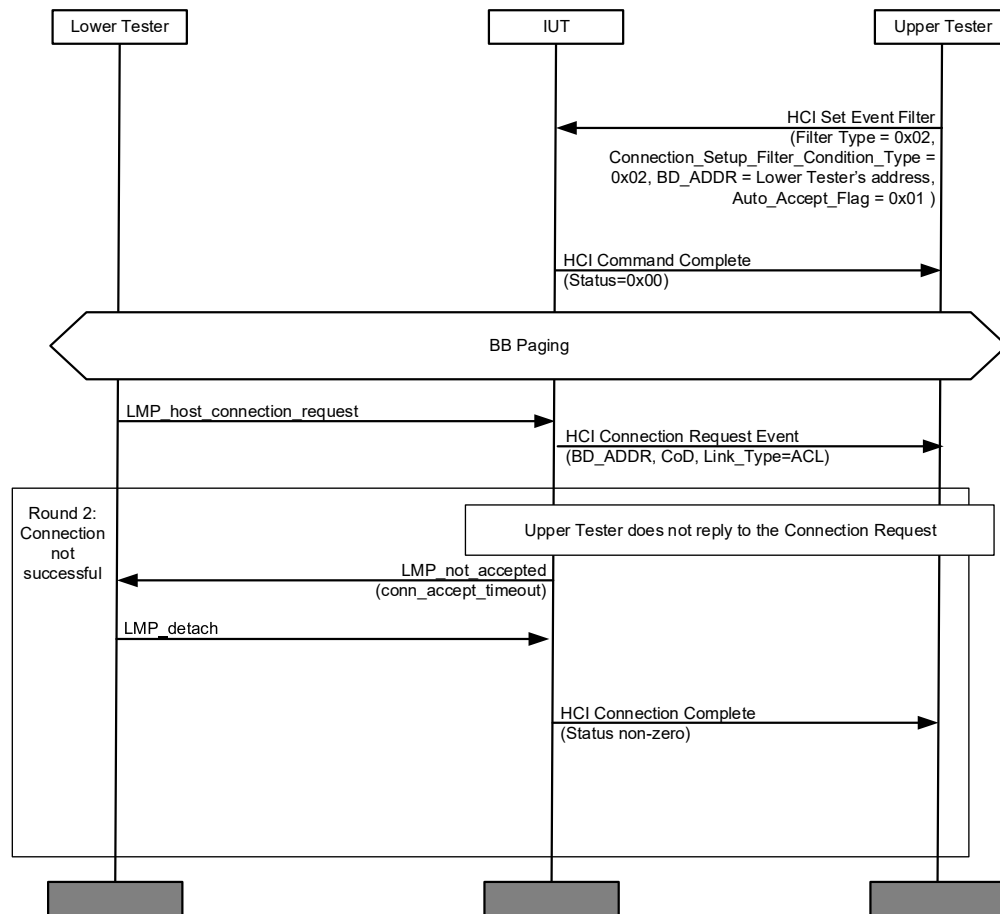


Figure 4.67: HCI/HFC/BV-08-C [Set_Event_Filter Command to controls which events are generated using filters]
MSC – Page 2 of 2

MSC page 2 of 2: The Host receives a connection request from the Lower Tester, and the Upper Tester does not reply.

- Expected Outcome

Pass verdict

In the first round:

- The IUT returns 'command complete' success to the *Set_Event_Filter* command from the Upper Tester.
- The IUT sends the 'Connection Request' event to the Upper Tester.
- After the Upper Tester accepts the connection, the connection with the IUT and the Lower Tester is successfully established.

In the second round:

- The IUT returns 'command complete' success to the *Set_Event_Filter* command from the Upper Tester.
- The IUT sends the 'Connection Request' event to the Upper Tester.
- After the Upper Tester does not answer the connection request, the IUT sends an LMP_NOT_ACCEPTED PDU with non-zero status to the Lower Tester.

4.8.5 Set_Event_Filter Command to perform auto accept synchronous connection from configured and specified bd address

- Test Purpose

Verify that the *Set_Event_Filter* command can perform auto accept connection from a configured and specified BD address over an SCO Type connection as specified in [Table 4.29](#).

- Reference

[1] 7.3.3

- Initial Condition

- The IUT configured as Peripheral.
- See Section [4.1.3](#).
- BD address of the Lower Tester is set in HCI Set Event Filter.

- Test Procedure

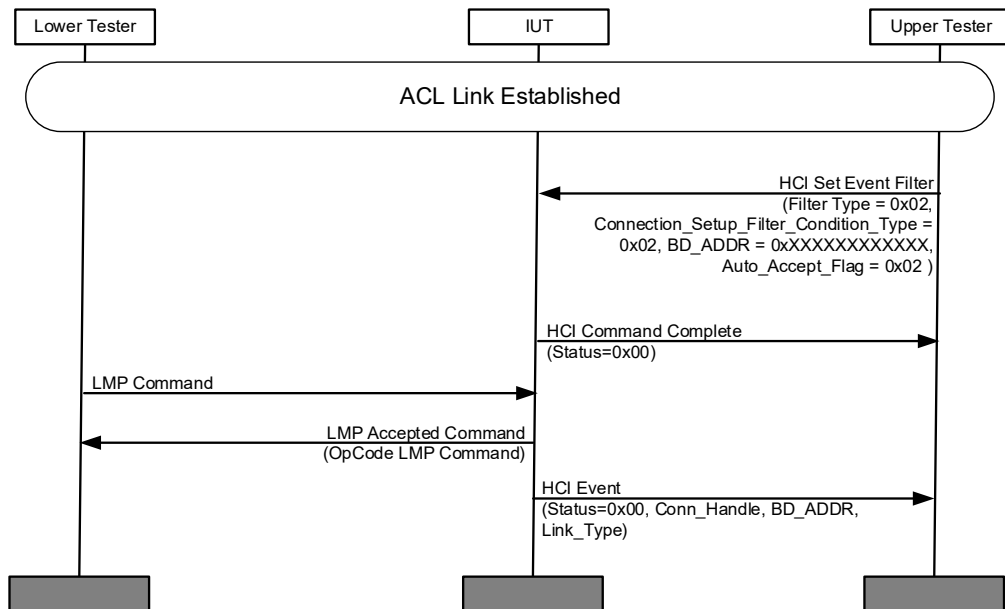


Figure 4.68: *Set_Event_Filter* Command to perform auto accept synchronous connection from configured and specified bd address MSC

- Test Case Configuration

Test Case	SCO Type	LMP Command	LMP Accepted Command	HCI Event
HCI/HFC/BV-09-C	SCO	LMP_SCO_LINK_REQ	LMP_ACCEPTED	HCI Connection Complete Event

Test Case	SCO Type	LMP Command	LMP Accepted Command	HCI Event
HCI/HFC/BV-10-C	eSCO	LMP_eSCO_LINK_REQ	LMP_ACCEPTED_EXT	HCI Synchronous Connection Complete Event

Table 4.29: *Set_Event_Filter* Command to perform auto accept synchronous connection from configured and specified bd address test cases

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Filter* command.

The IUT does not return a 'Connection Request' event.

The IUT does return a '(Synchronous) Connection Complete' event.

[HCI/HFC/BV-11-C \[Auto Accept Off, Event Masked, connection request rejection over ACL\]](#)

- Test Purpose

Verify that the *Set_Event_Filter* command leads to connection request rejection from peer device when the HCI_Connection_Request event is masked.

- Reference

[\[1\]](#) 7.3.3

- Initial Condition

- The IUT configured as Peripheral.
- The IUT is in STANDBY mode.
- The IUT has masked out the Connection Request Event (3) bit.

- Test Procedure

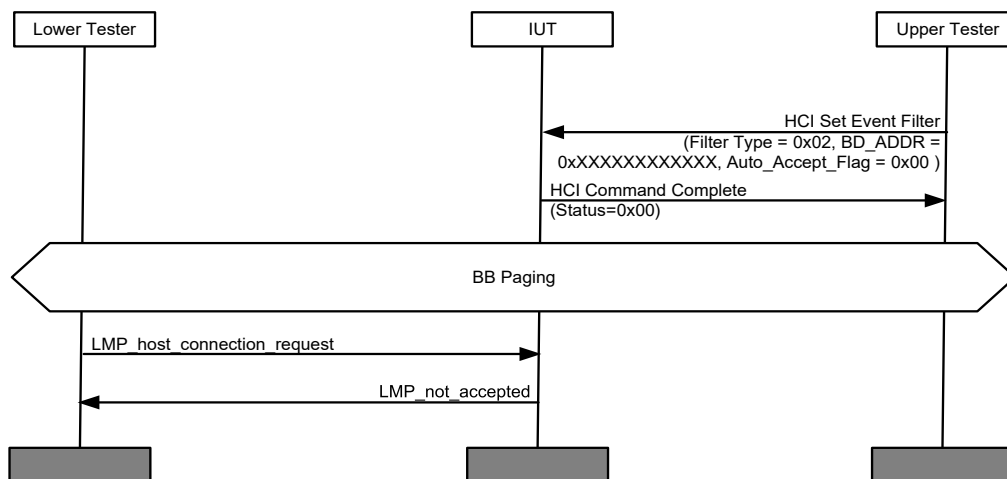


Figure 4.69: *HCI/HFC/BV-11-C [Auto Accept Off, Event Masked, connection request rejection over ACL]* MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Filter* command.

The IUT does not return a 'Connection Request' event.

The IUT rejects the connection to the LT.

4.8.6 Auto Accept Off, Event Masked, connection request rejection over SCO Type

- Test Purpose

Verify that the *Set_Event_Filter* command leads to connection request rejection from peer device when the HCI_Connection_Request event is masked for a SCO Type connection as specified in [Table 4.30](#).

- Reference

[1] 7.3.3

- Initial Condition

- The IUT configured as Peripheral.
- See Section [4.1.3](#).
- The IUT has masked out the Connection Request Event (3) bit.

- Test Procedure

1. The Upper Tester calls HCI_Set_Event_Filter with Auto_Accept_Flag=0x0 , and address of the Lower Tester, and valid values for all other parameters.
2. The Lower Tester initiates a connection to the IUT.
3. The IUT will reject the connection.

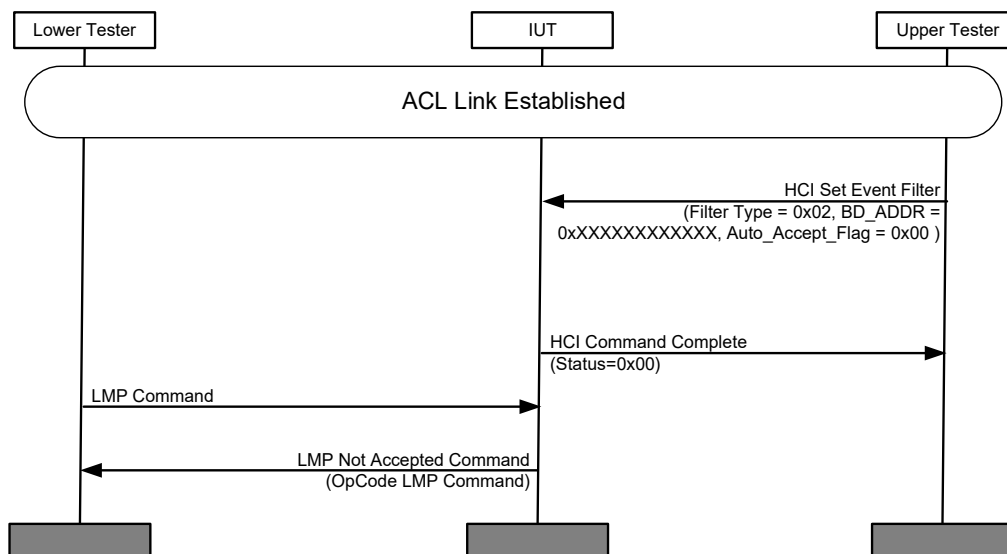


Figure 4.70: Auto Accept Off, Event Masked, connection request rejection over SCO Type MSC

- Test Case Configuration

Test Case	SCO Type	LMP Command	LMP Not Accepted Command
HCI/HFC/BV-12-C	SCO	LMP_SCO_LINK_REQ	LMP_NOT_ACCEPTED
HCI/HFC/BV-13-C	eSCO	LMP_eSCO_LINK_REQ	LMP_NOT_ACCEPTED_EXT

Table 4.30: Auto Accept Off, Event Masked, connection request rejection over SCO Type test cases

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the *Set_Event_Filter* command.

The IUT does not return a 'Connection Request' event.

The IUT rejects the connection to the Lower Tester.

4.9 Authentication and Encryption

Verify the correct implementation of the Host flow control commands.

[HCI/AEN/BV-01-C \[Link Key Commands\]](#)

- Test Purpose

Verify that the Write Stored Link Key, Read Stored Link Key, and Delete Stored Link Key commands write, read, and delete stored link keys.

- Reference

[\[1\]](#) 7.3.8, 7.3.9, 7.3.10

- Initial Condition

- No LL connection exists.

- Test Procedure

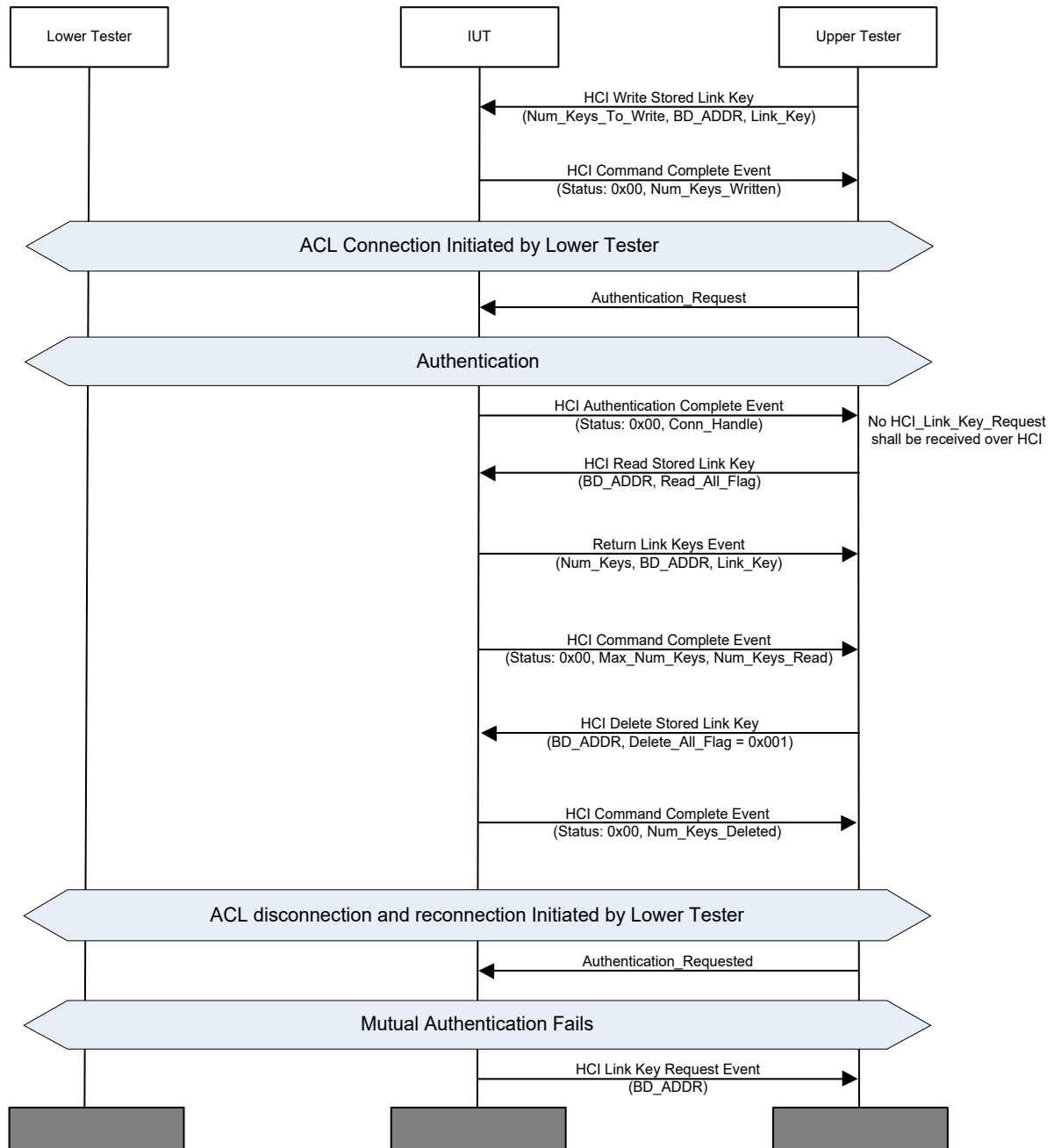


Figure 4.71: HCI/AEN/BV-01-C [Link Key Commands] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Write Stored Link Key command. The IUT returns 'command complete' succeeded to the Read Stored Link Key command and returns the expected stored link key.

The authentication using the stored link key succeeds as indicated by an 'Authentication Complete' event.

The IUT returns 'command complete' succeeded to the Delete Stored Link Key command.

The final authentication request results in a returned 'Link key Request' event.

- Note

This test case is applicable only to an IUT that support the Bluetooth Core Specification Version 2.0 or earlier.

HCI/AEN/BV-02-C [Reading All Link Keys]

- Test Purpose

Verify that the IUT can have its link keys read, without revealing the values of the link keys stored in the controller.

- Reference

[1] 7.3.8

- Initial Condition

- The IUT is connected via HCI and has a minimum of one stored link key.

- Test Procedure

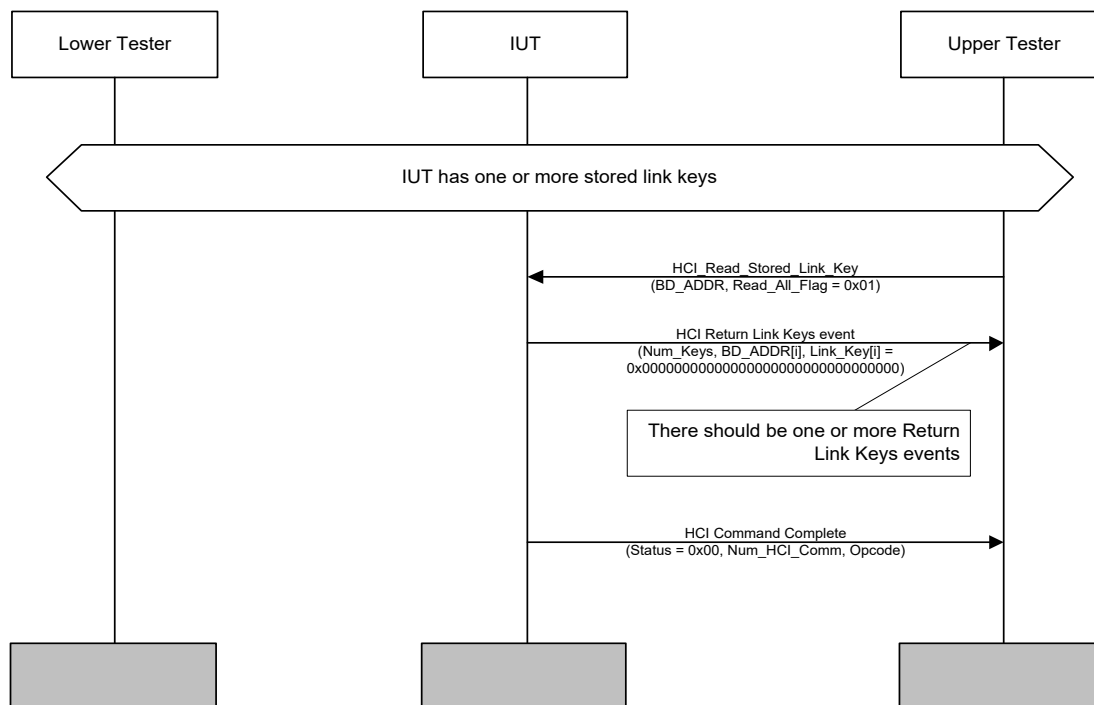


Figure 4.72: HCI/AEN/BV-02-C [Reading All Link Keys] MSC

The Upper Tester issues a Read Stored Link Keys with Read_All_Flag.

The IUT returns a Return Link Keys event.

- Expected Outcome

Pass verdict

The link key values in the Return Link Keys event are zero.

HCI/AEN/BV-03-C [Reading Single Link Key]

- Test Purpose

Verify that the IUT can have a link key read, without revealing the value of the link keys stored in the controller.

- Reference

[1] 7.3.8

- Initial Condition

- The IUT is connected via HCI and has a minimum of one stored link key.

- Test Procedure

The Upper Tester issues a Read Stored Link Keys for a single *BD_ADDR*.

The IUT returns a Return Link Keys event.

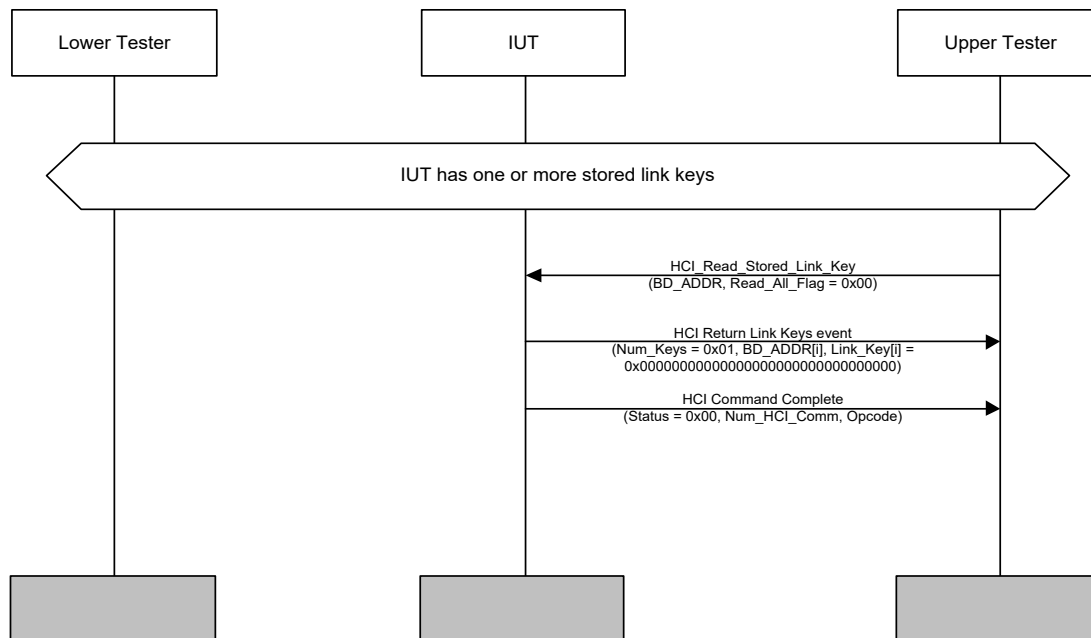


Figure 4.73: HCI/AEN/BV-03-C [Reading Single Link Key] MSC

- Expected Outcome

Pass verdict

The link key values in the Return Link Keys event are zero.

HCI/AEN/BV-04-C [Link Key Commands – IUT Returns All Zero Link Key]

- Test Purpose

Verify that the Write Stored Link Key, Read Stored Link Key, and Delete Stored Link Key commands write, read, and delete stored link keys and the Return Link Keys Event does not return the value of the link keys.

- Reference

[1] 7.3.8, 7.3.9, 7.3.10

- Initial Condition
 - No LL connection exists.
- Test Procedure

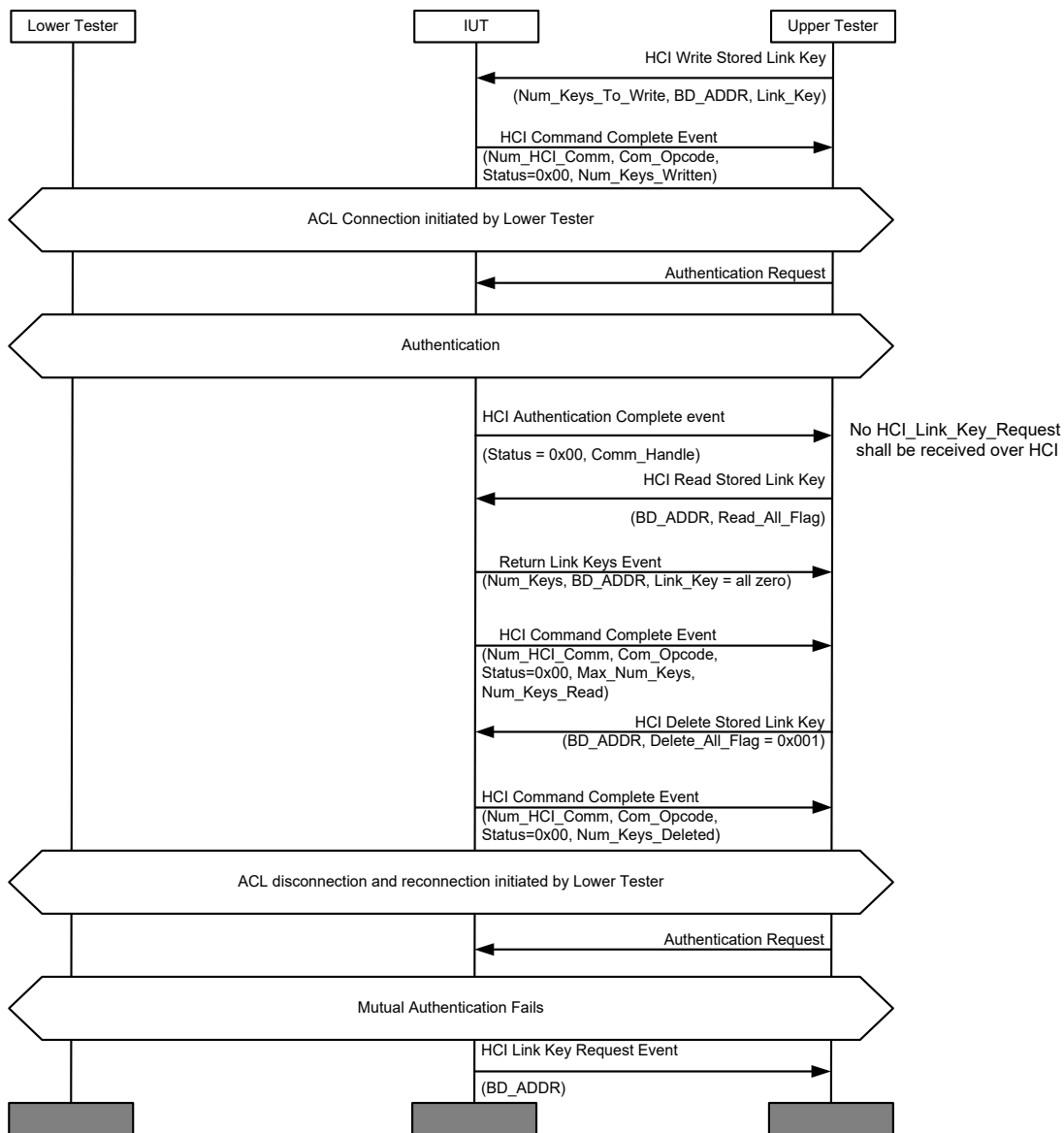


Figure 4.74: HCI/AEN/BV-04-C [Link Key Commands – IUT Returns All Zero Link Key] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Write Stored Link Key command. The IUT returns 'command complete' succeeded to the Read Stored Link Key command and returns the all zero link key.

The authentication using the stored link key succeeds as indicated by an 'Authentication Complete' event.

The IUT returns 'command complete' succeeded to the Delete Stored Link Key command.

The final authentication request results in a returned 'Link key Request' event.

HCI/AEN/BV-05-C [Read Local OOB Extended Data Command, test unique values]

- Test Purpose

Verify that the IUT uses distinctive random numbers to generate the P-192 and P-256 public-private key pairs.

- Reference

[1] 7.3.95

- Initial Condition

- The IUT has been HCI reset and has been SSP enabled and Secure Connections enabled (if supported) by the Host via the Write Simple Pairing Mode and the Write Secure Connections Host Support Commands.

- Test Procedure

The Upper Tester issues a Read Local OOB Extended Data Command.

The IUT returns a Command Complete Event with four values C_192, R_192, C_256, and R_256.

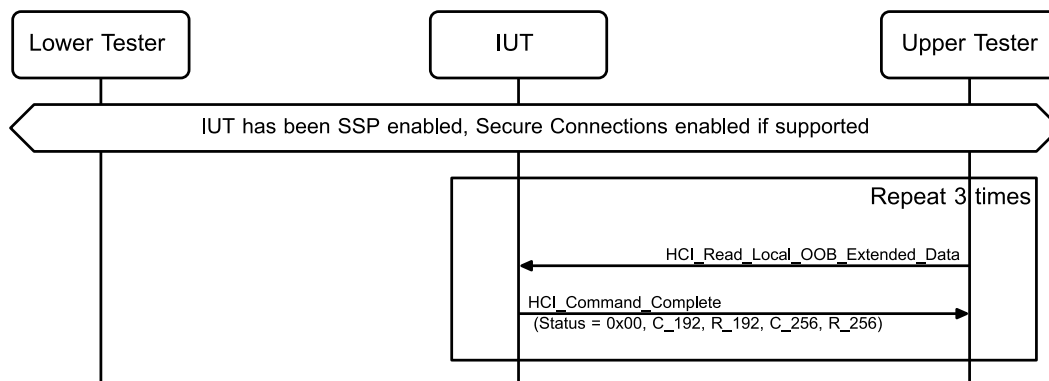


Figure 4.75: HCI/AEN/BV-05-C [Read Local OOB Extended Data Command, test unique values] MSC

- Expected Outcome

Pass verdict

For each Read Local OOB Extended Data Command, the values of R_192 and R_256 are different than the preceding set of values. For example, the values returned from the second read command should not be an identical match to the values from the first read command. Similarly, the values from the third read command should not be an identical match to the values from either the first or the second read command. Also, for each read command, the values of R_192 and R_256 should not match each other.

HCI/AEN/BV-06-C [Public Keys]

- Test Purpose

Verify that the IUT can generate a P-256 Public-Private key pair and return the P-256 Public Key.

- Reference

[8] 7.7.65.8, 7.8.36

- Initial Condition
 - The IUT is in standby.
- Test Procedure

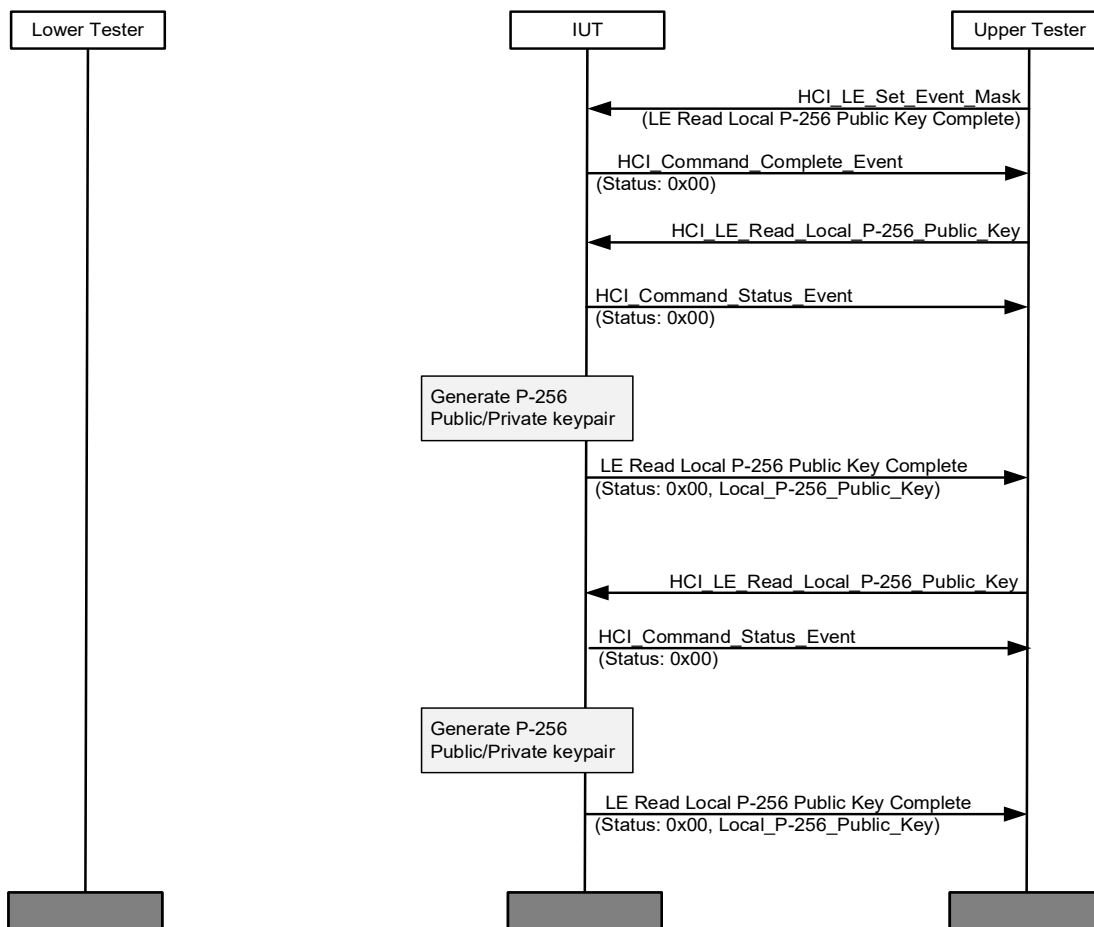


Figure 4.76: HCI/AEN/BV-06-C [Public Keys] MSC

- Expected Outcome

Pass verdict

The IUT returns the local P-256 Public Key through the LE Read Local P-256 Public Key Complete event.

When the command is repeated, the IUT generates a new P-256 Public-Private key pair and returns the corresponding Public Key.

- Note

The parameter "Local_P-256_Public_Key" sent from the IUT to the Upper Tester is Key_X_Coordinate and Key_Y_Coordinate, where each of the two are 32 octets.

HCI/AEN/BV-07-C [Generate DH Keys]

- Test Purpose
Verify that the IUT can generate a new P-256 DHKey.
- Reference
[\[8\]](#) 7.7.65.9, 7.8.37
- Initial Condition
 - The IUT is in standby.
- Test Procedure

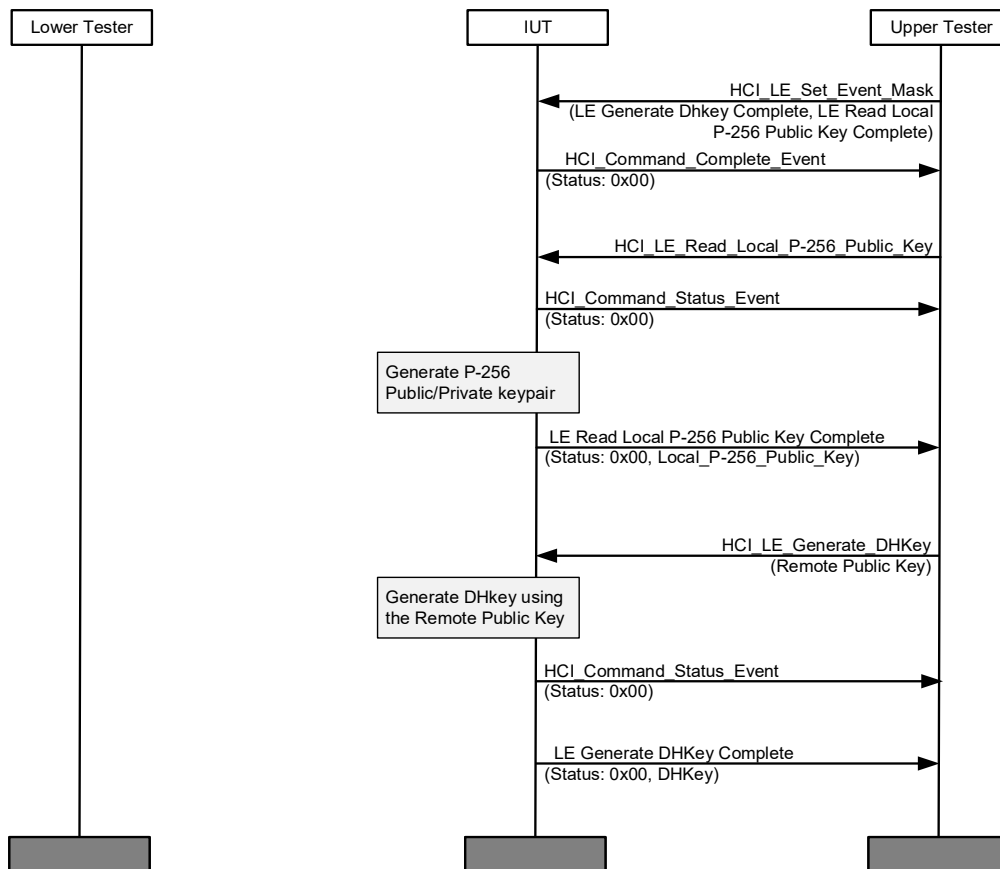


Figure 4.77: HCI/AEN/BV-07-C [Generate DH Keys] MSC

- Expected Outcome
Pass verdict
The IUT returns the DHkey through the LE Generate DHKey Complete event. The generated DHkey is verified by the Upper Tester.
- Notes
The Command is applicable only to an IUT that supports the LE Secure Connections feature.
The parameter "Local_P-256_Public_Key" sent from the IUT to the Upper Tester is Key_X_Coordinate and Key_Y_Coordinate, where each of the two are 32 octets.

HCI/AEN/BV-08-C [Generate Debug Keys]

- **Test Purpose**
Verify that the IUT can generate a debug key.
- **Reference**
[\[11\]](#) 7.7.65.9, 7.8.93
- **Initial Condition**
 - The IUT is in standby.
- **Test Procedure**

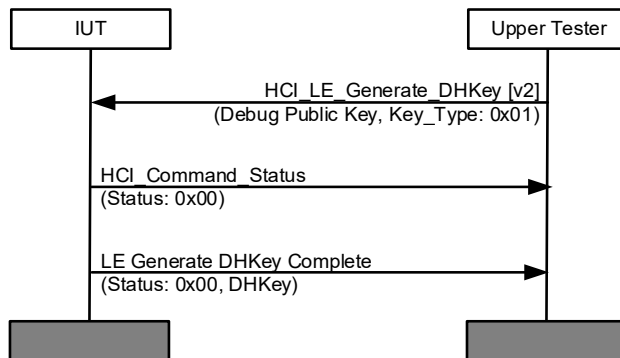


Figure 4.78: HCI/AEN/BV-08-C [Generate Debug Keys] MSC

- **Expected Outcome**
Pass verdict
The IUT returns the debug key through the LE Generate DHKey Complete event. The Upper Tester verifies the generated debug key.

HCI/AEN/BV-09-C [Read Local OOB Extended Data command, Host bits not set]

- **Test Purpose**
Verify that the IUT rejects the Read Local OOB Extended Data command when both the Secure Connections (Host Support) and Secure Simple Pairing (Host Support) bits are not set.
- **Reference**
[\[1\]](#) 7.1.53
- **Initial Condition**
 - No LL connection exists.
 - The IUT has Secure Connections Host Support disabled.
- **Test Procedure**
 1. The Upper Tester sends an HCI_Read_Secure_Connections_Host_Support command to the IUT.
 2. The IUT sends a successful HCI_Command_Complete event to the Upper Tester with the Secure_Connections_Host_Support parameter. If Secure_Connections_Host_Support is set to 0x01, then the test ends with a Fail verdict.

3. The Upper Tester sends an HCI_Write_Secure_Connections_Host_Support command to the IUT with Secure_Connections_Host_Support set to 0x00 and receives a successful HCI_Command_Complete event in response.
4. The Upper Tester sends an HCI_Read_Local_OOB_Extended_Data command to the IUT.
5. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.
6. The Upper Tester sends an HCI_Write_Secure_Connections_Host_Support command to the IUT with Secure_Connections_Host_Support set to 0x01 and receives a successful HCI_Command_Complete event in response.
7. The Upper Tester sends an HCI_Read_Local_OOB_Extended_Data command to the IUT.
8. The IUT sends a successful HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
9. The Upper Tester sends an HCI_Write_Secure_Connections_Host_Support command to the IUT with Secure_Connections_Host_Support set to 0x00 and receives a successful HCI_Command_Complete event in response.
10. The Upper Tester sends an HCI_Write_Simple_Pairing_Mode command to the IUT with Simple_Pairing_Mode set to 0x01 and receives a successful HCI_Command_Complete event in response.
11. The Upper Tester sends an HCI_Read_Local_OOB_Extended_Data command.
12. The IUT sends a successful HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

- Expected Outcome

Pass verdict

In Step 5, the IUT returns a 0x0C error code.

In Steps 8 and 12, the IUT sends a successful HCI_Command_Complete event.

Fail verdict

In Step 2, the IUT supports Secure Connections Host Support.

4.9.1 Generate DH Key Error With Invalid Point

- Test Purpose

Verify that the IUT can return an error when invalid public keys are received.

- Reference

[8], [10] 7.7.65.9, 7.8.37

- Initial Condition

- The IUT is in standby.

- Test Case Configuration

Test Case	DH_Key Parameter
HCI/AEN/BI-01-C [Generate DH Key Error With Invalid Point, v5.4]	Any value
HCI/AEN/BI-02-C [Generate DH Key Error With Invalid Point, v6.0]	All octets set to 0xFF

Table 4.31: Generate DH Key Error With Invalid Point test cases

- Test Procedure

Run the test once for each of the rounds and generate invalid public keys as specified in [Table 4.32](#) (HCI_LE_Generate_DHKey PDU):

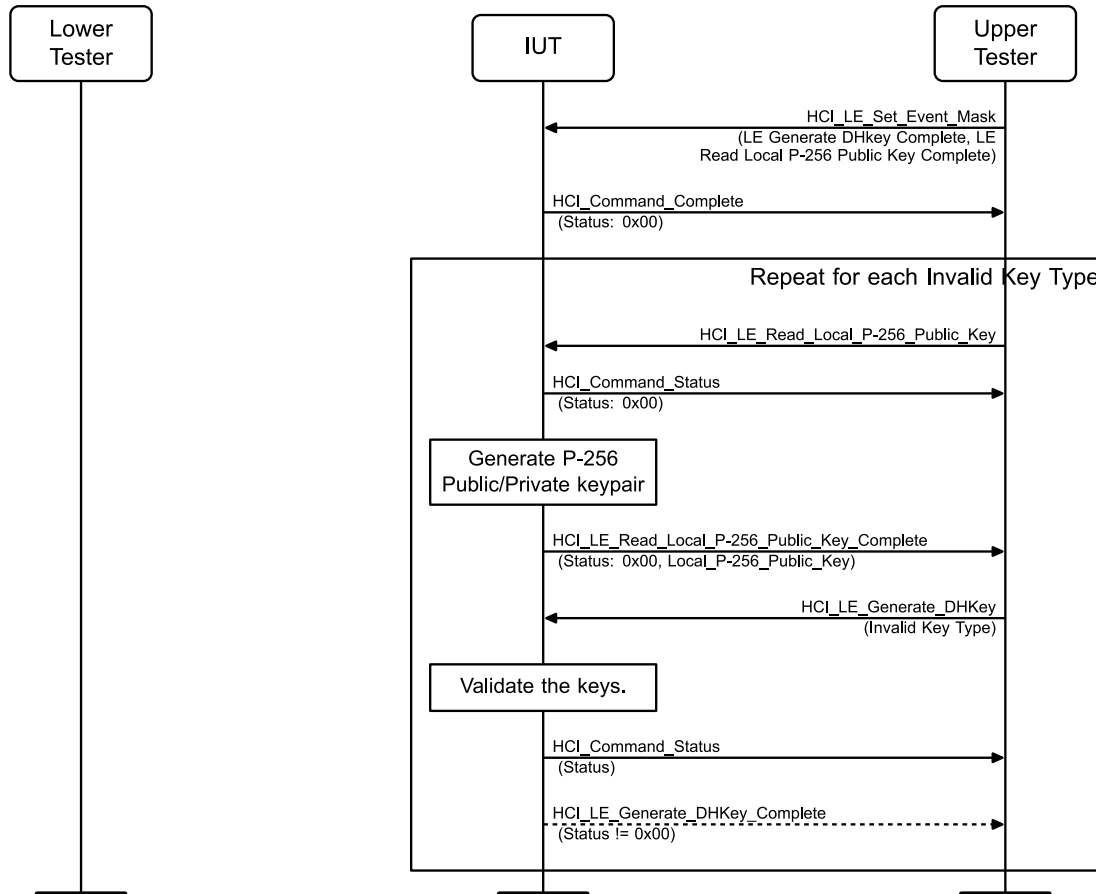


Figure 4.79: Generate DH Key Error With Invalid Point MSC

1. The Upper Tester sends an HCI_LE_Set_Event_Mask command to the IUT and receives a successful HCI_Command_Complete event in response.

Repeat Steps 2–6 for each round in [Table 4.32](#).

2. The Upper Tester sends an HCI_LE_Read_Local_P-256_Public_Key command to the IUT and receives a successful HCI_Command_Status event in response.
3. The IUT sends an HCI_LE_Read_Local_P-256_Public_Key_Complete event to the Upper Tester with Status set to 0x00 and the generated Local_P-256_Public_Key.
4. The Upper Tester sends an HCI_LE_Generate_DHKey command to the IUT with the Invalid Key Type as specified in [Table 4.32](#).
5. The IUT sends an HCI_Command_Status event to the Upper Tester.
6. If the Status is set to 0x00 in Step 5, the IUT sends an HCI_LE_Generate_DHKey_Complete event with Status > 0x00.

Round	Key Size	Invalid Key Type
1	P-256	Generate valid public key and set y-coordinate = 0
2	P-256	Generate valid public key and flip a bit in y-coordinate
3	P-256	Public Key coordinates (0, 0)

Table 4.32: Generate DH Key Error With Invalid Point rounds

- Expected Outcome

Pass verdict

The IUT returns an HCI_Command_Status event with Status != 0 in response to the HCI_LE_Generate_DHKey.

or

The IUT returns an HCI_Command_Status event with Status = 0 followed by a LE Generate DHKey Complete event with Status != 0 in response to the HCI_LE_Generate_DHKey command.

In Step 6, all octets of the DH_Key parameter are set as specified in [Table 4.31](#).

- Note

The parameter “Local_P-256_Public_Key” sent from the IUT to the Upper Tester is Key_X_Coordinate and Key_Y_Coordinate, where each of the two are 32 octets.

4.10 Controller Configuration

Verify the controller configuration.

HCI/CCO/BV-01-C [Write Location Data Command/Read Location Data Command]

- Test Purpose

Verify that the Write Location Data Command/ Read Location Data Command are handled correctly by the IUT.

- Reference

[1] 7.3.70, 7.3.71

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues Write Location Data Command with preset information to the IUT.

The Upper Tester receives success status in the Write Location Data command complete event.

The Upper Tester issues Read Location Data Command with preset information to the IUT.

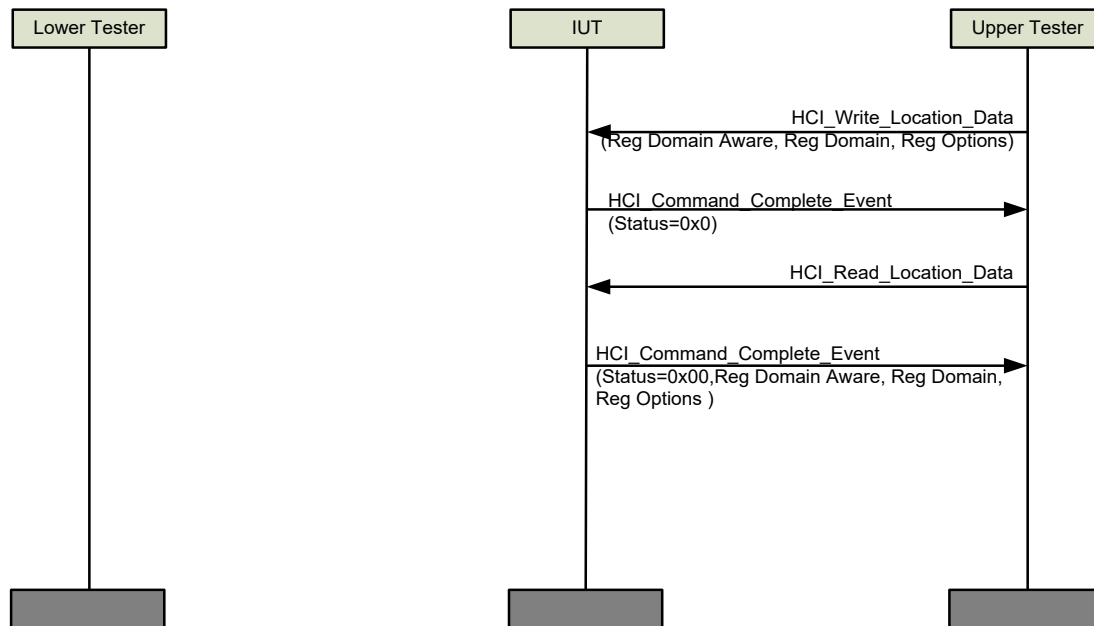


Figure 4.80: HCI/CCO/BV-01-C [Write Location Data Command/ Read Location Data Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives command complete event with success status for two commands. The Upper Tester receives the data returned by the Read Location Data command complete event. The received data matches what was used in the Write Location Data Command.

HCI/CCO/BV-03-C [Write LE Host Support Command]

- Test Purpose

Verify that the HCI_Write_LE_Host_Support command writes the *LE_Support_Host* configuration parameter of the IUT.

- Reference

[1] 7.3.79

- Initial Condition

- The IUT is in standby.

- Test Procedure

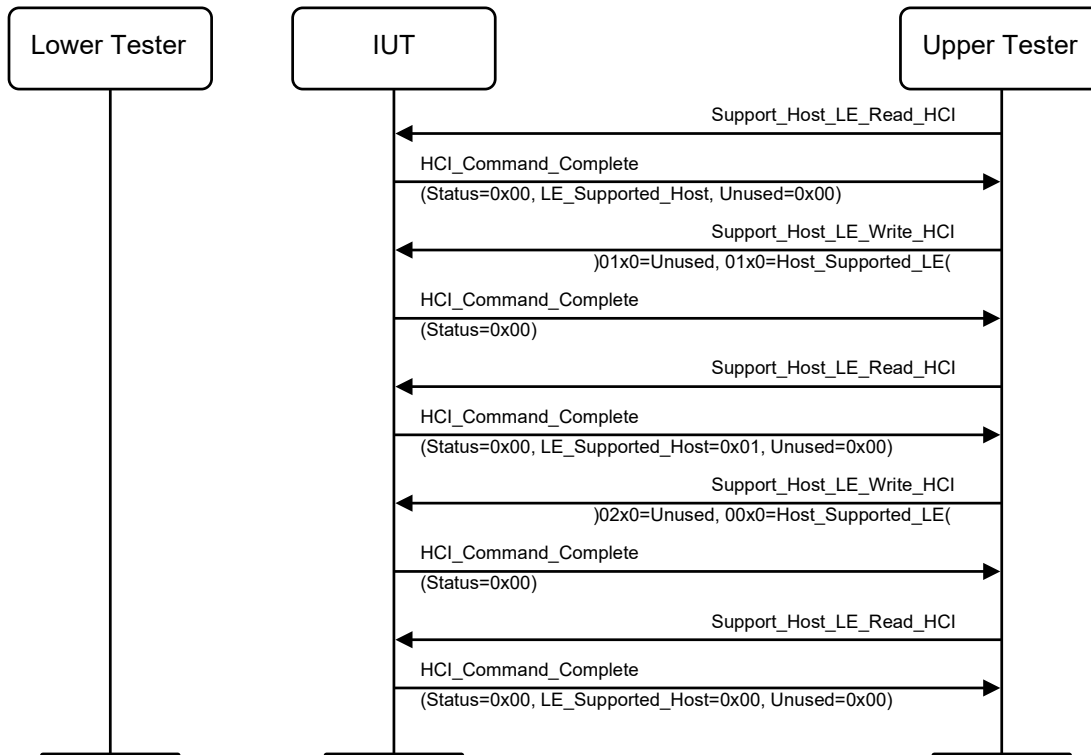


Figure 4.81: HCI/CCO/BV-03-C [Write LE Host Support Command] MSC

- Expected Outcome

Pass verdict

The IUT returns command complete to the first HCI_Read_LE_Host_Support command and returns the LE_Supported_Host parameter set to 0x00.

In response to each HCI_Read_LE_Host_Support command, the Unused parameter is set to 0x00.

The IUT returns 'command complete' succeeded to the first and second HCI_Write_LE_Host_Support commands.

The IUT returns 'command complete' with LE_Supported_Host set to 0x01 in response to the second Read_LE_Host_Support command.

The IUT returns 'command complete' with LE_Supported_Host set to 0x00 in response to the third Read_LE_Host_Support command.

- Notes

In versions up to 5.2, the Unused parameter was called Simultaneous_LE_Host.

HCI/CCO/BV-05-C [LE Not Supported]

- Test Purpose

Verify that an IUT that does not support LE does not recognize LE HCI commands.

- Reference

[1] 6.33

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester sends an HCI LE Set Event Mask Command and expects the IUT to return an HCI_Command_Complete event or HCI_Command_Status event with Status = Unknown HCI Command.

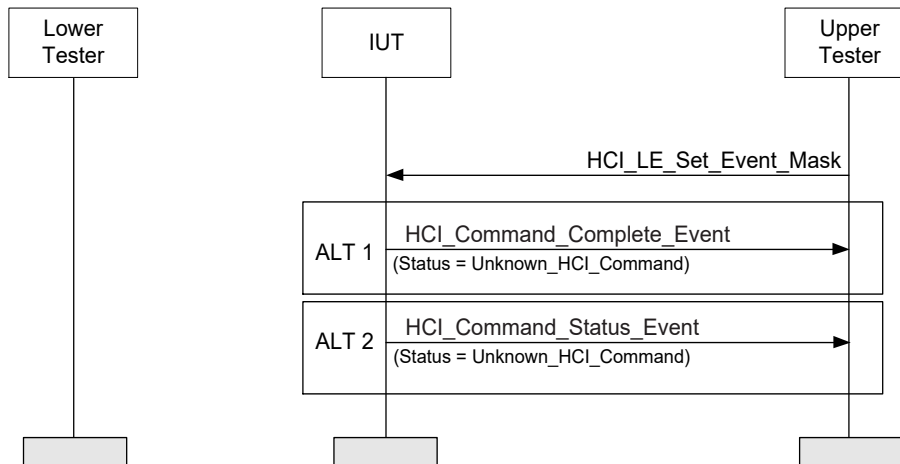


Figure 4.82: HCI/CCO/BV-05-C [LE Not Supported] MSC

- Expected Outcome

Pass verdict

The IUT returns an HCI Command Complete or HCI_Command_Status event with Status = Unknown HCI Command.

HCI/CCO/BV-07-C [BR/EDR Not Supported]

- Test Purpose

Verify that an IUT that supports LE only does not respond to BR/EDR HCI commands.

- Reference

[1] 3.2

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester sends an HCI Inquiry Command and expects the IUT to return an HCI_Command_Complete event or HCI_Command_Status event with Status = Unknown HCI Command.

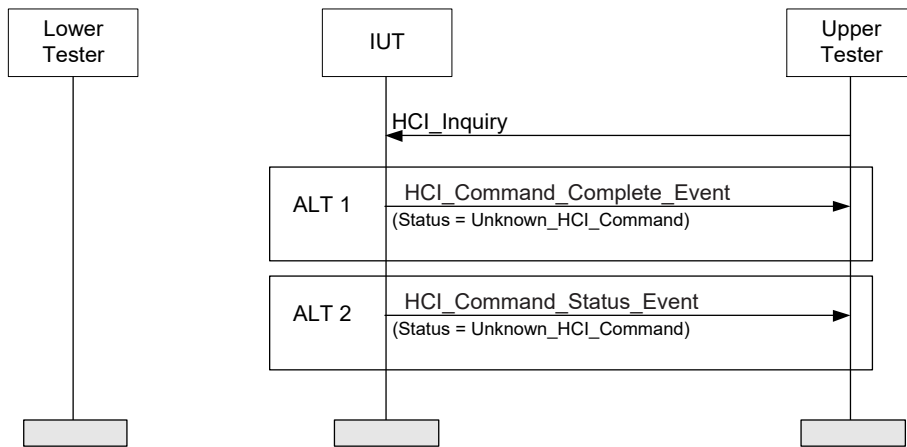


Figure 4.83: HCI/CCO/BV-07-C [BR/EDR Not Supported] MSC

- Expected Outcome

Pass verdict

The IUT returns an HCI Command Complete or HCI_Command_Status event with Status = Unknown HCI Command.

HCI/CCO/BV-08-C [Read Extended Page Timeout]

- Test Purpose

Verify that the IUT correctly handles Read Extended Page Timeout.

- Reference

[1] 7.3

- Initial Condition

- The IUT is in standby.

- Test Procedure

- The Upper Tester issues HCI_Write_Extended_Page_Timeout Command with preset information to the IUT.
- The Upper Tester receives success status in the HCI_Write_Extended_Page_Timeout Command complete event.
- The Upper Tester issues HCI_Read_Extended_Page_Timeout Command to the IUT.

- Expected Outcome

Pass verdict

The Upper Tester receives command complete event with success status for the commands sent in a and c.

The Upper Tester receives the data returned by the HCI_Read_Extended_Page_Timeout Command complete event. The received data matches the data that was used in the HCI_Write_Extended_Page_Timeout Command.

HCI/CCO/BV-09-C [LE Set Data Length]

- Test Purpose

Verify that the IUT correctly handles the LE Set Data Length Command

- Reference

[2] 7.8.33

- Initial Condition

- LL connection established, the IUT is Central or Peripheral.

- Test Procedure

The Upper Tester issues an LE Set Data Length command to the IUT containing the current connection handle and with values for TxOctets and TxTime which lie in the permissible range.

The Upper Tester receives a Command Complete event from the IUT for the LE Set Data Length command.

If the command causes the maximum transmission packet size or maximum packet transmission time to change, the Upper Tester receives an LE Data Length Change event from the IUT containing the updated values.

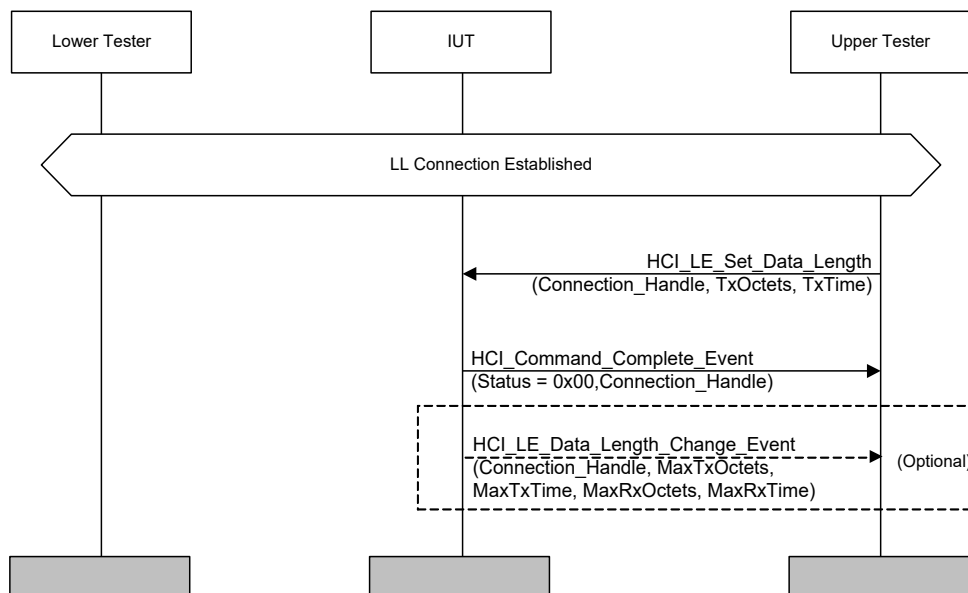


Figure 4.84: HCI/CCO/BV-09-C [LE Set Data Length] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) and with the value for Connection_Handle matching the value sent in the LE Set Data Length Command.

The Upper Tester optionally receives an LE Data Length Change event from the IUT with updated maximum transmission packet size and maximum packet transmission time values.

HCI/CCO/BV-10-C [LE Read Suggested Default Data Length Command]

- **Test Purpose**
Verify that the IUT correctly handles the LE Read Suggested Default Data Length Command
- **Reference**
[\[8\]](#) 7.8.34
- **Initial Condition**
 - The IUT has just been reset and is in standby.
- **Test Procedure**
The Upper Tester issues a LE Read Suggested Default Data Length Command to the IUT.
The Upper Tester receives a Command Complete event from the IUT for the LE Read Suggested Default Data Length Command.

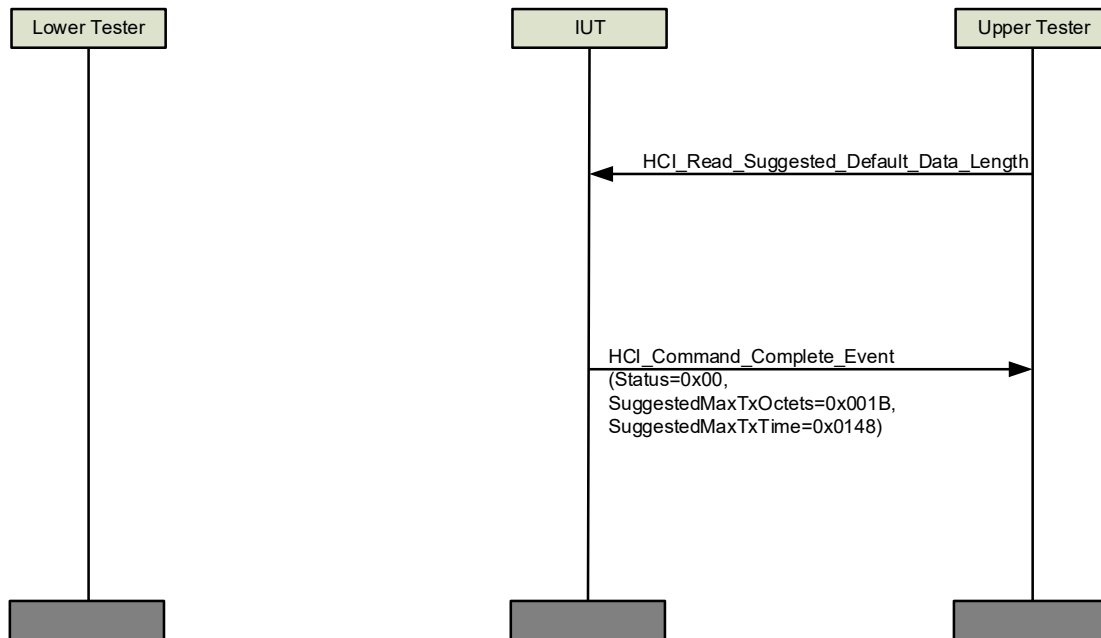


Figure 4.85: HCI/CCO/BV-10-C [LE Read Suggested Default Data Length Command] MSC

- **Expected Outcome**
Pass verdict
The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) and with TxOctets equal to 0x001B and TxTime equal to 0x0148.

HCI/CCO/BV-11-C [LE Write Suggested Default Data Length Command]

- **Test Purpose**
Verify that the IUT correctly handles the LE Write Suggested Default Data Length Command.
- **Reference**
[\[8\]](#) 7.8.35

- Initial Condition
 - The IUT is in standby.
- Test Procedure

For each row in [Table 4.33](#):

The Upper Tester issues a LE Write Suggested Default Data Length Command to the IUT with the values for TxOctets and TxTime given in that row. The Upper Tester receives a Command Complete event from the IUT for the LE Write Suggested Default Data Length Command.

The Upper Tester issues a LE Read Suggested Default Data Length Command to the IUT. The Upper Tester receives a Command Complete event from the IUT for the LE Read Suggested Default Data Length Command.

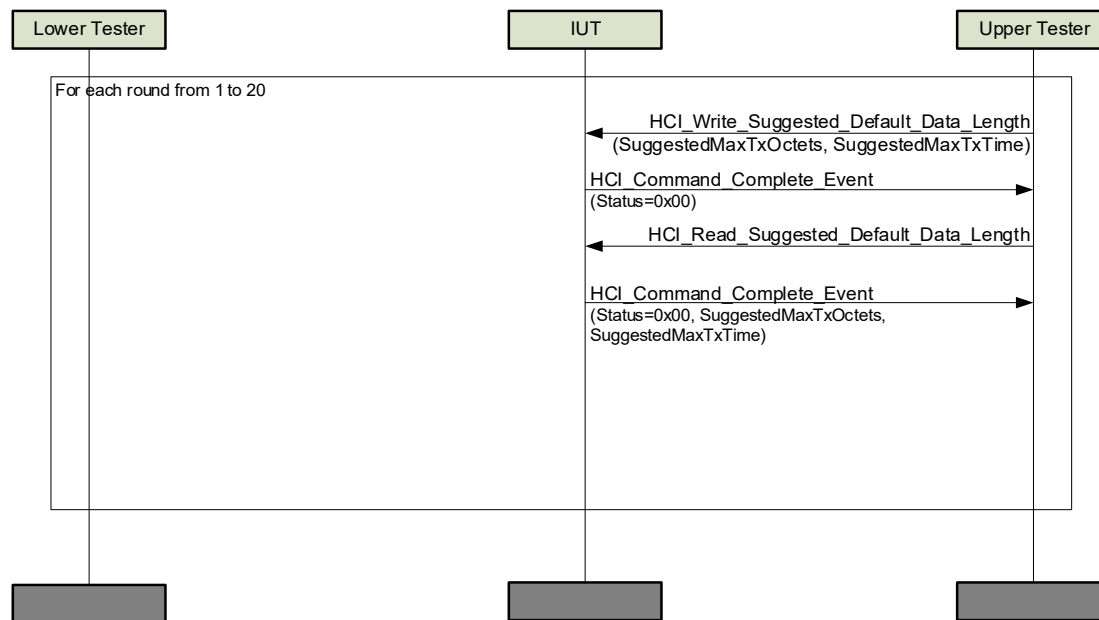


Figure 4.86: HCI/CCO/BV-11-C [LE Write Suggested Default Data Length Command] MSC

Round	TxOctets	TxTime
1	0x001B	0x0148
2	0x001B	0x4290
3	0x001B	0x2000
4	0x00FB	0x0148
5	0x00FB	0x4290
6	0x00FB	0x2000
7	0x0080	0x0148
8	0x0080	0x4290
9	0x0080	0x2000
10–20	A randomly selected value between 0x001B and 0x00FB inclusive.	A randomly selected value between 0x0148 and 0x4290 inclusive.

Table 4.33: HCI/CCO/BV-11-C [LE Write Suggested Default Data Length Command], rounds

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status=0x00 (Success) for the LE Write Suggested Default Data Length Command.

The Upper Tester receives a Command Complete event from the IUT for the LE Read Suggested Default Data Length Command with Status=0x00 (Success).

The values for TxOctets and TxTime in the second Command Complete event equal the values sent in the LE Write Suggested Default Data Length Command.

HCI/CCO/BV-12-C [LE Remove Device From Resolving List Command]

- Test Purpose

Verify that the IUT correctly handles the LE Remove Device From Resolving List Command

- Reference

[8] 7.8.39

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an LE Add Device To Resolving List Command to the IUT with a peer device identity.

The Upper Tester receives a Command Complete event from the IUT for the LE Add Device To Resolving List Command.

The Upper Tester issues an LE Remove Device From Resolving List Command to the IUT with the recently added peer device identity.

The Upper Tester receives a Command Complete event from the IUT for the LE Remove Device From Resolving List Command.

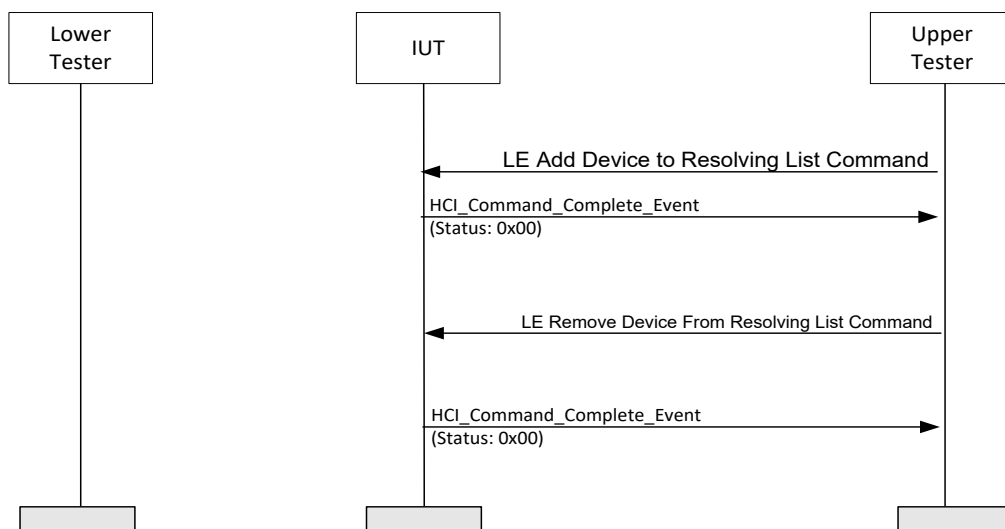


Figure 4.87: HCI/CCO/BV-12-C [LE Remove Device From Resolving List Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) when sending the LE Remove Device From Resolving List Command with a valid device identity.

HCI/CCO/BV-13-C [LE Clear Resolving List Command]

- Test Purpose

Verify that the IUT correctly handles the LE Clear Resolving List Command

- Reference

[8] 7.8.40

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an LE Add Device To Resolving List Command to the IUT with a peer device identity.

The Upper Tester receives a Command Complete event from the IUT for the LE Add Device To Resolving List Command.

The Upper Tester issues an LE Clear Resolving List Command to the IUT with the recently added peer device identity.

The Upper Tester receives a Command Complete event from the IUT for the LE Clear Resolving List Command.

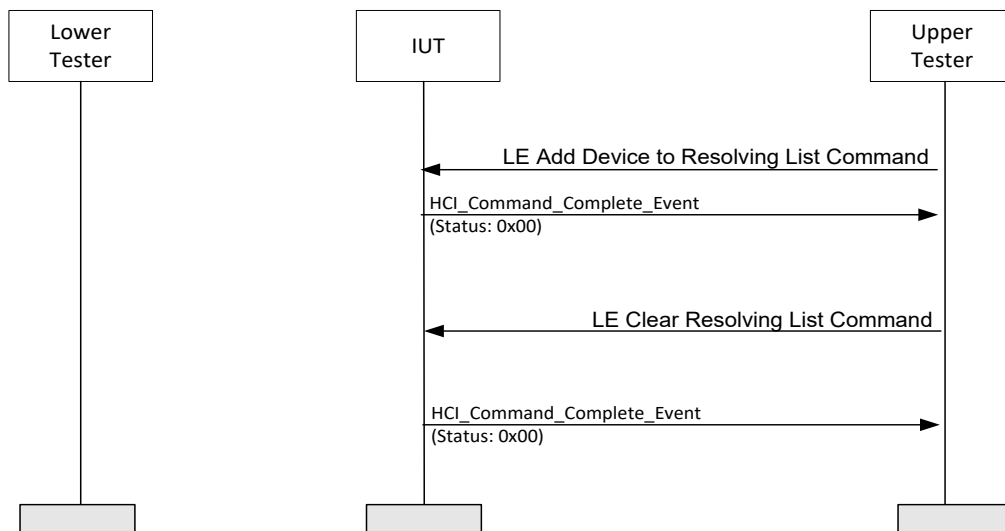


Figure 4.88: HCI/CCO/BV-13-C [LE Clear Resolving List Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) when sending the LE Clear Resolving List Command.

HCI/CCO/BV-14-C [LE Read Resolving List Size Command]

- Test Purpose

Verify that the IUT correctly handles the LE Read Resolving List Size Command

- Reference

[8] 7.8.41

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an LE Read Resolving List Size Command to the IUT.

The Upper Tester receives a Command Complete event from the IUT for the LE Read Resolving List Size Command, with the size of the list.

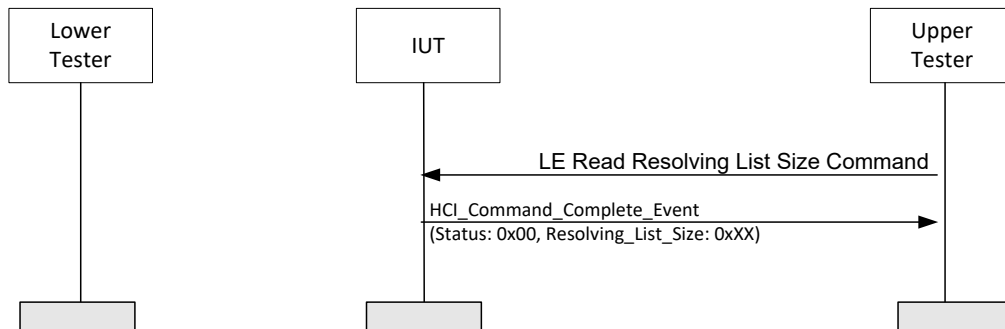


Figure 4.89: HCI/CCO/BV-14-C [LE Read Resolving List Size Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) and Resolving_List_Size = 0xXX when sending the LE Read Resolving List Size Command.

HCI/CCO/BV-15-C [LE Set Default PHY Command]

- Test Purpose

Verify that the IUT correctly handles the LE Set Default PHY Command.

- Reference

[8] 7.8.48

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an LE Set Default PHY command to the IUT with ALL_PHYS set to 0x03 (All PHYs Allowed) and both the TX_PHYS and RX_PHYS fields set to zero (no preferences).

The Upper Tester receives a Command Complete event from the IUT for the LE Set Default PHY command.

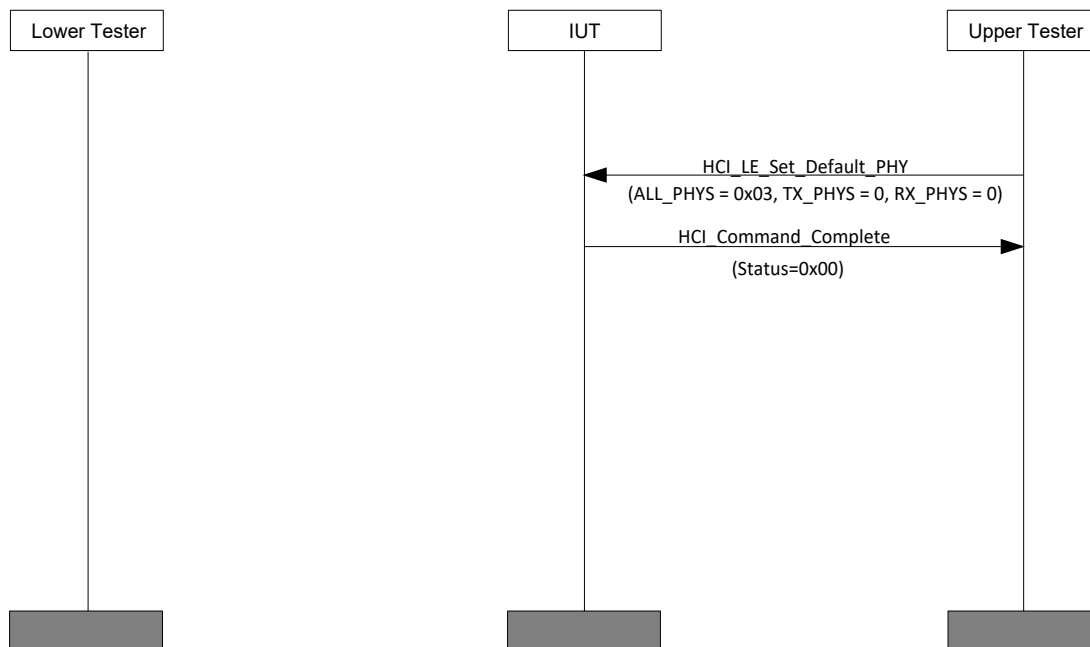


Figure 4.90: HCI/CCO/BV-15-C [LE Set Default PHY Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success).

HCI/CCO/BV-16-C [LE Read Periodic Advertiser List Size Command]

- Test Purpose

Verify that the IUT correctly handles the LE Read Periodic Advertiser List Size Command.

- Reference

[9] 7.8.73

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an LE Read Periodic Advertiser List Size Command.

The Upper Tester receives a Command Complete event from the IUT for the LE Read Periodic Advertiser List Size Command, with the size of the list.

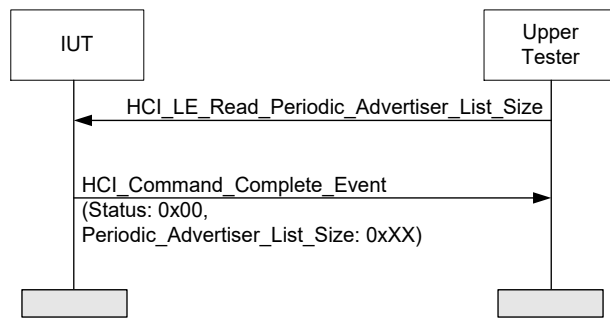


Figure 4.91: HCI/CCO/BV-16-01-C [LE Read Periodic Advertiser List Size Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete Event with Status = 0x00 (Success) and Periodic_Advertiser_List_Size = 0xXX after sending the LE Read Periodic Advertiser List Size command.

HCI/CCO/BV-17-C [LE Add/Remove/Clear Periodic Advertiser List Commands]

- Test Purpose

Verify that the IUT correctly handles the LE Add Device To Periodic Advertiser List, LE Remove Device From Periodic Advertiser List, and Clear Periodic Advertiser List commands.

- Reference

[9] 7.8.70, 7.8.71, 7.8.72

- Initial Condition

- The IUT is in standby.
- The IUT's Periodic Advertiser List is empty.

- Test Procedure

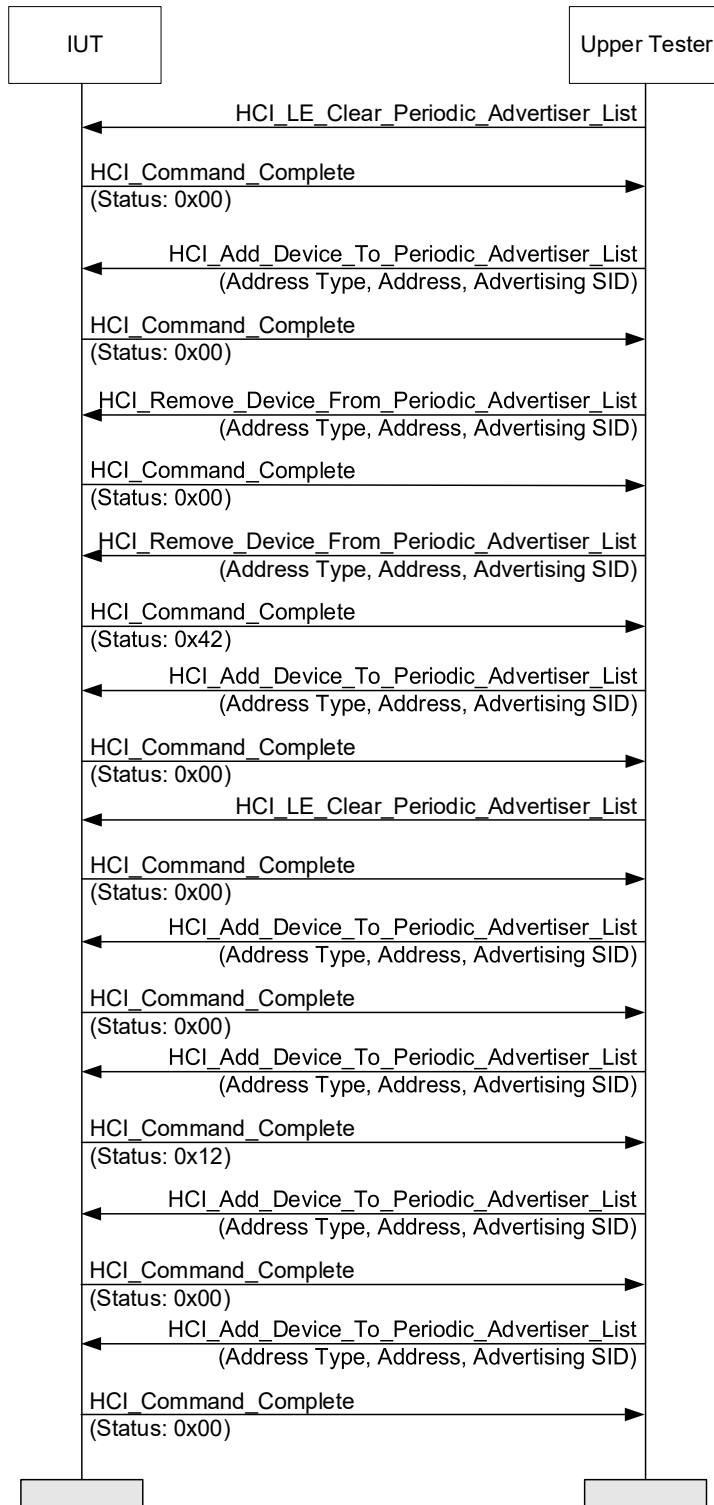


Figure 4.92: HCI/CCO/BV-17-C [LE Add/Remove/Clear Periodic Advertiser List Commands] MSC

1. The Upper Tester sends an HCI_LE_Clear_Periodic_Advertiser_List command to the IUT and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
2. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with an arbitrarily chosen valid address, address type, and SID and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
3. The Upper Tester sends an HCI_LE_Remove_Device_From_Periodic_Advertiser_List command to the IUT with the parameter values from Step 2 and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
4. The Upper Tester sends an HCI_LE_Remove_Device_From_Periodic_Advertiser_List command to the IUT with the parameter values from Step 2 and receives an HCI_Command_Complete event from the IUT with the Status set to 0x42 (Unknown Advertising Identifier).
5. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with with the same address, address type, and SID as used in Step 2 and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
6. The Upper Tester sends an HCI_LE_Clear_Periodic_Advertiser_List command to the IUT and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
7. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with the same address, address type, and SID as used in Step 2 and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
8. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with the same address, address type, and SID as used in Step 2 and receives an HCI_Command_Complete event from the IUT with Status set to 0x12 (Invalid HCI Command Parameters).
9. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with the same address and address type as used in Step 2 but a different SID and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).
10. The Upper Tester sends an HCI_LE_Add_Device_To_Periodic_Advertiser_List command to the IUT with the same address and SID as Step 2 but a different address type and receives an HCI_Command_Complete event from the IUT with Status set to 0x00 (Success).

- Expected Outcome

Pass verdict

The Upper Tester receives an HCI_Command_Complete event with the expected status for each command.

HCI/CCO/BV-18-C [LE Read Transmit Power Command]

- Test Purpose

Verify that the IUT correctly handles the LE Read Transmit Power Command.

- Reference

[9] 7.8.74

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an HCI_LE_Read_Transmit_Power Command.

The Upper Tester receives a Command Complete event from the IUT with Status set to 0x00 (Success) and values for Min_Tx_Power and Max_Tx_Power.



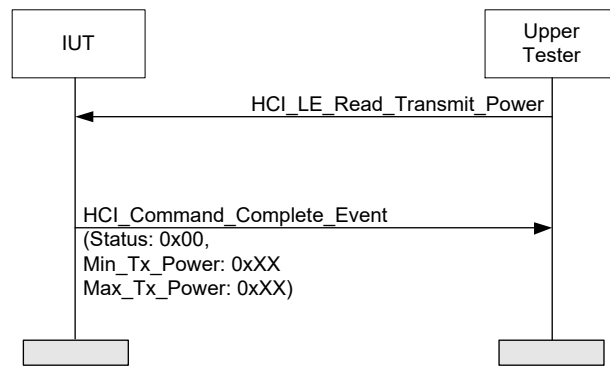


Figure 4.93: HCI/CCO/BV-18-C [LE Read Transmit Power Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete Event with Status = 0x00 (Success), Min_Tx_Power = 0xXX, and Max_Tx_Power = 0xXX after sending the LE Read Transmit Power command.

HCI/CCO/BV-19-C [LE Write RF Path Compensation Command]

- Test Purpose

Verify that the IUT correctly handles the LE Write RF Path Compensation Command.

- Reference

[9] 7.8.76

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an HCI_LE_Write_RF_Path_Compensation Command with RF_Tx_Path_Compensation_Value set to 0x0001 and RF_Rx_Path_Compensation_Value set to 0x0001.

The Upper Tester receives a Command Complete event from the IUT with Status set to 0x00 (Success).

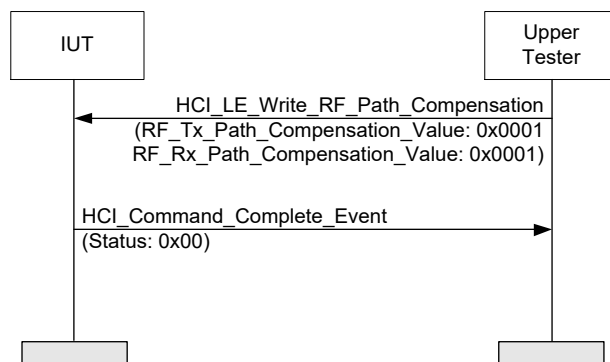


Figure 4.94: HCI/CCO/BV-19-C [LE Write RF Path Compensation Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete Event with Status = 0x00 (Success) after sending the LE Write RF Path Compensation Command.

HCI/CCO/BV-20-C [LE Read RF Path Compensation Command]

- Test Purpose

Verify that the IUT correctly handles the LE Read RF Path Compensation Command.

- Reference

[9] 7.8.75

- Initial Condition

- The IUT is in standby.

- Test Procedure

The Upper Tester issues an HCI_LE_Read_RF_Path_Compensation Command.

The Upper Tester receives a Command Complete event from the IUT with Status set to 0x00 (Success) and values for RF_Tx_Path_Compensation_Value and RF_Rx_Path_Compensation_Value.

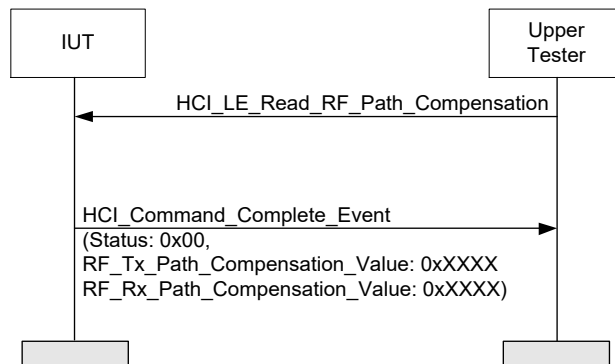


Figure 4.95: HCI/CCO/BV-20-C [LE Read RF Path Compensation Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete Event with Status = 0x00 (Success), RF_Tx_Path_Compensation_Value = 0xFFFF, and RF_Rx_Path_Compensation_Value = 0xFFFF after sending the LE Read RF Path Compensation Command.

HCI/CCO/BV-21-C [Set Minimum Encryption Key Size]

- Test Purpose

Verify that the IUT properly sets the minimum encryption key size.

- Reference

[13] 7.3.102

- Initial Condition
 - TSPX_min_encryption_key_size is the minimum encryption key size, as defined in the IXIT.
 - TSPX_max_encryption_key_size is the maximum encryption key size, as defined in the IXIT.
- Test Procedure

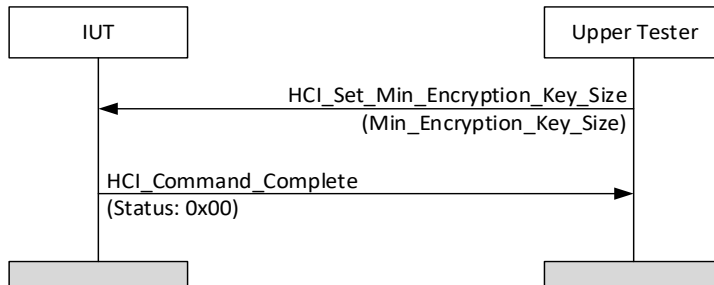


Figure 4.96: HCI/CCO/BV-21-C [Set Minimum Encryption Key Size] MSC

Repeat Steps 1 and 2 for each encryption key size value KS in the interval [TSPX_min_encryption_key_size, TSPX_max_encryption_key_size]:

- The Upper Tester sends an HCI_Set_Min_Encryption_Key_Size with the Min_Encryption_Key_Size set to KS.
- The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 2, the Upper Tester receives a successful HCI_Command_Complete event.

HCI/CCO/BV-27-C [Set Minimum Encryption Key Size, v6.2 or later]

- Test Purpose

Verify that the IUT that supports Core v6.2 or later properly sets the minimum encryption key size. The IUT returns an error when the encryption key size is less than $\max[7, \text{TSPX_min_encryption_key_size}]$.

- Reference

[13] 7.3.102

- Initial Condition
 - TSPX_min_encryption_key_size is the minimum encryption key size, as defined in the IXIT.
 - TSPX_max_encryption_key_size is the maximum encryption key size, as defined in the IXIT.

- Test Procedure

Repeat Steps 1 and 2 for each encryption key size value KS in the interval [1, TSPX_max_encryption_key_size]:

- The Upper Tester sends an HCI_Set_Min_Encryption_Key_Size with the Min_Encryption_Key_Size set to KS.
- Perform either alternative 2A or 2B depending on KS.

Alternative 2A ($\text{KS} \geq \text{TSPX_min_encryption_key_size}$):

 - 2A.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

Alternative 2B ($KS < TSPX_min_encryption_key_size$):

- 2B.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11.

- Expected Outcome

Pass verdict

In Step 2A.1, the Upper Tester receives a successful HCI_Command_Complete event.

In Step 2B.1, the Upper Tester receives an HCI_Command_Complete event with a 0x11 error code.

Fail verdict

$TSPX_min_encryption_key_size < 7$

HCI/CCO/BV-22-C [Read Clock Offset, Peripheral]

- Test Purpose

Verify that the Peripheral IUT Read Clock Offset command immediately returns a Read Clock Offset Complete event.

- Reference

[13] 7.1.24

- Initial Condition

- BR/EDR connection established, the IUT is Peripheral.

- Test Procedure

1. The Upper Tester sends an HCI_Read_Clock_Offset command to the IUT with Connection_Handle set to the current connection handle, and it receives a successful HCI_Command_Status event in return.
2. The IUT sends an HCI_Read_Clock_Offset_Complete event to the Upper Tester with Connection_Handle set to the current connection handle, and the Clock_Offset is set to the IUT's clock offset.

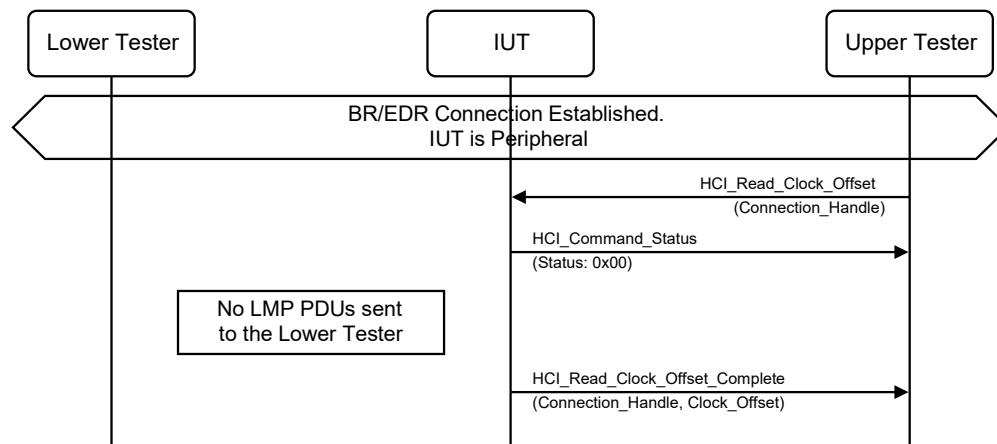


Figure 4.97: HCI/CCO/BV-22-C [Read Clock Offset, Peripheral] MSC

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Read_Clock_Offset_Complete event to the Upper Tester. The IUT does not send LMP PDUs between Steps 1 and 2.

Fail verdict

The IUT sends an LMP PDU between Steps 1 and 2.

HCI/CCO/BV-23-C [LE Set Extended Advertising Parameters, Advertising Coding Selection Not Supported]

- Test Purpose

Verify that the IUT properly returns an error in response to the LE Set Extended Advertising Parameters [v2] command when the IUT does not support the Advertising Coding Selection feature.

- Reference

[13] 7.8.53

- Initial Condition

- The IUT is configured in an advertising state.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters [v2] command to the IUT with Primary_Advertising_PHY and Secondary_Advertising_PHY set to 0x03, Primary_Advertising_PHY_Options set to 0x01, and Secondary_Advertising_PHY_Options set to 0x00.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11 ("Unsupported Feature or Parameter Value").
3. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters [v2] command to the IUT with Primary_Advertising_PHY and Secondary_Advertising_PHY set to 0x03, Primary_Advertising_PHY_Options set to 0x00, and Secondary_Advertising_PHY_Options set to 0x01.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11 ("Unsupported Feature or Parameter Value").
5. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters [v2] command to the IUT with Primary_Advertising_PHY and Secondary_Advertising_PHY set to 0x03 and Primary_Advertising_PHY_Options and Secondary_Advertising_PHY_Options both set to 0x00.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

- Expected Outcome

Pass verdict

In Steps 2 and 4, the IUT returns an error in the HCI_Command_Complete event.

In Step 6, the IUT returns a successful HCI_Command_Complete event.

HCI/CCO/BI-75-C [LE Frame Space Update, Invalid Frame Space Parameters]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Frame Space Update command.

- Reference

[19] 7.7.65.48

- Initial Condition

- The LL connection is established, the IUT is Central or Peripheral, and T_IFS = 150 µs.

- Test Procedure

- The Upper Tester sends an HCI_LE_Frame_Space_Update command to the IUT with the Parameters specified in Table 4.34.
- Perform either alternative 2A or 2B depending on the IUT HCI_Command_Status response.
Alternative 2A (Successful HCI_Command_Status):
 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_Frame_Space_Update_Complete event to the Upper Tester with Status set as specified in Table 4.34.
 Alternative 2B (HCI_Command_Status with an error code):
 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set as specified in Table 4.34.

Round	Parameters	Error
1	Frame_Space_Min = 0x2711	0x12
2	Frame_Space_Max = 0x2711	0x12
3	Connection_Handle != ACL connection handle	0x02
4	PHYs = 0x00	0x12
5	Spacing_Type = 0x00	0x12
6	Frame_Space_Min = 1, Frame_Space_Max = 0	0x12

Table 4.34: LE Frame Space Update, Invalid Parameters rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT rejects the command with the specified error code.

4.10.1 LE CS Set Procedure Parameters, Invalid Parameters

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Set_Procedure_Parameters command with invalid parameters.

- Reference

[19] 7.8.140

- Initial Condition
 - The IUT and the Lower Tester have an encrypted connection, exchanged capabilities, created a configuration with Config_ID set to 0, and set default settings.
 - The max CS procedure count is defined by the TSPX_CS_Max_Procedure_Count IXIT value.
- Test Case Configuration

Test Case	Rounds to perform
HCI/CCO/BI-116-C [LE CS Set Procedure Parameters, Invalid Parameters, v6.0]	1 to 4
HCI/CCO/BI-123-C [LE CS Set Procedure Parameters, Invalid Parameters, v6.1]	1 to 5

Table 4.35: LE CS Set Procedure Parameters, Invalid Parameters test cases

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.36](#). Each round has an interval of 1.25 seconds. Rounds 1 and 2 are executed only if TSPX_CS_Max_Procedure_Count > 1 or TSPX_CS_Max_Procedure_Count = 0.

 - The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with Config_ID set to 0, Max_Procedure_Count = 2, parameters set as specified in [Table 4.36](#), and all other parameters set to valid values.
 - The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Round	Parameter	Value
1	Max_Procedure_Interval	0
2	Min_Procedure_Interval	0
3	Min_Subevent_Len	1249
4	Max_Subevent_Len	40000001
5	Max_Subevent_Len	40000000

Table 4.36: LE CS Set Procedure Parameters, Invalid Parameters rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with Status set to 0x12.

[HCI/CCO/BI-117-C \[HCI CS Command, Unencrypted ACL\]](#)

- Test Purpose

Verify that the IUT properly returns an error when the Upper Tester sends HCI CS commands that start an LL exchange with an unencrypted ACL connection with the Lower Tester.
- Initial Condition
 - The IUT and the Lower Tester have an unencrypted ACL connection.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.37](#).

1. The Upper Tester sends an HCI command in [Table 4.37](#).
2. Perform alternative 2A or 2B depending on the IUT response.

Alternative 2A (HCI_Command_Status event with an error code):

- 2A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status > 0.

Alternative 2B (Successful HCI_Command_Status event followed by an HCI event with an error):

- 2B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
- 2B.2 The IUT sends an HCI event specified in [Table 4.37](#) with Status > 0.

Round	Reference	HCI Command/HCI Event	LL PDU
1	[19] 7.8.131	HCI_LE_CS_Read_Remote_Supported_Capabilities HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete	LL_CS_CAPABILITIES_REQ
2	[19] 7.8.135	HCI_LE_CS_Read_Remote_FAE_Table HCI_LE_CS_Read_Remote_FAE_Table_Complete	LL_CS_FAE_REQ
3	[19] 7.8.137	HCI_LE_CS_Create_Config HCI_LE_CS_Config_Complete	LL_CS_CONFIG_REQ

Table 4.37: HCI CS Command, Unencrypted ACL rounds

- Expected Outcome

Pass verdict

In Step 2A.1 or 2B.2, the IUT sends an HCI event to the Upper Tester with an error code.

Fail verdict

After Step 2B.1, the IUT sends the LL PDU specified in [Table 4.37](#) on the unencrypted ACL.

4.10.2 Resolving List Commands fail when list in use

- Test Purpose

Verify that the IUT correctly fails the Resolving List commands when the resolving list is in use.

- Reference

[\[2\]](#) 7.8.38, 7.8.39, 7.8.40, 7.8.44, 7.8.77

- Initial Condition

- The IUT is in standby.
- The IUT has address resolution enabled with at least one device identity added to the resolving list.

- Test Procedure

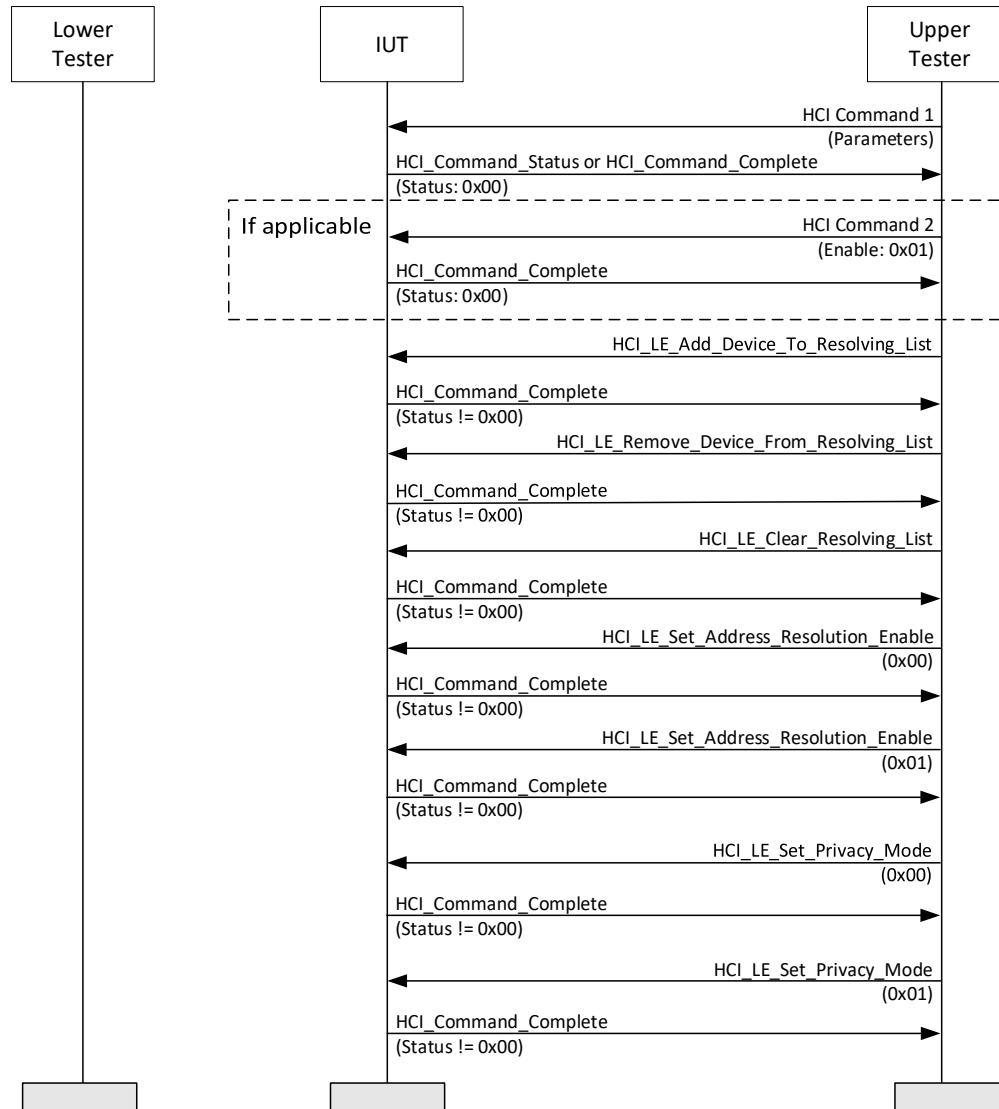


Figure 4.98: Resolving List Commands fail when list in use MSC

The Upper Tester issues the one or two commands specified in [Table 4.38](#) to the IUT and receives a successful HCI_Command_Complete or HCI_Command_Status event in return for each.

The Upper Tester issues each of the following commands to the IUT and receives an HCI_Command_Complete event with a non-zero status in reply for each:

- HCI_LE_Add_Device_To_Resolving_List
- HCI_LE_Remove_Device_From_Resolving_List
- HCI_LE_Clear_Resolving_List
- HCI_LE_Set_Address_Resolution_Enable (Address_Resolution_Enable = 0x00)
- HCI_LE_Set_Address_Resolution_Enable (Address_Resolution_Enable = 0x01)
- HCI_LE_Set_Privacy_Mode (Peer_Identity_Address_Type = 0x00)
- HCI_LE_Set_Privacy_Mode (Peer_Identity_Address_Type = 0x01)

- Test Case Configuration

Test Case	Reference	HCI Command(s)
HCI/CCO/BI-01-C	[2] 7.8.38	HCI_LE_Set_Advertising_Parameters (Advertising_Type: 0x03) HCI_LE_Set_Advertising_Enable (Advertising_Enable: 0x01)
HCI/CCO/BI-02-C	[2] 7.8.39	HCI_LE_Set_Scan_Parameters (LE_Scan_Type: 0x01) HCI_LE_Set_Scan_Enable (LE_Scan_Enable: 0x01)
HCI/CCO/BI-03-C	[2] 7.8.40	HCI_LE_Create_Connection (Initiator_Filter_Policy: 0x00)
HCI/CCO/BI-04-C	[2] 7.8.44	HCI_LE_Extended_Create_Connection (Initiator_Filter_Policy: 0x00)
HCI/CCO/BI-05-C	[2] 7.8.77	HCI_LE_Periodic_Advertising_Create_Sync (Options: 0x00)

Table 4.38: Resolving List Commands fail when list in use test cases

All command parameters not explicitly listed in the table may have any valid value.

- Expected Outcome

Pass verdict

The Upper Tester receives an HCI_Command_Complete event from the IUT with non-zero status when sending each Resolving List command.

4.10.3 Invalid LE Power Control HCI Parameters

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for LE Power Control related HCI commands.

- Reference

[\[12\]](#) 7.8

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester in the relevant role.

- Test Procedure

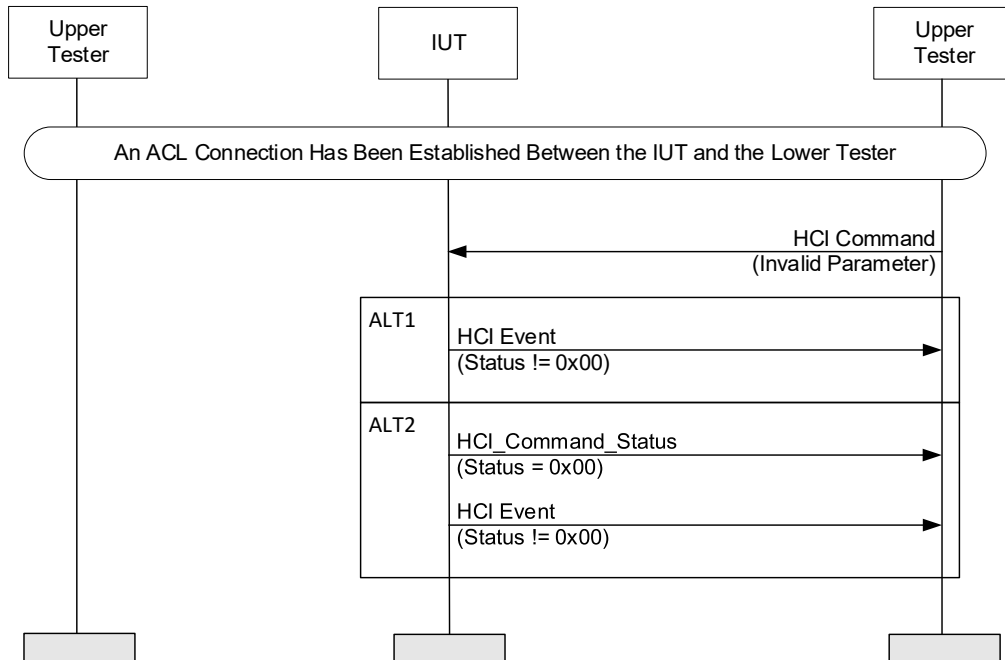


Figure 4.99: Invalid LE Power Control HCI Parameters MSC

1. The Upper Tester sends the HCI Command and Parameter as specified in [Table 4.39](#).
2. The IUT sends the Event and Status/Error Code as specified in [Table 4.39](#) to the Upper Tester.

- Test Case Configuration

Test Case	HCI Command	Parameter	Event and Status/Error Code
HCI/CCO/BI-06-C [LE Enhanced Read Transmit Power Level – Invalid Connection Handle]	HCI_LE_Enhanced_Read_Transmit_Power_Level	Connection_Handle set to an invalid ACL	HCI_Command_Complete : Unknown Connection Identifier (0x02)
HCI/CCO/BI-07-C [LE Enhanced Read Transmit Power Level – Invalid PHY]	HCI_LE_Enhanced_Read_Transmit_Power_Level	PHY = 0xF0	HCI_Command_Complete : Unsupported Feature or Parameter Value (0x11)
HCI/CCO/BI-08-C [LE Read Remote Transmit Power Level – Invalid Connection Handle]	HCI_LE_Read_Remote_Transmit_Power_Level	Connection_Handle set to an invalid ACL	HCI_Command_Status : Unknown Connection Identifier (0x02) or HCI_Command_Status : Status(0x00) HCI_LE_Transmit_Power_Reporting event : Status (0x02)

Test Case	HCI Command	Parameter	Event and Status/Error Code
HCI/CCO/BI-09-C [LE Read Remote Transmit Power Level – Invalid PHY]	HCI_LE_Read_Remote_Transmit_Power_Level	PHY = 0xF0	HCI_Command_Status : Unsupported Feature or Parameter Value (0x11) or HCI_Command_Status : Status(0x00) HCI_LE_Transmit_Power_Reporting event : Status (0x11)
HCI/CCO/BI-10-C [LE Set Path Loss Reporting Parameters – Invalid Connection Handle]	HCI_LE_Set_Path_Loss_Reporting_Parameters	Connection_Handle set to an invalid ACL	HCI_Command_Complete : Unknown Connection Identifier (0x02)
HCI/CCO/BI-11-C [LE Set Path Loss Reporting Enable – Invalid Connection Handle]	HCI_LE_Set_Path_Loss_Reporting_Enable	Connection_Handle set to an invalid ACL	HCI_Command_Complete : Unknown Connection Identifier (0x02)
HCI/CCO/BI-12-C [LE Set Transmit Power Reporting Enable – Invalid Connection Handle]	HCI_LE_Set_Transmit_Power_Reporting_Enable	Connection_Handle set to an invalid ACL	HCI_Command_Complete : Unknown Connection Identifier (0x02)

Table 4.39: Invalid LE Power Control HCI Parameters test cases

- Expected Outcome

Pass verdict

In Step 2, the IUT returns the Status as specified in [Table 4.39](#).

HCI/CCO/BI-13-C [Invalid Path Loss Monitoring Parameters]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for LE Path Loss Reporting-related HCI commands.

- Reference

[\[12\]](#) 7.8.119

- Initial Condition

- Parameters: TSPX_Path_Loss_Lower_Boundary, TSPX_Path_Loss_Upper_Boundary (specified in LL IXIT). The Lower Tester and the IUT are configured as specified in the RF Test Conditions section in [\[5\]](#).
- An ACL connection has been established between the IUT and the Lower Tester in the relevant role.

- Test Procedure

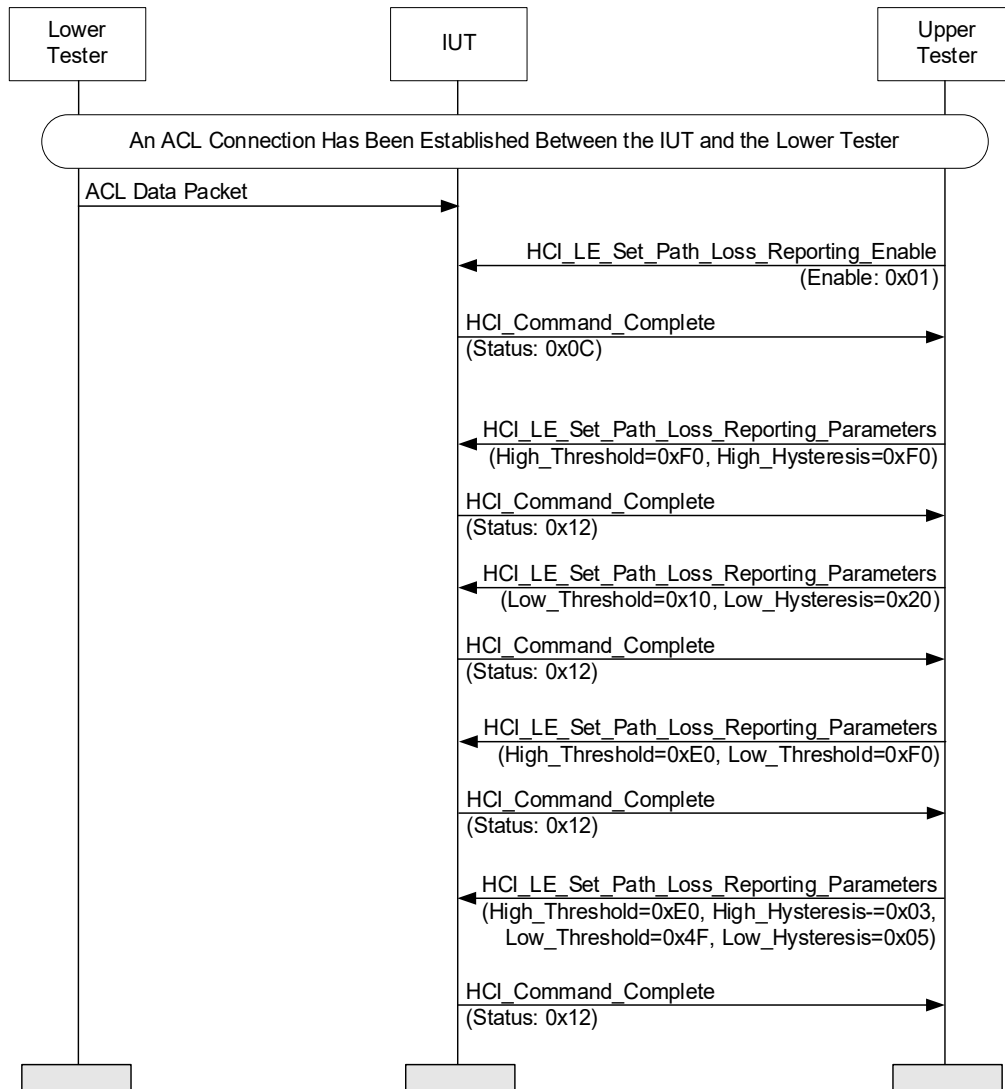


Figure 4.100: HCI/CCO/BI-13-C [Invalid Path Loss Monitoring Parameters] MSC

1. The Lower Tester continuously transmits empty data packets over the ACL connection with a connection interval of 7.5 ms.
2. The Upper Tester enables path loss reporting for the active connection by sending an HCI_LE_Set_Path_Loss_Reporting_Enable command to the IUT with the Connection_Handle corresponding to the active connection and Enable = 0x01. The IUT responds with an HCI_Command_Complete with Status=0x0C.
3. The Upper Tester sends an HCI_LE_Set_Path_Loss_Reporting_Parameters command to the IUT, with the following parameter values: Connection_Handle set to the active connection handle, High_Threshold = 0xF0, High_Hysteresis = 0xF0. The IUT responds with an HCI_Command_Complete with Status = 0x12.
4. The Upper Tester sends an HCI_LE_Set_Path_Loss_Reporting_Parameters command to the IUT, with the following parameter values: Connection_Handle set to the active connection handle, Low_Threshold = 0x10, Low_Hysteresis = 0x20. The IUT responds with an HCI_Command_Complete with Status = 0x12.

5. The Upper Tester sends an HCI_LE_Set_Path_Loss_Reporting_Parameters command to the IUT, with the following parameter values: Connection_Handle set to the active connection handle, High_Threshold = 0xE0, Lower_Threshold 0xF0. The IUT responds with an HCI_Command_Complete with Status = 0x12.
6. The Upper Tester sends an HCI_LE_Set_Path_Loss_Reporting_Parameters command to the IUT, with the following parameter values: Connection_Handle set to the active connection handle, High_Threshold = 0x50, High_Hysteresis = 0x03 (3dB), Low_Threshold = 0x4F, Low_Hysteresis = 0x05 (5 dB). The IUT responds with an HCI_Command_Complete with Status = 0x12.

- Note

Note that the RF Test Conditions in [5] provides flexibility in how the IUT's receive power is adjusted, and the means by which the apparent Path Loss is induced in the IUT may vary. An initial condition is chosen such that the apparent Path Loss as seen by the IUT can be varied across the supported Middle and Low Zone boundary.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends the HCI_Command_Complete event with Status = 0x0C to the Upper Tester.

In Steps 3–6, the IUT sends the HCI_Command_Complete event with Status = 0x12 to the Upper Tester.

4.10.4 Validate Unsupported Packet Types are Not Accepted

- Test Purpose

Verify that the IUT properly does not support unsupported Packet Types.

- Reference

[12] 7.1.5, 7.1.14, A.5

- Initial Condition

- Initial Condition as specified in Table 4.40.

- Test Procedure

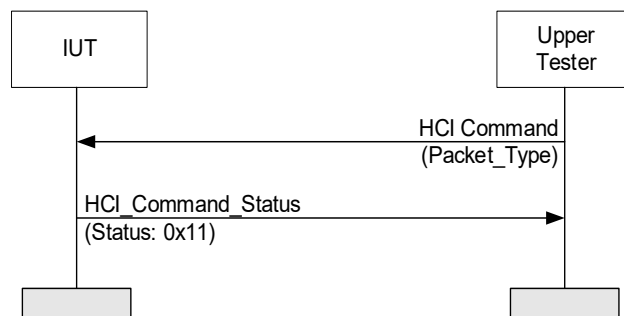


Figure 4.101: Validate Unsupported Packet Types are Not Accepted, Create Connection MSC

1. The Upper Tester sends the HCI command as specified in Table 4.40 to the IUT with the Packet_Type parameter set to the Packet Type as specified in Table 4.40.
2. The IUT sends the HCI_Command_Status event to the Upper Tester with Status = Unsupported Feature or Parameter Value (0x11).

- Test Case Configuration

Test Case	Reference	Initial Condition	HCI Command	Packet Type
HCI/CCO/BI-14-C [Validate Unsupported Packet Types are Not Accepted, Create Connection, 3-slot]	[12] Section 7.1.5	The IUT is not connected.	HCI_Create_Connection	0x0C00
HCI/CCO/BI-15-C [Validate Unsupported Packet Types are Not Accepted, Create Connection, 5-slot]	[12] Section 7.1.5	The IUT is not connected.	HCI_Create_Connection	0xC000
HCI/CCO/BI-16-C [Validate Unsupported Packet Types are Not Accepted, Change Connection Packet Type, 3-slot]	[12] Section 7.1.14	The IUT is connected to the Lower Tester.	HCI_Change_Connection_Packet_Type	0x0C00
HCI/CCO/BI-17-C [Validate Unsupported Packet Types are Not Accepted, Change Connection Packet Type, 5-slot]	[12] Section 7.1.14	The IUT is connected to the Lower Tester.	HCI_Change_Connection_Packet_Type	0xC000

Table 4.40: Validate Unsupported Packet Types are Not Accepted test cases

- Expected Outcome

Pass verdict

In Step 2, the IUT sends the HCI_Command_Status event with Status = 0x11 to the Upper Tester.

4.10.5 Error Response for Commands not supporting all transports, Command Complete Response

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending commands not supporting all transports on a transport with a handle or connection handle. Also, unsupported events on a transport should not be generated.

- Reference

[12] 3.2

- Initial Condition

- An ACL connection has been established on the transport as specified in Table 4.41 between the IUT and the Lower Tester.

- Test Procedure

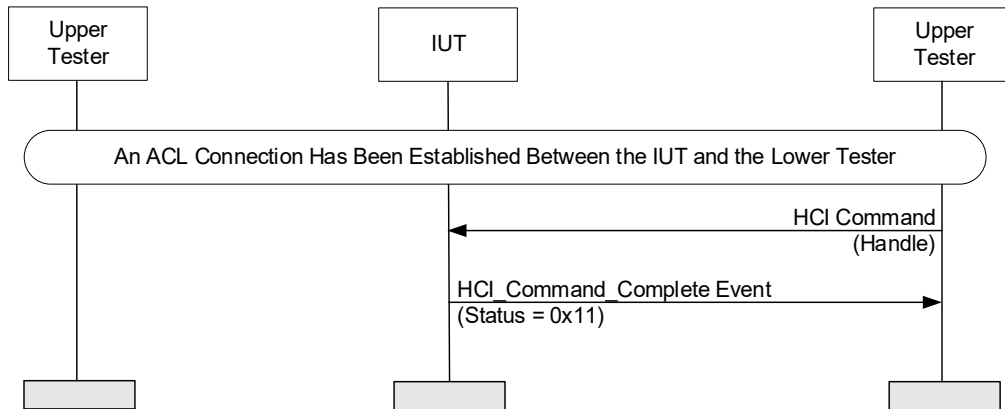


Figure 4.102: Error Response for Commands not supporting all transports, Command Complete Response MSC

1. The Upper Tester sends the HCI Command and Parameter as specified in [Table 4.41](#).
2. The IUT sends the HCI_Command_Complete Event to the Upper Tester with Status = Unsupported Feature or Parameter value (0x11).

- Test Case Configuration

Test Case	HCI Command	Parameter	Transport
HCI/CCO/BI-18-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Authenticated Payload Timeout, BR/EDR]	HCI_Read_Authenticated_Payload_Timeout	Connection_Handle	BR/EDR
HCI/CCO/BI-19-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Authenticated Payload Timeout, LE]	HCI_Read_Authenticated_Payload_Timeout	Connection_Handle	LE
HCI/CCO/BI-20-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Link Quality, BR/EDR]	HCI_Read_Link_Quality	Handle	BR/EDR
HCI/CCO/BI-21-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Link Quality, AMP]	HCI_Read_Link_Quality	Handle	AMP
HCI/CCO/BI-22-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Link Supervision Timeout, BR/EDR]	HCI_Read_Link_Supervision_Timeout	Handle	BR/EDR
HCI/CCO/BI-25-C [Error Response for Commands not supporting all transports, Command Complete Response, Read RSSI, BR/EDR]	HCI_Read_RSSI	Handle	BR/EDR
HCI/CCO/BI-26-C [Error Response for Commands not supporting all transports, Command Complete Response, Read RSSI, AMP]	HCI_Read_RSSI	Handle	AMP

Test Case	HCI Command	Parameter	Transport
HCI/CCO/BI-27-C [Error Response for Commands not supporting all transports, Command Complete Response, Read RSSI, LE]	HCI_Read_RSSI	Handle	LE
HCI/CCO/BI-28-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Transmit Power Level, BR/EDR]	HCI_Read_Transmit_Power_Level	Connection_Handle	BR/EDR
HCI/CCO/BI-29-C [Error Response for Commands not supporting all transports, Command Complete Response, Read Transmit Power Level, LE]	HCI_Read_Transmit_Power_Level	Connection_Handle	LE
HCI/CCO/BI-30-C [Error Response for Commands not supporting all transports, Command Complete Response, Write Authenticated Payload Timeout, BR/EDR]	HCI_Write_Authenticated_Payload_Timeout	Connection_Handle	BR/EDR
HCI/CCO/BI-31-C [Error Response for Commands not supporting all transports, Command Complete Response, Write Authenticated Payload Timeout, LE]	HCI_Write_Authenticated_Payload_Timeout	Connection_Handle	LE
HCI/CCO/BI-32-C [Error Response for Commands not supporting all transports, Command Complete Response, Write Link Supervision Timeout, BR/EDR]	HCI_Write_Link_Supervision_Timeout	Handle	BR/EDR

Table 4.41: Error Response for Commands not supporting all transports, Command Complete Response test cases

- Expected Outcome

Pass verdict

In Step 2, the IUT returns the Status = 0x11 in the HCI_Command_Complete Event.

4.10.6 Error Response for Commands not supporting all transports, Command Status Response

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending commands not supporting all transports with a handle or connection handle. Also, events not supported on a transport should not be generated.

- Reference

[12] 3.2

- Initial Condition

- An ACL connection has been established on the transport as specified in Table 4.42 between the IUT and the Lower Tester.

- Test Procedure

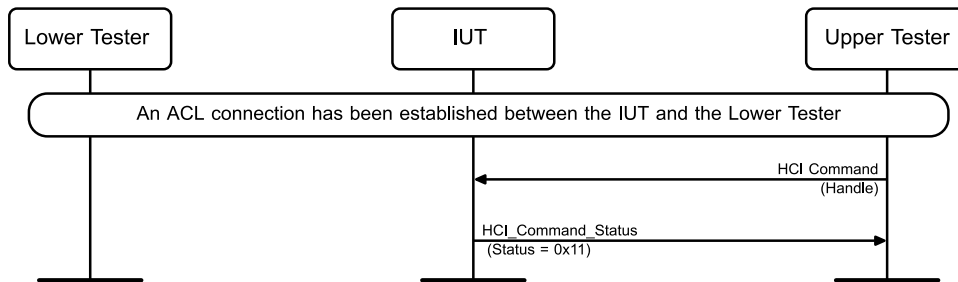


Figure 4.103: Error Response for Commands not supporting all transports, Command Status Response MSC

1. The Upper Tester sends the HCI Command and Parameter specified in [Table 4.42](#).
2. The IUT sends the HCI_Command_Status event to the Upper Tester with Status = Unsupported Feature or Parameter value (0x11).

- Test Case Configuration

Test Case	HCI Command	Parameter	Transport
HCI/CCO/BI-23-C [Error Response for Commands not supporting all transports, Command Status Response, Read Remote Version Information, BR/EDR]	HCI_Read_Remote_Version_Information	Connection_Handle	BR/EDR
HCI/CCO/BI-24-C [Error Response for Commands not supporting all transports, Command Status Response, Read Remote Version Information, LE]	HCI_Read_Remote_Version_Information	Connection_Handle	LE

Table 4.42: Error Response for Commands not supporting all transports, Command Status Response test cases

- Expected Outcome

Pass verdict

In Step 2, the IUT returns the Status = 0x11 in the HCI_Command_Status event.

[HCI/CCO/BI-33-C \[Invalid LE Set Periodic Advertising Data Parameters\]](#)

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for LE Set Periodic Advertising Data related HCI commands when Periodic Advertising ADI is supported.

- Reference

[\[13\]](#) 7.8.62

- Initial Condition

- The IUT is in standby.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT using all supported advertising channels and a selected advertising interval between the minimum and maximum advertising intervals supported. The Advertising_Event_Properties parameter is set to 0x0000, Own_Address_Type is set to 0x00 (Public Device Address),

- Primary_Advertising_PHY is set to 0x01 (LE 1M), Secondary_Advertising_PHY is set to 0x01 (LE 1M) and receives a successful HCI_Command_Complete event in return.
2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 1, using minimum periodic advertising interval and receives a successful HCI_Command_Complete event in return.
 3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 1, Operation set to 0x03, and Advertising_Data_Length set to 100 using 100 random octets from 1 to 254 as the payload and receives a successful HCI_Command_Complete event in return.
 4. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 1, Operation set to 0x04.
 5. The IUT sends an HCI_Command_Complete event with error code Invalid HCI Command Parameters (0x12) to the Upper Tester.
 6. The Upper Tester enables periodic advertising using the HCI_LE_Set_Periodic_Advertising_Enable command Enable Bit 0 (Periodic Advertising) set to 1 and the Advertising_Handle set to the Advertising_Handle in Step 1, and receives a successful HCI_Command_Complete event in return.
 7. The Upper Tester enables advertising using the HCI_LE_Set_Extended_Advertising_Enable command. The Duration[0] parameter is set to 0x0000 (No Advertising Duration).
 8. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Operation set to 0x04 and Advertising_Data_Length set to 100 using 100 random octets from 1 to 254 as the payload.
 9. The IUT sends an HCI_Command_Complete event with error code Invalid HCI Command Parameters (0x12) to the Upper Tester.
 10. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Operation set to 0x04 and Advertising_Data_Length set to 0 and receives a successful HCI_Command_Complete event in return.
 11. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 1, Operation set to 0x03, and Advertising_Data_Length set to 0 and receives a successful HCI_Command_Complete event in return.
 12. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Data command to the IUT with Advertising_Handle set to the Advertising_Handle in Step 1, Operation set to 0x04.
 13. The IUT sends an HCI_Command_Complete event with error code Invalid HCI Command Parameters (0x12) to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 5, the IUT returns an HCI_Command_Complete event with the Invalid HCI Command Parameters (0x12) error code.

In Step 9, the IUT returns an HCI_Command_Complete event with the Invalid HCI Command Parameters (0x12) error code.

In Step 10, the IUT returns a successful HCI_Command_Complete event.

In Step 13, the IUT returns an HCI_Command_Complete event with the Invalid HCI Command Parameters (0x12) error code.

HCI/CCO/BI-34-C [Invalid LE Set Periodic Advertising Enable Parameters, Periodic Advertising ADI Not Supported]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for LE Set Periodic Advertising Enable related HCI commands when Periodic Advertising ADI is not supported.

- Reference

[13] 7.8.63

- Initial Condition

- The IUT is in standby. Extended advertising parameters and periodic advertising parameters have been configured on the IUT for a particular advertising handle.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with the Enable bits 0 and 1 set to 1.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to a valid error code.
3. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Enable command to the IUT with Enable bit 0 set to 0 and Enable bit 1 set to 1.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to a valid error code.

- Expected Outcome

Pass verdict

In Steps 2 and 4, the IUT returns an HCI_Command_Complete event with Status set to a valid error code.

HCI/CCO/BI-35-C [Invalid Set Min Encryption Key Size Parameters]

- Test Purpose

Verify that the IUT properly rejects an unsupported encryption key size.

- Reference

[13] 7.3.102

- Initial Condition

- TSPX_min_encryption_key_size is the minimum encryption key size, as defined in the IXIT.

- Test Procedure

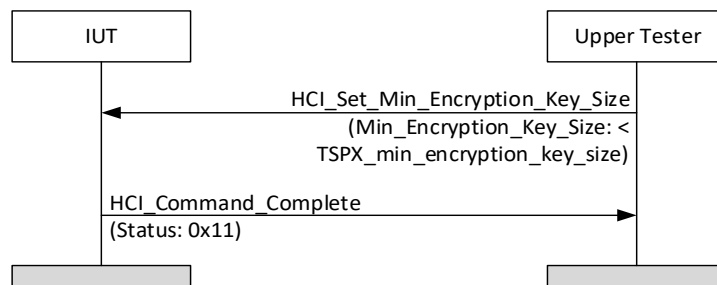


Figure 4.104: HCI/CCO/BI-35-C [Invalid Set Min Encryption Key Size Parameters] MSC

1. The Upper Tester sends an HCI_Set_Min_Encryption_Key_Size with the Min_Encryption_Key_Size set to TSPX_min_encryption_key_size – 1.
2. The IUT sends an HCI_Command_Complete event with the Unsupported Feature or Parameter Value (0x11) error code to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 2, the HCI_Command_Complete event has the Unsupported Feature or Parameter Value (0x11) error code.

Inconclusive verdict

TSPX_min_encryption_key_size is 0x01, which prevents the Upper Tester from requesting a smaller Min_Encryption_Key_Size.

4.10.7 Invalid Subrate Parameters

- Test Purpose

Verify that the IUT properly handles invalid parameters passed in from the Upper Tester. Invalid parameters include when the connection handle is not a valid ACL connection as well as verifying that the parameters are within acceptable ranges.

- Reference

[13] 7.8.123, 7.8.124

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester in the relevant role with a connection interval of 10 ms.

- Test Case Configuration

Test Case	HCI Command / Error Event	Perform Steps 1 and 2	Perform round 9
HCI/CCO/BI-36-C	HCI_LE_Subrate_Request HCI_Command_Status	Yes	Yes
HCI/CCO/BI-37-C	HCI_LE_Set_Default_Subrate HCI_Command_Complete	No	No

Table 4.43: Invalid Subrate Parameters test cases

- Test Procedure

1. The Upper Tester sends an HCI_LE_Subrate_Request command to the IUT with a Connection_Handle that is not an ACL connection.
2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).
3. Repeat Steps 4 and 5 for each round in [Table 4.44](#).
4. The Upper Tester sends the HCI command as specified in [Table 4.43](#) with the parameters as specified in [Table 4.44](#).
5. The IUT sends the Error Event as specified in [Table 4.43](#) to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).

Round	Parameters	Requirement Violated
1	Subrate_Min = 0 Subrate_Max = 2 Max_Latency = 2 Continuation_Number = 0 Supervision_Timeout = 500 ms	Subrate_Min $\geq$ 1
2	Subrate_Min = 4 Subrate_Max = 3 Max_Latency = 2 Continuation_Number = 0 Supervision_Timeout = 500 ms	Subrate_Min $\leq$ Subrate_Max
3	Subrate_Min = 501 Subrate_Max = 500 Max_Latency = 500 Continuation_Number = 0 Supervision_Timeout = 500 ms	Subrate_Min $\leq$ 500
4	Subrate_Min = 2 Subrate_Max = 501 Max_Latency = 2 Continuation_Number = 0 Supervision_Timeout = 500 ms	Subrate_Max $\leq$ 500
5	Subrate_Min = 2 Subrate_Max = 3 Max_Latency = 0x1F4 Continuation_Number = 0 Supervision_Timeout = 500 ms	Max_Latency $\leq$ 0x01F3
6	Subrate_Min = 2 Subrate_Max = 0x01F4 Max_Latency = 2 Continuation_Number = 0x01F4 Supervision_Timeout = 500 ms	Continuation_Number $\leq$ 0x01F3
7	Subrate_Min = 2 Subrate_Max = 3 Max_Latency = 3 Continuation_Number = 0 Supervision_Timeout = 0x0009	Supervision_Timeout $\geq$ 0x000A
8	Subrate_Min = 2 Subrate_Max = 3 Max_Latency = 3 Continuation_Number = 0 Supervision_Timeout = 0x0C81	Supervision_Timeout $\leq$ 0x0C80
9	Subrate_Min = 25 Subrate_Max = 25 Max_Latency = 5 Continuation_Number = 0 Supervision_Timeout = 2 sec (0xC8)	$(connInterval_{current} \times Subrate_Max \times (Max_Latency + 1)) \times 2 \leq Supervision_Timeout$

Round	Parameters	Requirement Violated
10	Subrate_Min = 3 Subrate_Max = 5 Max_Latency = 2 Continuation_Number = 5 Supervision_Timeout = 500 ms	Continuation_Number < Subrate_Max

Table 4.44: Invalid Subrate Parameters rounds

- Expected Outcome

Pass verdict

In Step 3, the IUT returns an Unknown Connection Identifier (0x02) status.

In Step 5, the IUT returns an Invalid HCI Command Parameters (0x12) status.

HCI/CCO/BI-38-C [Invalid Connection CTE Request Enable Parameters]

- Test Purpose

Verify that the IUT properly handles invalid parameters passed in from the Upper Tester to the HCI_LE_Connection_CTE_Request_Enable command.

- Reference

[13] 7.8.85

- Initial Condition

- LL connection is established. The IUT is Central or Peripheral.
- The subrate factor is 3, the continuation number is 0, and the Peripheral latency is 1.

- Test Procedure

- The Upper Tester sends an HCI_LE_Subrate_Request to the IUT with Subrate_Min, Subrate_Max, and Max_Latency set as specified in Table 4.45 and receives a successful HCI_Command_Status event in return.
- The IUT sends a successful HCI_LE_Subrate_Change event to the Upper Tester with Subrate_Factor and Connection_Latency with the same values as received in Step 1.
- The Upper Tester sends an HCI_LE_Set_Connection_CTE_Receive_Parameters command to the IUT with the Connection_Handle set to the current connection handle and receives a successful HCI_Command_Complete event in return.
- Repeat Steps 5, 6, and 7 for CTE_Request_Intervals between 1 and 10.
- The Upper Tester sends an HCI_LE_Connection_CTE_Request_Enable command to the IUT with Enable set to 0x01 and CTE_Request_Interval.
- The IUT sends an HCI_Command_Complete event to the Upper Tester with error code set to Command Disallowed (0x0C) if the CTE_Request_Interval is less than the Acceptable CTE Request Interval in Table 4.45, otherwise the IUT sends a successful HCI_Command_Complete event to the Upper Tester.
- If the HCI Command Complete in Step 6 is successful, then the Upper Tester sends an HCI_LE_Connection_CTE_Request_Enable command to the IUT with Enable set to 0x00 and receives a successful HCI_Command_Complete event.

Round	Subrate Min and Max	Max_Latency	Acceptable CTE Request Interval
1	1	3	4
2	3	2	9
3	5	0	5

Table 4.45: HCI/CCO/BI-38-C [Invalid Connection CTE Request Enable Parameters] rounds

- Expected Outcome

Pass verdict

In Step 6, the IUT sends a successful HCI_Command_Complete event to the Upper Tester when the CTE_Request_Interval in Step 5 is set to a value $\geq$ Acceptable CTE Request Interval in Table 4.45, otherwise a Command Disallowed (0x0C) error is returned.

HCI/CCO/BI-39-C [Invalid Write Authenticated Payload Timeout Parameters]

- Test Purpose

Verify that the IUT properly handles invalid parameters passed in from the Upper Tester to the HCI_Write_Authenticated_Payload_Timeout command.

- Reference

[13] 7.3.94

- Initial Condition

- LL connection is established. The IUT is Central or Peripheral.
- The connection interval is 10 ms, subrate factor is 3, continuation number is 0, and the Peripheral latency is 2.

- Test Procedure

1. The Upper Tester sends an HCI_Write_Authenticated_Payload_Timeout command to the IUT with an Authenticated_Payload_Timeout set to 0x0008 (80 ms).
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with any valid error code.
3. The Upper Tester sends an HCI_Write_Authenticated_Payload_Timeout command to the IUT with an Authenticated_Payload_Timeout set to 0x0009 (90 ms).
4. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with any valid error code. The Upper Tester gives a warning if the error code is not Command Disallowed (0x0C).

In Step 4, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

HCI/CCO/BI-40-C [LE Set Data Length, Invalid Parameters]

- Test Purpose

Verify that the IUT correctly returns an error when calling the LE_Set_Data_Length command with invalid parameters.

- Reference

[2] 7.8.33

- Initial Condition

- LL connection established, the IUT is Central or Peripheral.

- Test Procedure

The Upper Tester issues an LE_Set_Data_Length command to the IUT with Tx_Time set to 17041.

The Upper Tester receives a Command_Complete event from the IUT with an Invalid Parameters (0x12) error.

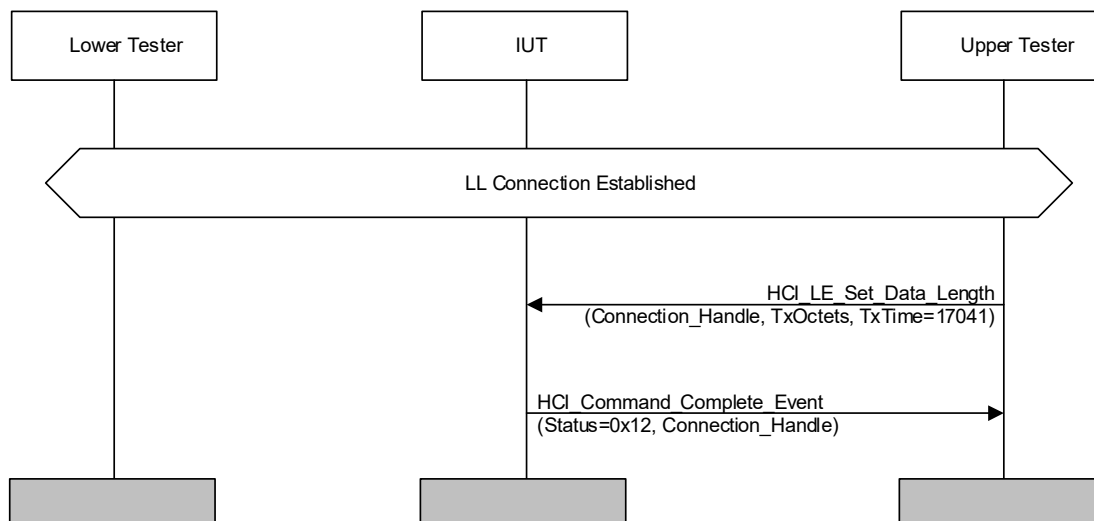


Figure 4.105: HCI/CCO/BI-40-C [LE Set Data Length, Invalid Parameters] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command_Complete event from the IUT with Status = 0x12 (Invalid Parameters).

HCI/CCO/BI-42-C [Configure Data Path]

- Test Purpose

Verify that the IUT properly handles the Host sending an invalid Data_Path_ID.

- Reference

[12] 7.3.101

- Initial Condition
 - An invalid Data Path ID between the Host and the Controller is specified in the TSPX_Invalid_Data_Path_ID IXIT value.
 - The IXIT parameters are specified in [Table 4.46](#).

IXIT Parameter	Description
TSPX_Invalid_Data_Path_ID	An Invalid Data Path ID

Table 4.46: Configure Data Path IXIT parameters

- Test Procedure
 - The Upper Tester sends an HCI_Configure_Data_Path command to the IUT with Data_Path_ID set to TSPX_Invalid_Data_Path_ID, Data_Path_Direction set to 0x00, and any Vendor_Specific_Config_Length and Vendor_Specific_Config.
 - The IUT sends an HCI_Command_Complete event to the Upper Tester with error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 2, the Upper Tester receives an HCI_Command_Complete event with error code Invalid HCI Command Parameters (0x12).

HCI/CCO/BI-43-C [LE Read Channel Map – Reject Invalid Handle]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an invalid ACL handle for LE Read Channel Map HCI command.
- Reference

[\[13\]](#) 7.8.20
- Initial Condition
 - An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
 - The IUT acts in Peripheral or Central role.
- Test Procedure
 - The Upper Tester issues an HCI_LE_Read_Channel_Map command to the IUT with the Connection_Handle parameter set to a different value than the established connection's handle.
 - The IUT sends the HCI_Command_Complete event with the Status = Unknown Connection Identifier (0x02) to the Upper Tester.

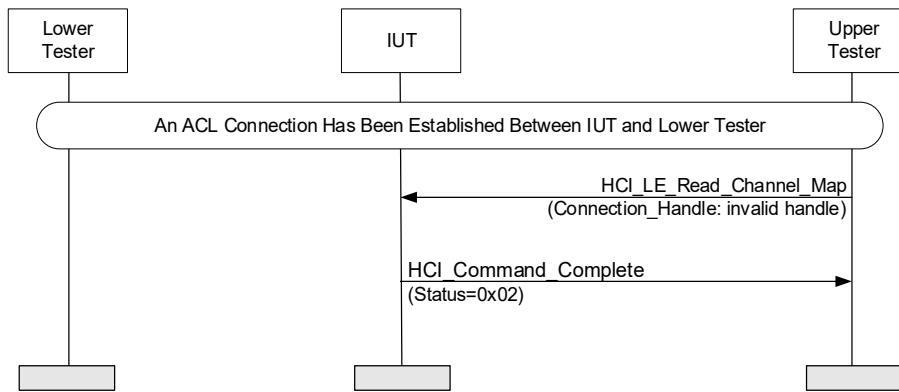


Figure 4.106: HCI/CCO/BI-43-C [LE Read Channel Map – Reject Invalid Handle] MSC

- Expected Outcome

Pass verdict

In Step 2, the IUT returns the Status = Unknown Connection Identifier (0x02) to the Upper Tester.

4.10.8 Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller

- Test Purpose

Verify that the IUT properly rejects the Upper Tester setting a Host Controlled FeatureSet bit for a feature not supported on the Controller.

- Reference

[12] 7.8.115

[13] 4.6

- Initial Condition

- The FeatureSet Bit in Table 4.47 is clear.
- The IUT is not connected to the Lower Tester.

- Test Case Configuration

Test Case	FeatureSet Bit
HCI/CCO/BI-44-C	32 (Connected Isochronous Streams (Host Support))
HCI/CCO/BI-45-C	38 (Connection Subrating (Host Support))
HCI/CCO/BI-121-C	41 (Advertising Coding Selection (Host Support))
HCI/CCO/BI-122-C	47 (Channel Sounding (Host Support))
HCI/CCO/BI-133-C	72 (Shorter Connection Intervals (Host Support))

Table 4.47: Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller test cases

- Test Procedure

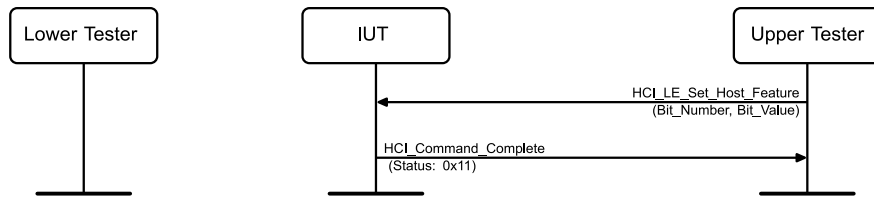


Figure 4.107: Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller MSC

1. The Upper Tester sends the HCI_LE_Set_Host_Feature command to the IUT with Bit_Number set to the FeatureSet Bit in Table 4.47 and Bit_Value set to 1.
2. The IUT sends the HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter value (0x11).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter value (0x11).

4.10.9 LE Add Device To Resolving List

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an invalid entry for an LE Add Device To Resolving List HCI command.

- Reference

[13] 7.8.38

- Initial Condition

- None.

- Test Case Configuration

Test Case	Parameters	HCI Command (in Step 5)	Expected Status / Result (in Step 6)
HCI/CCO/BI-46-C [LE Add Device To Resolving List – Duplicate Entry]	Peer_Identity_Address_Type, Peer_Identity_Address, Peer_IRK, Local_IRK	No command	N/A
HCI/CCO/BI-47-C [LE Add Device To Resolving List – Existing Peer IRK Entry]	Peer_Identity_Address_Type2, Peer_Identity_Address, Peer_IRK, Local_IRK	HCI_LE_Remove_ Device_From_ Resolving_List	Status = Unknown Connection Identifier (0x02)
HCI/CCO/BI-48-C [LE Add Device To Resolving List – Existing Peer IRK Entry]	Peer_Identity_Address_Type, Peer_Identity_Address2, Peer_IRK, Local_IRK	HCI_LE_Remove_ Device_From_ Resolving_List	Status = Unknown Connection Identifier (0x02)

Table 4.48: LE Add Device To Resolving List test cases

- Test Procedure

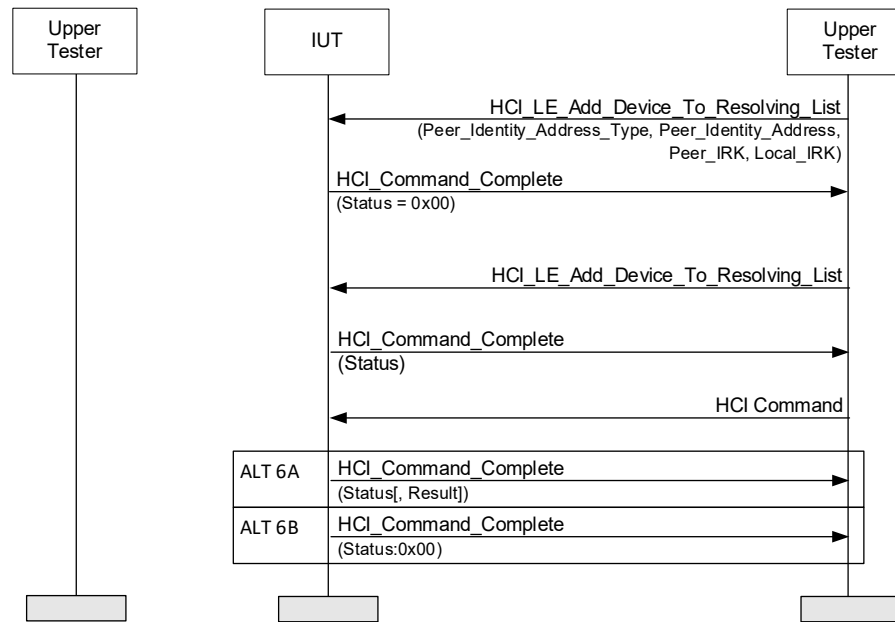


Figure 4.108: LE Add Device To Resolving List MSC

1. The Upper Tester sends an HCI_LE_Add_Device_To_Resolving_List command to the IUT with a valid peer device identity.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success").
3. Repeat Step 1, with parameters as listed in [Table 4.48](#).
4. The IUT sends the HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") or Status set to any valid error code.
5. The Upper Tester sends an HCI command, if specified and as listed in [Table 4.48](#), to the IUT with the corresponding parameters added in Step 4.
6. Perform either alternative 6A or 6B depending on the Status in Step 4.
 - Alternative 6A (The Status is set to any valid error code):
 - 6A.1 The IUT sends an HCI_Command_Complete event to the Upper Tester, with Status (and Result) as listed in [Table 4.48](#).
 - Alternative 6B (The Status is set to 0x00):
 - 6B.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

The entry added in Step 4 is not added to the resolving list, and the Result in Step 6 is as indicated in [Table 4.48](#).

HCI/CCO/BI-50-C [LE Add Device To Resolving List – No Space Available, Scanner]

- Test Purpose

Verify that the scanner IUT properly handles the Upper Tester sending too many entries for an LE Add Device To Resolving List HCI command.

- Reference

[\[13\]](#) 7.8.38



- Initial Condition
 - The scanner IUT is configured in a standby state.
- Test Procedure

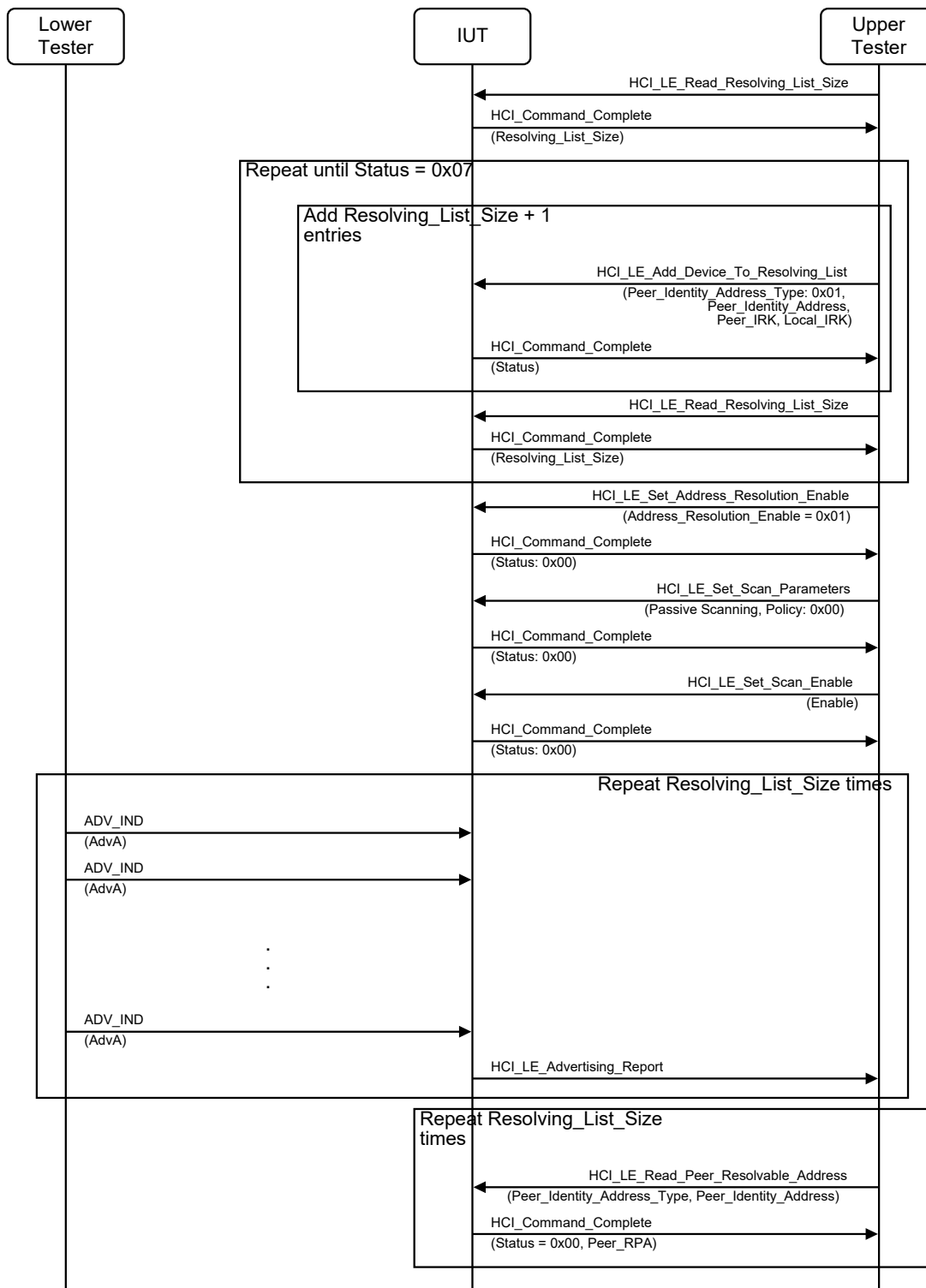


Figure 4.109: HCI/CCO/BI-50-C [LE Add Device To Resolving List – No Space Available] MSC

1. The Upper Tester sends an HCI_LE_Read_Resolving_List_Size command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") and the number of entries in the resolving list.
3. The Upper Tester sends an HCI_LE_Add_Device_To_Resolving_List command to the IUT, with Peer_Identity_Address_Type set to 0x01, Peer_Identity_Address set to a valid peer device identity, and Peer_IRK set to the corresponding IRK.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") or 0x07 ("Memory Capacity Exceeded"), in which case, continue with Step 10.
5. Repeat Steps 3 and 4 with a different address and IRK until it adds (Resolving_List_Size (from Step 2) value + 1) entries, or until the IUT sends to the Upper Tester an HCI_Command_Complete event with Status = 0x07 ("Memory Capacity Exceeded").
6. Repeat Steps 1 and 2.
7. If the number of entries added in the resolving list (Step 3) is lower than the Resolving_List_Size value received in Step 6, repeat from Step 3; this indicates that the controller modified the resolving list size.
8. If the number of entries added in the resolving list (Step 3) is equal to the Resolving_List_Size value received in Step 6 and the IUT doesn't return Status set to 0x07 in Step 5, the test fails and stops.
9. The Upper Tester sends an HCI_LE_Set_Address_Resolution_Enable command to the IUT.
10. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success").
11. The Upper Tester sends an HCI_LE_Set_Scan_Parameters command to the IUT.
12. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success").
13. The Upper Tester sends an HCI_LE_Set_Scan_Enable command to the IUT with the LE_Scan_Enable field set to 0x01.
14. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success").
15. The Lower Tester is configured to send ADV_IND advertising packets with an advertising interval of 50 ms and the AdvA set to a resolvable private address generated using one of the IRKs in Step 3.
16. The Lower Tester advertises for 500 ms or until an HCI_LE_Advertising_Report is sent from the IUT to the Upper Tester with AdvA set to the Identity Address corresponding to the IRK used in Step 15.
17. Repeat Steps 15 and 16 until each of the IRKs in Step 3 has been advertised in Step 15.
18. The Upper Tester sends HCI_LE_Read_Peer_Resolvable_Address commands to the IUT, consecutively requesting all the entries successfully added in Step 3 (Peer_Identity_Address_Type and Peer_Identity_Address parameters are set consecutively to the values used in Step 3).
19. For each of the commands in Step 18, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") and the Peer_Resolvable_Address set to the correct advertised Address used in Step 15 by the Lower Tester corresponding to the IRK set in Step 3.

- Expected Outcome

Pass verdict

When the IUT cannot add any more entries in the resolving list, in Step 5 the IUT sends an HCI_Command_Complete event with Status set to 0x07 ("Memory Capacity Exceeded") to the Upper Tester.

All the resolving list entries that the IUT returns in Step 17 are those added in Step 3 for which the IUT returned Status set to 0x00.

4.10.10 LE Add Device To Resolving List – No Space Available, Advertiser

- Test Purpose

Verify that the advertiser IUT properly handles the Upper Tester sending too many entries for an LE Add Device To Resolving List HCI command.

- Reference

[13] 7.8.38

- Initial Condition

- The advertiser IUT is configured in a standby state.

- Test Case Configuration

Test Case	Advertising Type
HCI/CCO/BI-69-C [LE Add Device To Resolving List – No Space Available, Advertiser, Connectable]	ADV_IND (0x00)
HCI/CCO/BI-70-C [LE Add Device To Resolving List – No Space Available, Advertiser, Non-Connectable]	ADV_SCAN_IND (0x02)

Table 4.49: LE Add Device To Resolving List – No Space Available, Advertiser test cases

- Test Procedure

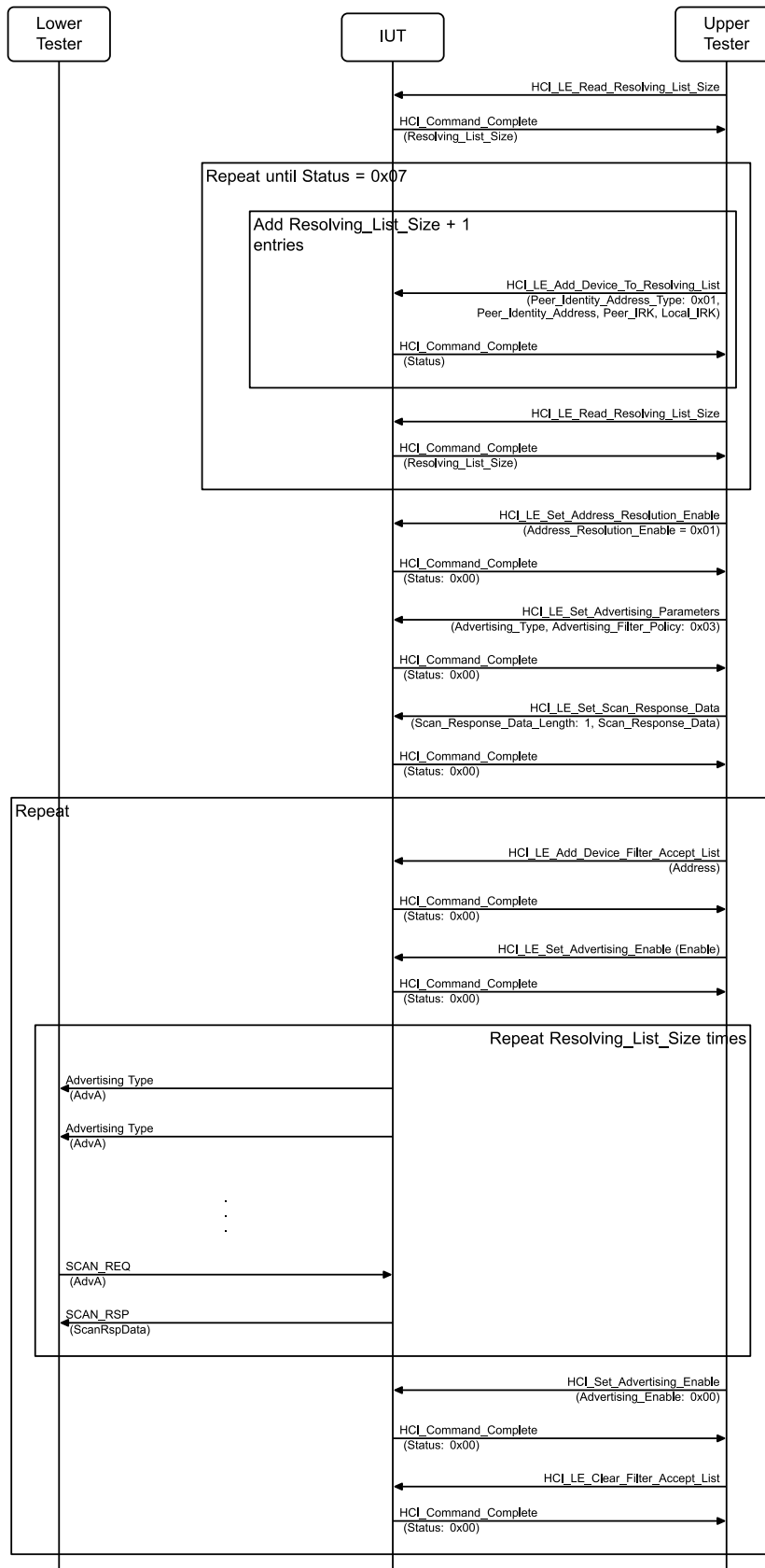


Figure 4.110: LE Add Device To Resolving List – No Space Available, Advertiser MSC

1. The Upper Tester sends an HCI_LE_Read_Resolving_List_Size command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") and the number of entries in the resolving list.
3. The Upper Tester sends an HCI_LE_Add_Device_To_Resolving_List command to the IUT, with Peer_Identity_Address_Type set to 0x01, Peer_Identity_Address set to a valid peer device identity, and Peer_IRK set to the corresponding IRK.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success") or 0x07 ("Memory Capacity Exceeded"), in which case, continue with Step 9.
5. Repeat Steps 3 and 4 with a different address and IRK until it adds (Resolving_List_Size (from Step 2) value + 1) entries, or until the IUT sends to the Upper Tester an HCI_Command_Complete event with Status = 0x07 ("Memory Capacity Exceeded").
6. Repeat Steps 1 and 2.
7. If the number of entries added in the resolving list (Step 3) is less than or equal to the Resolving_List_Size value received in Step 6, repeat from Step 3; this indicates that the controller modified the resolving list size.
8. If the number of entries added in the resolving list (Step 3) is greater than the Resolving_List_Size value received in Step 6 and the IUT doesn't return Status set to 0x07 in Step 5, the test fails and stops.
9. The Upper Tester sends an HCI_LE_Set_Address_Resolution_Enable command to the IUT.
10. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 ("Success").
11. The Upper Tester sends an HCI_LE_Set_Advertising_Parameters command to the IUT with Advertising_Type set as specified in [Table 4.49](#) and Advertising_Filter_Policy set to 0x03 and receives a successful HCI_Command_Complete event in response.
12. The Upper Tester sends an HCI_LE_Set_Scan_Response_Data command to the IUT with Scan_Response_Data_Length set to 1 and Scan_Response_Data set to one random octet and receives a successful HCI_Command_Complete event in response.

Perform Steps 13–19 for each of the IRKs in Step 3.

13. The Upper Tester sends an HCI_LE_Add_Device_To_Filter_Accept_List command to the IUT with Address set to the peer address corresponding to the IRK and receives a successful HCI_Command_Complete event in response.
14. The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT enabling advertising and receives a successful HCI_Command_Complete event in response.
15. The IUT starts sending the advertising type PDUs specified in [Table 4.49](#) to the Lower Tester.
16. The Lower Tester sends a SCAN_REQ PDU to the IUT with AdvA set to a resolvable private address generated using the IRK.
17. The IUT sends a SCAN_RSP PDU to the Lower Tester with ScanRspData set to the advertising data from Step 12.
18. The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT disabling advertising and receives a successful HCI_Command_Complete event in response.
19. The Upper Tester sends an HCI_LE_Clear_Filter_Accept_List command and receives a successful HCI_Command_Complete event in response.

- Expected Outcome

Pass verdict

When the IUT cannot add any more entries in the resolving list, in Step 5 the IUT sends an HCI_Command_Complete event with Status set to 0x07 ("Memory Capacity Exceeded") to the Upper Tester.

In Step 17, the IUT sends a SCAN_RSP PDU in response to Step 16 for each of the IRKs in Step 3.



4.10.11 Reject Invalid Create Connection Command

- Test Purpose

Verify that the IUT properly rejects a create connection command when the LE Random Device Address is unset, and it returns the expected error code.

- Initial Condition

- The IUT is in Initiating State.
- The IUT has not set its LE Random Device Address.

- Test Case Configuration

Test Case	Own_Address_Type	Initiator_Filter_Policy
HCI/CCO/BI-51-C	0x01	NA
HCI/CCO/BI-52-C	0x03	0x00
HCI/CCO/BI-53-C	0x03	0x01

Table 4.50: Reject Invalid Create Connection Command test cases

- Test Procedure

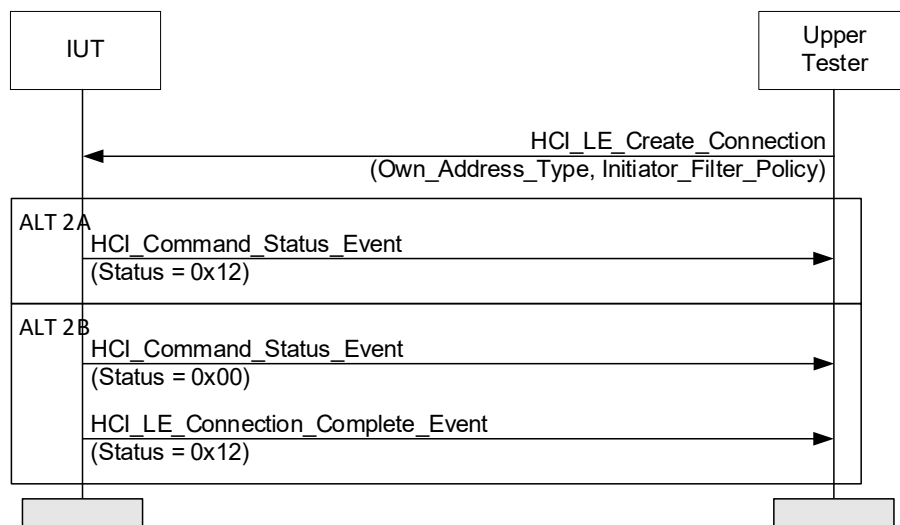


Figure 4.111: Reject Invalid Create Connection Command MSC

- The Upper Tester sends an HCI_LE_Create_Connection command to the IUT with Own_Address_Type and Initiator_Filter_Policy set to the values in [Table 4.50](#). Set all other fields to valid values.
- Perform either alternative 2A or 2B depending on the HCI_Command_Status event response.
 - Alternative 2A (The IUT returns an HCI_Command_Status event with an error code):
 - The IUT returns an HCI_Command_Status event with the error code Invalid HCI Command Parameters (0x12).
 - Alternative 2B (The IUT returns a successful HCI_Command_Status event):
 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester with the error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 2A.1, the IUT sends an HCI_Command_Status event to the Upper Tester with a status of Invalid HCI Command Parameters (0x12).

In Step 2B.2, the IUT sends an HCI_LE_Connection_Complete event to the Upper Tester with a status of Invalid HCI Command Parameters (0x12).

4.10.12 Reject Invalid Extended Create Connection Command

- Test Purpose

Verify that the IUT properly rejects an extended create connection command when the LE Random Device Address is unset, and it returns the expected error code.

- Initial Condition

- The IUT is in Initiating State.
- The IUT has not set its LE Random Device Address.

- Test Case Configuration

Test Case	Own_Address_Type	Initiator_Filter_Policy
HCI/CCO/BI-54-C	0x01	NA
HCI/CCO/BI-55-C	0x03	0x00
HCI/CCO/BI-56-C	0x03	0x01

Table 4.51: Reject Invalid Extended Create Connection Command test cases

- Test Procedure

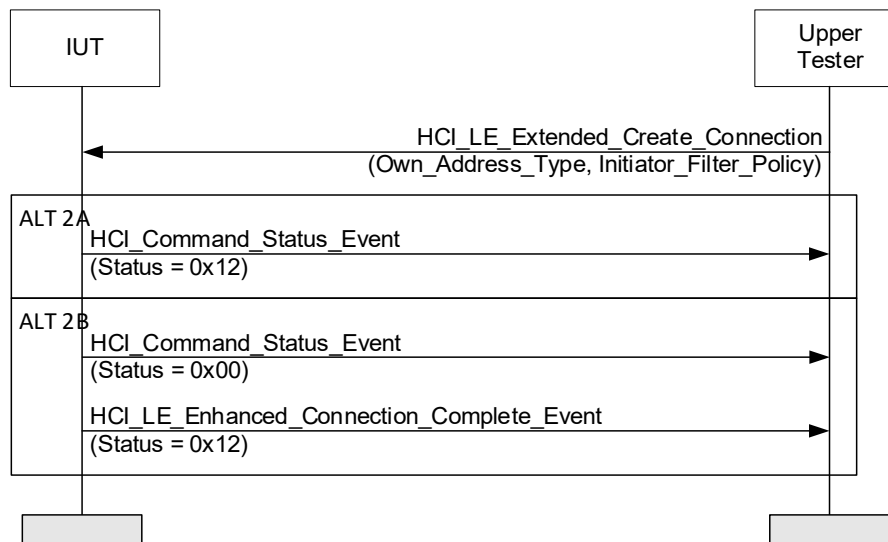


Figure 4.112: Reject Invalid Extended Create Connection Command MSC

1. The Upper Tester sends an HCI_LE_Extended_Create_Connection command to the IUT with Own_Address_Type and Initiator_Filter_Policy set to the values in [Table 4.51](#). Set all other fields to valid values.
 2. Perform either alternative 2A or 2B depending on the HCI_Command_Status event response.
 - Alternative 2A (The IUT returns an HCI_Command_Status event with an error code):
 - 2A.1 The IUT returns an HCI_Command_Status event with the error code Invalid HCI Command Parameters (0x12).
 - Alternative 2B (The IUT returns a successful HCI_Command_Status event):
 - 2B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2B.2 The IUT sends an HCI_LE_Enhanced_Connection_Complete event to the Upper Tester with the error code Invalid HCI Command Parameters (0x12).
- Expected Outcome

Pass verdict

In Step 2A.1, the IUT sends an HCI_Command_Status event to the Upper Tester with a status of Invalid HCI Command Parameters (0x12).

In Step 2B.2, the IUT sends an HCI_LE_Connection_Complete event to the Upper Tester with a status of Invalid HCI Command Parameters (0x12).

4.10.13 LE Setup ISO Data Path

- Test Purpose

Verify that the IUT properly handles when the Host sends the LE_Setup_ISO_Data_Path command twice before sending the LE_Remove_ISO_Data_Path command. Also verify that the IUT properly handles invalid Host parameters for Codec_Configuration_Length and Codec_ID.

- Reference

[\[12\]](#) 7.8.109

- Initial Condition

CIS

- A CIS has been established using the values specified in [\[14\]](#) Section 4.11.2, Default Values for Common Parameters.

BIS Isochronous Broadcaster

- The Isochronous Broadcaster IUT has created a BIS with the Lower Tester synchronized to the BIS.
- The IXIT parameters are specified in [Table 4.52](#).

BIS Synchronized Receiver

- The Synchronized Receiver IUT is synchronized with the Lower Tester broadcasting a BIS.
- The IXIT parameters are specified in [Table 4.52](#).

IXIT Parameter	Description
TSPX_Data_Path_ID_CIS	CIS Data Path ID
TSPX_Data_Path_ID_BIS_Broadcaster	BIS Broadcaster Data Path ID
TSPX_Data_Path_ID_BIS_Receiver	BIS Receiver Data Path ID
TSPX_Number_Supported_Standard_Codecs_BR_EDR	Number of Standard Codecs, BR/EDR



IXIT Parameter	Description
TSPX_Number_Supported_Standard_Codecs_All_PHYs	Number of Standard Codecs, All PHYs
TSPX_Number_Supported_Vendor_Codecs_BR_EDR	Number of Vendor Specific Codecs, BR/EDR
TSPX_Number_Supported_Vendor_Codecs_All_PHYs	Number of Vendor Specific Codecs, All PHYs
TSPX_Codec_ID_CIS	CIS Codec ID
TSPX_Codec_ID_BIS_Broadcaster	BIS Broadcaster Codec ID
TSPX_Codec_ID_BIS_Receiver	BIS Receiver Codec ID
TSPX_Direction	Direction
TSPX_Codec_Configuration_CIS	CIS Codec Configuration
TSPX_Codec_Configuration_BIS_Broadcaster	BIS Broadcaster Codec Configuration
TSPX_Codec_Configuration_BIS_Receiver	BIS Receiver Codec Configuration
TSPX_Data_Path_Configuration	Vendor-specific data path configuration

Table 4.52: LE Setup ISO Data Path IXIT Parameters

- Test Case Configuration

Test Case	HCI/CCO/BI-57-C [LE Setup ISO Data Path, CIS]	HCI/CCO/BI-58-C [LE Setup ISO Data Path, BIS, Isochronous Broadcaster]	HCI/CCO/BI-62-C [LE Setup ISO Data Path, BIS, Synchronized Receiver]
ISOC Stream Type	CIS	BIS Isochronous Broadcaster	BIS Synchronized Receiver
Perform Steps 4 and 5	Yes	Yes	No
Perform Steps 6 and 7	Yes	No	Yes
Codec_ID	TSPX_Codec_ID_CIS	TSPX_Codec_ID_BIS_Broadcaster	TSPX_Codec_ID_BIS_Receiver
Direction	TSPX_Direction	0	1
Logical_Transport_Type	0x02 (LE CIS)	0x03 (LE BIS)	0x03 (LE BIS)
Codec_Configuration	TSPX_Codec_Configuration_CIS	TSPX_Codec_Configuration_BIS_Broadcaster	TSPX_Codec_Configuration_BIS_Receiver
Data_Path_ID	TSPX_Data_Path_ID_CIS	TSPX_Data_Path_ID_BIS_Broadcaster	TSPX_Data_Path_ID_BIS_Receiver

Table 4.53: LE Setup ISO Data Path test cases

- Test Procedure

1. The Upper Tester sends the HCI_Read_Local_Supported_Codecs [v2] command to the IUT.
2. The IUT responds with a successful HCI_Command_Complete event.
3. The Lower Tester verifies that the returned value of Num_Supported_Standard_Codecs equals TSPX_Number_Supported_Standard_Codecs_All_PHYs, and the returned value of Num_Supported_Vendor_Specific_Codecs equals TSPX_Number_Supported_Vendor_Codecs_All_PHYs. The Lower Tester also verifies that one

of the supported codecs (either standard or vendor-specific) has the Codec_ID and Logical_Transport_Type specified in [Table 4.53](#).

Perform Steps 4 and 5 if specified in [Table 4.53](#).

4. The Upper Tester sends an HCI_Read_Local_Supported_Codec_Capabilities command to the IUT with Codec_ID and Logical_Transport_Type specified in [Table 4.53](#), and Direction set to 0x00.
5. The IUT either sends a successful HCI_Command_Complete event with Num_Codec_Capabilities, Codec_Capability_Length, and Codec_Capability or sends an HCI_Command_Complete event with Status > 0x00.

Perform Steps 6 and 7 if specified in [Table 4.53](#).

6. The Upper Tester sends an HCI_Read_Local_Supported_Codec_Capabilities command to the IUT with Codec_ID and Logical_Transport_Type specified in [Table 4.53](#), and Direction set to 0x01.
7. The IUT either sends a successful HCI_Command_Complete event with Num_Codec_Capabilities, Codec_Capability_Length, and Codec_Capability or sends an HCI_Command_Complete event with Status > 0x00.
8. If both Steps 5 and 7 returned an error, or if only one of these steps was performed and returned an error, then the test ends with a Fail verdict. Otherwise, if either Step 5 or 7 was not run, returned an error, or succeeded and returned Num_Codec_Capabilities = 0, then the test ends with a Pass verdict.
9. The Upper Tester sends an HCI_Read_Local_Supported_Controller_Delay command to the IUT with Codec_ID, Logical_Transport_Type, Direction, and Codec_Configuration set as specified in [Table 4.53](#), and Codec_Configuration_Length set to the length of Codec_Configuration.
10. The IUT responds with a successful HCI_Command_Complete event with Min_Controller_Delay and Max_Controller_Delay set to a value between 0x000000 and 0x3D0900 and $\text{Max_Controller_Delay} \geq \text{Min_Controller_Delay}$.
11. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Data_Path_Direction, Codec_ID, Codec_Configuration_Length, and Codec_Configuration parameters set to the values used in Step 9, Controller_Delay set to the mean of Min_Controller_Delay and Max_Controller_Delay returned in Step 10, and Data_Path_ID set as specified in [Table 4.53](#).
12. If the Data_Path_ID is zero, then the IUT responds with a successful HCI_Command_Complete event, and skip Steps 13 and 14. Otherwise, the IUT sends an HCI_Command_Complete event to the Upper Tester with a Command Disallowed (0x0C) error code.
13. The Upper Tester sends an HCI_Configure_Data_Path command to the IUT with Data_Path_Direction and Data_Path_ID set as specified in [Table 4.53](#) and Vendor_Specific_Config_Length and Vendor_Specific_Config set to the length and value of TSPX_Data_Path_Configuration (the length may be zero if there is no configuration required) and receives a successful HCI_Command_Complete in return.
14. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Data_Path_Direction, and Data_Path_ID, Codec_ID, Controller_Delay, Codec_Configuration_Length, and Codec_Configuration parameters set to the values used in Step 11, and the IUT responds with a successful HCI_Command_Complete event.
15. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Data_Path_Direction, and Data_Path_ID, Codec_ID, Controller_Delay, Codec_Configuration_Length, and Codec_Configuration parameters set to the values used in Step 11, and the IUT responds with an HCI_Command_Complete event with error code Command Disallowed (0x0C).

16. The Upper Tester sends an HCI_LE_Remove_ISO_Data_Path command to the IUT with an invalid connection handle, and the IUT responds with error code Unknown Connection Identifier (0x02).
17. The Upper Tester sends an HCI_LE_Remove_ISO_Data_Path command to the IUT with the Data_Path_Direction parameter the same as in Step 11, and the IUT responds with a successful HCI_Command_Complete event.
18. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Codec_Configuration_Length > 0 and Codec_ID set to Transparent Air mode, the remaining parameters set to the values used in Step 11, and the IUT responds with an HCI_Command_Complete event with error code Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 12, the IUT sends an HCI_Command_Complete event to the Upper Tester with error code Command Disallowed (0x0C) if TSPX_Data_Path_ID is not zero.

In Step 14, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

In Step 16, the IUT sends an HCI_Command_Complete event to the Upper Tester with error code Unknown Connection Identifier (0x02).

In Step 15, the IUT sends an HCI_Command_Complete event to the Upper Tester with error code Command Disallowed (0x0C).

In Step 18, the IUT sends an HCI_Command_Complete event to the Upper Tester with error code Invalid HCI Command Parameters (0x12).

HCI/CCO/BI-59-C [Invalid LE Set Periodic Advertising Receive Enable Parameters, Periodic Advertising ADI Not Supported]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for LE Set Periodic Advertising Receive Enable related HCI commands when Periodic Advertising ADI is not supported.

- Reference

[\[13\]](#) 7.8.88

- Initial Condition

- The IUT is in standby. Extended advertising parameters and periodic advertising parameters have been configured on the IUT for a particular advertising handle.
- The IUT has synced to the Lower Tester Periodic Advertising.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Receive_Enable command to the IUT with the Enable bits 0 and 1 set to 1.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with an error code.

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an HCI_Command_Complete event with Status set to an error code.

4.10.14 Invalid LE Set Periodic Advertising Sync Transfer Parameters, Periodic Advertising ADI Not Supported

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending invalid parameters for the LE Set Periodic Advertising Sync Transfer Parameters or LE Set Default Periodic Advertising Sync Transfer Parameters command when Periodic Advertising ADI is not supported.

- Reference

[13] 7.8.91, 7.8.92

- Initial Condition

- State: Connected
- Extended advertising parameters and periodic advertising parameters have been configured on the IUT.

- Test Case Configuration

Test Case	HCI Command
HCI/CCO/BI-60-C [Invalid LE Set PAST Parameters, PA ADI Not Supported]	HCI_LE_Set_Periodic_Advertising_Sync_Transfer_Parameters
HCI/CCO/BI-61-C [Invalid LE Set Default PAST Parameters, PA ADI Not Supported]	HCI_LE_Set_Default_Periodic_Advertising_Sync_Transfer_Parameters

Table 4.54: Invalid LE Set Periodic Advertising Sync Transfer Parameters, Periodic Advertising ADI Not Supported test cases

- Test Procedure

- The Upper Tester sends the HCI command as specified in Table 4.54 to the IUT with Mode set to 0x03 and all other parameters set to valid values.
- The IUT sends an HCI_Command_Complete event to the Upper Tester with an error code.

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an HCI_Command_Complete event with Status set to an error code.

HCI/CCO/BI-63-C [LE Extended Create Connection [v2], Invalid Parameters]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Extended Create Connection [v2] command.

- Reference

[17] 7.8.66

- Initial Condition

- The IUT enables Periodic Advertising with Responses using Advertising Handle = 0x00.

- Test Procedure

Repeat Steps 1–2 for each round in [Table 4.55](#).

1. The Upper Tester sends the HCI_LE_Extended_Create_Connection [v2] command with the parameters specified in [Table 4.55](#).
2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set as specified in [Table 4.55](#).

Round	Parameter	Status
1	Advertising_Handle = 0x01	Unknown Advertising Identifier (0x42)
2	Subevent = 0x80	Invalid HCI Command Parameters (0x12)
3	Advertising_Handle = 0xFF Subevent = 1	Invalid HCI Command Parameters (0x12)
4	Min_CE_Length > Max_CE_Length	Invalid HCI Command Parameters (0x12)

Table 4.55: LE Extended Create Connection [v2], Invalid Parameters test rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Status event with the error specified in [Table 4.55](#).

4.10.15 LE Set Periodic Advertising Parameters, Invalid Parameters

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Set Periodic Advertising Parameters [v2] command.

- Reference

[\[17\]](#) 7.8.61

- Initial Condition

- There is a valid advertising set configured on the IUT.

- Test Case Configuration

Test Case	HCI Command	Rounds
HCI/CCO/BI-64-C	HCI_LE_Set_Periodic_Advertising_Parameters [v1]	1–2
HCI/CCO/BI-65-C	HCI_LE_Set_Periodic_Advertising_Parameters [v2]	All

Table 4.56: LE Set Periodic Advertising Parameters, Invalid Parameters test cases

- Test Procedure

Repeat the steps specified in [Table 4.56](#) for each round in [Table 4.57](#).

1. The Upper Tester sends the HCI command specified in [Table 4.56](#) with the parameters specified in [Table 4.57](#).
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.57](#).

Round	Parameter	Status
1	Advertising_Handle = set to unknown handle, all others set to valid values	Unknown Advertising Identifier (0x42)
2	Periodic_Advertising_Interval_Min > Periodic_Advertising_Interval_Max, all others set to valid values	Invalid HCI Command Parameters (0x12)
3	Subevent_Interval > Periodic_Advertising_Interval_Min / Num_Subevents, all others set to valid values	Invalid HCI Command Parameters (0x12)
4	Response_Slot_Delay >= Subevent_Interval, all others set to valid values	Invalid HCI Command Parameters (0x12)
5	Response_Slot_Delay = 0x00 Num_Response_Slots > 0, all others set to valid values	Invalid HCI Command Parameters (0x12)
6	Response_Slot_Spacing > 10x(Subevent_Interval – Response_Slot_Delay) / Num_Response_Slots, all others set to valid values	Invalid HCI Command Parameters (0x12)
7	Num_Subevents > 0x80, all others set to valid values	Invalid HCI Command Parameters (0x12)
8	Num_Subevents > 1, Subevent_Interval < 0x06, all others set to valid values	Invalid HCI Command Parameters (0x12)
9	Response_Slot_Delay = 0xFF, all others set to valid values	Invalid HCI Command Parameters (0x12)
10	Response_Slot_Spacing = 0x01, all others set to valid values	Invalid HCI Command Parameters (0x12)
11	Num_Response_Slots = 0, all others set to valid values	Invalid HCI Command Parameters (0x12)
12	Subevent_Interval = 24 (30 ms) Response_Slot_Delay = 12 (15 ms) Num_Response_Slots = 5 Response_Slot_Spacing = 25 (3.125 ms)	Invalid HCI Command Parameters (0x12)
13	Num_Subevents = 0 Subevent_Interval = 0x05 Response_Slot_Delay = 0xFF Response_Slot_Spacing = 0x01 Num_Response_Slots = 0x00	Success (0x00)
14	Num_Subevents = 1, Subevent_Interval < 0x06, all others set to valid values	Success (0x00)

Table 4.57: LE Set Periodic Advertising Parameters, Invalid Parameters test rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with the error specified in [Table 4.57](#).

HCI/CCO/BI-66-C [LE Set Periodic Advertising Response Data, Invalid Parameters]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Set Periodic Advertising Response Data command.

- Reference

[17] 7.8.126

- Initial Condition

- The IUT is scanning for Periodic Advertising and is synchronized with the Lower Tester periodic advertising with response.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Periodic_Sync_Subevent to the IUT with Subevent set to 0.

Repeat Steps 2–4 for each round in [Table 4.58](#).

2. The IUT sends an HCI_LE_Periodic_Advertising_Report [v2] event to the Upper Tester with Subevent set to 0x00.
3. The Upper Tester sends the HCI_LE_Set_Periodic_Advertising_Response_Data command with the parameters specified in [Table 4.58](#).
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.58](#).
5. The Upper Tester sends an HCI_LE_Periodic_Advertising_Terminate_Sync command to the IUT and receives a successful HCI_Command_Complete event in response.

Round	Parameter	Status
1	Sync_Handle > 0x0EFF, all others set to valid values	Invalid HCI Command Parameters (0x12)
2	Response_Data_Length > max that controller can transmit	Packet Too Long (0x45)
3	Response_Slot has passed by the time this command is received by the Controller	TooLate (0x46)
4	Response_Data_Length = 255, Response_Data truncated to 247 bytes, all others set to valid values	Invalid HCI Command Parameters (0x12)
5	Response_Subevent set to 5 (above numSubevents), all others set to valid values	Command Disallowed (0x0C)
6	Response_Subevent set to 2 (subevent not synced), all others set to valid values	Command Disallowed (0x0C)

Table 4.58: LE Set Periodic Advertising Response Data, Invalid Parameters test rounds

- Expected Outcome

Pass verdict

In Step 4, the IUT sends an HCI_Command_Complete event with the error specified in [Table 4.58](#).

4.10.15.1 LE Set Periodic Advertising Subevent Data, Invalid Parameters

- **Test Purpose**
Verify that the IUT properly handles the Host sending invalid parameters for the LE Set Periodic Advertising Subevent Data command.
- **Reference**
[\[17\]](#) 7.8.125
- **Initial Condition**
 - The IUT is in standby mode.
- **Test Case Configuration**

Test Case	Execute Step 3
HCI/CCO/BI-67-C [LE Set Periodic Advertising Subevent Data, Invalid Parameters, v5.4 or earlier]	No
HCI/CCO/BI-124-C [LE Set Periodic Advertising Subevent Data, Invalid Parameters, v6.0 or later]	Yes

Table 4.59: LE Set Periodic Advertising Subevent Data, Invalid Parameters test cases

- **Test Procedure**
 1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT using all supported advertising channels and a selected advertising interval between the minimum and maximum advertising intervals supported and receives a successful HCI_Command_Complete event in return. The Advertising_Event_Properties parameter is set to 0x0000, Primary_Advertising_PHY is set to 0x01 (LE 1M), and Secondary_Advertising_PHY is set to 0x01 (LE 1M).
 2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Parameters [v2] command to the IUT with Num_Subevents_With_Data set to 10, Subevent_Interval set to 0xFF (318.75 ms), Response_Slot_Delay set to 0x01 (1.25 ms), Response_Slot_Spacing set to 0x0A (1.25 ms), and Num_Response_Slots set to 0x05, and receives a successful HCI_Command_Complete event in response.
 3. Execute Step 3 if specified in [Table 4.59](#).
 - 3a. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Subevent_Data_Length set to 1.
 - 3b. The IUT sends an HCI_Command_Complete event with Status > 0.
 4. The Upper Tester enables periodic advertising with Periodic Advertising Filtering using the HCI_LE_Set_Periodic_Advertising_Enable command with bit 0 (Enable periodic advertising) and receives an HCI_Command_Complete event in response.
 5. The Upper Tester enables advertising using the HCI_LE_Set_Extended_Advertising_Enable command with the Duration[0] parameter set to 0x0000 (No Advertising Duration), and receives an HCI_Command_Complete event in response.

Repeat Steps 6–8 for each round in [Table 4.60](#). In round 10, repeat Step 6 until Subevent_Data_Count is greater than 1. If this doesn't happen within 10 periodic advertising events, then skip round 10.

 6. The IUT sends an HCI_LE_Periodic_Advertising_Subevent_Data_Request event to the Upper Tester with Subevent_Start and Subevent_Data_Count.

7. The Upper Tester sends the HCI_LE_Set_Periodic_Advertising_Subevent_Data command with the parameters specified in [Table 4.60](#).
8. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.60](#).
9. The IUT sends an HCI_LE_Periodic_Advertising_Subevent_Data_Request event to the Upper Tester with Subevent_Start and Subevent_Data_Count.
10. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Num_Subevents_With_Data set to 1 and Subevent set to Subevent_Start from Step 9.
11. The IUT sends a successful HCI_Command_Complete event to the IUT.
12. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Subevent_Data command to the IUT with Num_Subevents_With_Data set to 1 and Subevent set to Subevent_Start from Step 9.
13. The IUT sends an HCI_Command_Complete event to the IUT with Status > 0.

Round	Parameter	Status
1	Advertising_Handle = set to unknown handle, all others set to valid values	Unknown Advertising Identifier (0x42)
2	Advertising_Handle > 0xEF, all others set to valid values	Invalid HCI Command Parameters (0x12)
3	Subevent_Data > max that controller can transmit	Packet Too Long (0x45)
4	Num_Subevents_With_Data = 0x00, all others set to valid values	Invalid HCI Command Parameters (0x12)
5	Num_Subevents_With_Data > 0x0F, all others set to valid values	Invalid HCI Command Parameters (0x12)
6	Subevent[0] > 0x7F, all others set to valid values	Invalid HCI Command Parameters (0x12)
7	Subevent[0] < Subevent_Start (Step 6) OR (Subevent_Start + Subevent_Data_Count) < Subevent[0] < 0x7F, all others set to valid values	Command Disallowed (0x0C)
8	Subevent_Data_Length[0] = 255, all others set to valid values Note: The data is too long to fit in a packet, so the data is truncated.	Invalid HCI Command Parameters (0x12)
9	Response_Slot_Start[0] = 6	Invalid HCI Command Parameters (0x12)
10	Num_Subevents_With_Data = 2 Subevent[0] = Subevent_Start Subevent[1] = Subevent_Start Subevent_Data_Length[0] = 1 Subevent_Data[0] = 0x01 Subevent_Data_Length[1] = 1 Subevent_Data[1] = 0x01	Invalid HCI Command Parameters (0x12)

Table 4.60: LE Set Periodic Advertising Subevent Data, Invalid Parameters test rounds

- Expected Outcome

Pass verdict

In Step 3b, the IUT sends an HCI_Command_Complete event with an error code.

In Step 8, the IUT sends an HCI_Command_Complete event with the error specified in [Table 4.60](#).

In Step 13, the IUT sends an HCI_Command_Complete event with an error code.



HCI/CCO/BI-68-C [LE Set Periodic Sync Subevent, Invalid Parameters]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Set Periodic Sync Subevent command.

- Reference

[17] 7.8.127

- Initial Condition

- The IUT is scanning for Periodic Advertising and is synchronized with the Lower Tester.

- Test Procedure

Repeat Steps 1–2 for each round in [Table 4.61](#).

1. The Upper Tester sends the HCI_LE_Set_Periodic_Sync_Subevent command with the parameters specified in [Table 4.61](#).
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.61](#).

Round	Parameter	Event and Status/Error Code
1	Sync_Handle > 0x0EFF, all others set to valid values	Invalid HCI Command Parameters (0x12)
2	Num_Subevents_To_Sync = 0x00, all others set to valid values	Invalid HCI Command Parameters (0x12)
3	Num_Subevents_To_Sync > 0x80, all others set to valid values	Invalid HCI Command Parameters (0x12)
4	Num_Subevents_To_Sync > Number of Subevent from HCI_LE_Periodic_Advertising_Sync_Established [v2]	Invalid HCI Command Parameters (0x12)
5	Subevent[0] > 0x7F, all others set to valid values	Invalid HCI Command Parameters (0x12)

Table 4.61: LE Set Periodic Sync Subevent, Invalid Parameters test rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with the error specified in [Table 4.61](#).

HCI/CCO/BV-24-C [LE Monitoring Advertisers RSSI command, Memory Capacity Exceeded]

- Test Purpose

Verify that the IUT does not add to the Monitored Advertisers List when Memory Capacity is Exceeded.

- Reference

[18] 7.8.146, 7.8.150

- Test Procedure
 1. The Upper Tester sends HCI_LE_Add_Device_To_Monitored_Advertisers_List commands to the IUT with valid parameters and different addresses and receives a successful HCI_Command_Complete event in response.
 2. Repeat Step 1 until the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x07 (Memory Capacity Exceeded).
 3. The Upper Tester sends an HCI_LE_Read_Monitored_Advertisers_List_Size command to the IUT with no command parameters.
 4. The IUT sends a successful HCI_Command_Complete event to the Upper Tester with Number set to a valid value.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with the error code 0x07 (Memory Capacity Exceeded).

In Step 4, the IUT sends an HCI_Command_Complete event with a valid Number value.

HCI/CCO/BI-71-C [Invalid LE Monitoring Advertisers Parameters]

- Test Purpose

Verify that the IUT handles the Upper Tester sending invalid parameters for LE Monitoring Advertisers related HCI commands.

- Reference

[18] 7.8.146, 7.8.147, 7.8.149

- Test Procedure

1. The Upper Tester sends the HCI Command, with the Parameter and Value/Condition as specified in [Table 4.62](#), to the IUT. All other values for the command are set to valid values.
2. The IUT sends the Event and Status/Error Code as specified in [Table 4.62](#) to the Upper Tester.

Round	Command	Parameter	Value/Condition	Event and Status/Error Code
1	HCI_LE_Add_Device_To_Monitored_Advertisers_List	Address_Type	0x02	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
2	HCI_LE_Add_Device_To_Monitored_Advertisers_List	RSSI_Low_Threshold	21 dBm	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
3	HCI_LE_Add_Device_To_Monitored_Advertisers_List	RSSI_High_Threshold	21 dBm	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
4	HCI_LE_Add_Device_To_Monitored_Advertisers_List	RSSI_High_Threshold	<RSSI_Low_Threshold	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
5	HCI_LE_Add_Device_To_Monitored_Advertisers_List	Timeout	0x00	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
6	HCI_LE_Remove_Device_From_Monitored_Advertisers_List	Address_Type	0x02	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)

Round	Command	Parameter	Value/ Condition	Event and Status/Error Code
7	HCI_LE_Remove_ Device_From_ Monitored_ Advertisers_List	Address	Any valid address with the Monitoring List empty	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)
8	HCI_LE_Enable_ Monitoring_Advertisers	Enable	0x02	HCI_Command_Complete: Invalid HCI Command Parameters (0x12)

Table 4.62: Invalid LE Monitoring Advertisers Parameters rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with the error code 0x12 (Invalid HCI Parameters).

HCI/CCO/BI-72-C [Reject LE Extended Create Connection with Invalid Initiator_Filter_Policy Parameters]

- Test Purpose

Verify that the IUT rejects the LE Extended Create Connection command when the controller does not support Decision Based Advertising Filtering.

- Reference

[18] 7.8.66

- Initial Condition

- The IUT is not currently scanning.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Extended_Create_Connection command to the IUT with the Initiator_Filter_Policy set to a value other than 0x00 or 0x01.
2. The IUT sends an HCI_Command_Complete event with Status set to Unsupported Feature or Parameter Value (0x11).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11).

HCI/CCO/BI-73-C [LE Set Decision Data, Invalid Parameters]

- Test Purpose

Verify that the IUT handles invalid parameters for the LE Set Decision Data command.

- Reference

[18] 7.8.144

- Initial Condition

- The IUT is not currently scanning.

- Test Procedure

Repeat Steps 1 to 3 for each round in [Table 4.63](#).

1. The Upper Tester sends an HCI_LE_Set_Extended_Advertising_Parameters command to the IUT with the Primary_Advertising_PHY set to LE 1M and a valid Advertising_Event_Parameters field with bit 7 set to 1 and receives a successful HCI_Command_Complete in return.
2. The Upper Tester sends the HCI_LE_Set_Decision_Data command to the IUT with the Parameter as set in [Table 4.63](#). Decision_Type_Flags is set to 0x00 unless otherwise specified in [Table 4.63](#).
3. The IUT sends an HCI_Command_Complete event to the Upper Tester with the status specified in [Table 4.63](#).

Round	Parameter	Status
1	Invalid Advertising_Handle	0x42 (Unknown Advertising Identifier)
2	Decision_Data_Length = 5 with Resolvable Tag Type set in Decision_Type_Flags	0x12 (Invalid HCI Command Parameters)
3	Decision_Data_Length = 5	0x00 (Success)
4	Decision_Data_Length = 9	0x12 (Invalid HCI Command Parameters)
5	Decision_Data_Length = 0	0x00 (Success)

Table 4.63: Decision-Based Advertisements, Test Groups rounds

- Expected Outcome

Pass verdict

In Step 3, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.63](#).

HCI/CCO/BI-74-C [LE Set Decision Instructions, Invalid Parameters]

- Test Purpose

Verify that the IUT handles invalid parameters for the LE Set Decision Instructions command.

- Reference

[\[18\]](#) 7.8.145

- Initial Condition

- The maximum number of supported tests in a Decision PDU is defined by the TSPX_max_decision_tests IXIT value.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.64](#). Skip Round 2 if TSPX_max_decision_tests is greater than or equal to 14.

1. The Upper Tester sends an HCI_LE_Set_Decision_Instructions command to the IUT with the Num_Tests field set as specified in [Table 4.64](#).
2. The IUT sends an HCI_Command_Complete event to the Upper Testers as specified in [Table 4.64](#).

Round	Parameter	Status
1	Num_Tests set to 0	0x12 (Invalid HCI Command Parameters)
2	Num_Tests = TSPX_max_decision_tests + 1	0x43 (Limit Reached)
3	Num_Tests = 1 and bit 0 of Test_Flags[0] set to 0	0x12 (Invalid HCI Command Parameters)

Table 4.64: Decision-Based Advertisements, Test Groups rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in Table 4.64.

HCI/CCO/BV-25-C [LE Set Decision Instructions, Support for 8 Tests]

- Test Purpose

Verify that the IUT supports at least eight tests in the decision instructions.

- Reference

[18] 7.8.145

- Test Procedure

- The Upper Tester sends an HCI_LE_Set_Decision_Instructions to the IUT with General_Flags set to 0, Num_Tests set to 8, and Test_Field and Test_Parameters set to 8 valid parameters.
- The IUT sends a successful HCI_Command_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

4.10.16 LE Frame Space Update, PHY Not Supported

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Frame Space Update command when the PHY specified is not supported.

- Reference

[19] 7.7.65.48

- Initial Condition

- LL connection is established, the IUT is Central or Peripheral, and T_IFS = 150 µs

- Test Case Configuration

Test Case	PHY
HCI/CCO/BI-76-C [LE Frame Space Update, PHY Not Supported, LE 2M PHY]	LE 2M
HCI/CCO/BI-77-C [LE Frame Space Update, PHY Not Supported, LE Coded PHY]	LE Coded

Table 4.65: LE Frame Space Update, PHY Not Supported test cases



- Test Procedure
 1. The Upper Tester sends an HCI_LE_Frame_Space_Update command to the IUT with PHYs set as specified in [Table 4.65](#) and all other parameters valid.
 2. Perform either alternative 2A or 2B depending on the IUT HCI_Command_Status response.
 - Alternative 2A (Successful HCI_Command_Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2A.2 The IUT sends an HCI_LE_Frame_Space_Update_Complete event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).
 - Alternative 2B (HCI_Command_Status with an error code):
 - 2B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 2, the IUT rejects the command with an 0x12 error code.

HCI/CCO/BI-78-C [LE Frame Space Update, CIS not supported]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Frame Space Update command when CIS is not supported.
- Reference

[\[17\]](#) 7.7.65.48
- Initial Condition
 - LL connection is established, the IUT is Central or Peripheral, and T_IFS = 150 µs
- Test Procedure
 1. The Upper Tester sends an HCI_LE_Frame_Space_Update command to the IUT with Spacing_Type set to 0x08 and all other parameters valid.
 2. Perform either alternative 2A or 2B depending on the IUT HCI_Command_Status response.
 - Alternative 2A (Successful HCI_Command_Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2A.2 The IUT sends an HCI_LE_Frame_Space_Update_Complete event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).
 - Alternative 2B (HCI_Command_Status with an error code):
 - 2B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).
- Expected Outcome

Pass verdict

In Step 2, the IUT rejects the command with an 0x12 error code.

4.10.17 LE CS Read Local Supported Capabilities

- Test Purpose

Verify that the IUT properly sets the RTT_Capability depending on the RTT support.

- Reference

[19] 7.8.130

- Initial Condition

- The IUT is not currently connected.
- The Channel Sounding (Host Support) feature bit is set.

- Test Case Configuration

Test Case	Parameter	HCI Command Version	Parameter Value	RTT Capability Bit	Bit Value
HCI/CCO/BI-79-C [LE CS Read Local Supported Capabilities, RTT Access Address]	RTT_AA_Only_N	v1	>0	0	0
HCI/CCO/BI-80-C [LE CS Read Local Supported Capabilities, RTT Sounding, Unsupported]	RTT_Sounding_N	v1	0	1	0
HCI/CCO/BI-81-C [LE CS Read Local Supported Capabilities, RTT Random Sequence, Unsupported]	RTT_Random_Sequence_N	v1	0	2	0
HCI/CCO/BI-128-C [LE CS Read Local Supported Capabilities, RTT Access Address, 10 ns]	RTT_AA_Only_N	v1	>0	0	1
HCI/CCO/BI-129-C [LE CS Read Local Supported Capabilities, RTT Sounding, 150 ns]	RTT_Sounding_N	v1	>0	1	0
HCI/CCO/BI-130-C [LE CS Read Local Supported Capabilities, RTT Sounding, 10 ns]	RTT_Sounding_N	v1	>0	1	1
HCI/CCO/BI-131-C [LE CS Read Local Supported Capabilities, RTT Random Sequence, 150 ns]	RTT_Random_Sequence_N	v1	>0	2	0
HCI/CCO/BI-132-C [LE CS Read Local Supported Capabilities, RTT Random Sequence, 10 ns]	RTT_Random_Sequence_N	v1	>0	2	1
HCI/CCO/BI-156-C [LE CS Read Local Supported Capabilities, RTT Access Address, 10 ns, LE 2M PHY]	RTT_2M_AA_Only_N	v2	>0	3	1

Test Case	Parameter	HCI Command Version	Parameter Value	RTT Capability Bit	Bit Value
HCI/CCO/BI-157-C [LE CS Read Local Supported Capabilities, RTT Sounding, 150 ns, LE 2M PHY]	RTT_2M_Sounding_N	v2	>0	4	0
HCI/CCO/BI-158-C [LE CS Read Local Supported Capabilities, RTT Sounding, 10 ns, LE 2M PHY]	RTT_2M_Sounding_N	v2	>0	4	1
HCI/CCO/BI-159-C [LE CS Read Local Supported Capabilities, RTT Random Sequence, 150 ns, LE 2M PHY]	RTT_2M_Random_Sequence_N	v2	>0	5	0
HCI/CCO/BI-160-C [LE CS Read Local Supported Capabilities, RTT Random Sequence, 10 ns, LE 2M PHY]	RTT_2M_Random_Sequence_N	v2	>0	5	1

Table 4.66: LE CS Read Local Supported Capabilities test cases

- Test Procedure
 1. The Upper Tester sends the HCI_LE_CS_Read_Local_Supported_Capabilities command version specified in Table 4.66 to the IUT.
 2. The IUT sends a successful HCI_Command_Complete event with return parameters as specified in Table 4.66 and valid values for all other parameters.

- Expected Outcome

Pass verdict

The IUT properly sets the RTT Capability Bit and Parameter to the Bit Value and Parameter Value specified in Table 4.66.

HCI/CCO/BV-26-C [LE CS Read Remote Supported Capabilities]

- Test Purpose

Verify that the IUT properly sends a Read_Remote_Supported_Capabilities_Complete event after receiving an HCI_LE_CS_Read_Remote_Supported_Capabilities command.
- Reference
 - [19] 7.8.131
- Initial Condition
 - The IUT and Lower Tester have an encrypted connection but have not performed a CS Capability Exchange.
- Test Procedure
 1. The Upper Tester sends the HCI_LE_CS_Read_Remote_Supported_Capabilities command to the IUT.
 2. The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 3. The IUT performs the Channel Sounding Capability Exchange procedure with the Lower Tester. The Lower Tester sets bit 90 to 1.

4. The IUT generates an LE_CS_Read_Remote_Supported_Capabilities_Complete event. The Subfeatures_Supported bit 0 is set to 0.

- Expected Outcome

Pass verdict

The IUT properly generates the LE_CS_Read_Remote_Supported_Capabilities_Complete event after the Channel Sounding Capability Exchange procedures has completed with Subfeatures_Supported bit 0 set to 0.

4.10.18 Reject LE CS Security Enable, Encryption

- Test Purpose

Verify that the IUT properly returns an error when the Host sends the LE CS Security Enable command when the IUT is a Central with an unencrypted connection or when the IUT is a Peripheral with an encrypted connection.

- Reference

[19] 7.8.133

- Initial Condition

- The IUT is in the Role as specified in [Table 4.67](#).
- Encrypted Connection: The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings and have created a configuration.
- Unencrypted Connection: The IUT and Lower Tester have an unencrypted connection.

- Test Case Configuration

Test Case	Initial Condition	Error Code
HCI/CCO/BI-82-C [Reject LE CS Security Enable, Encryption, Unencrypted Connection, Central]	Unencrypted Connection Role = Central	0x2F
HCI/CCO/BI-83-C [Reject LE CS Security Enable, Encryption, Peripheral]	Encrypted Connection Role = Peripheral	0x0C

Table 4.67: Reject LE CS Security Enable, Encryption test cases

- Test Procedure

1. The Upper Tester sends the HCI_LE_CS_Security_Enable command to the IUT with Connection_Handle set to the ACL connection handle.
2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to the value in [Table 4.67](#).

- Expected Outcome

Pass verdict

In Step 2, the IUT responds to the HCI Command with an HCI_Command_Status event with Status set to the value in [Table 4.67](#).

4.10.19 LE CS Set Default Settings, Disable Supported Role

- Test Purpose

Verify that the IUT properly returns an error when the HCI_LE_CS_Set_Default_Settings command is called disabling a role the IUT supports with a valid CS Configuration.

- Reference

[19] 7.8.134

- Initial Condition

- The IUT has the CS Role configuration as specified in [Table 4.68](#).
- The IUT and Lower Tester have an encrypted connection, completed the Capabilities Exchange procedure, and set default settings.

- Test Case Configuration

Test Case	Role
HCI/CCO/BI-84-C [LE CS Set Default Settings Disable Supported Role, Initiator]	Initiator
HCI/CCO/BI-85-C [LE CS Set Default Settings Disable Supported Role, Reflector]	Reflector

Table 4.68: LE CS Set Default Settings Disable Supported Role test cases

- Test Procedure

- The Upper Tester sends an LE_CS_Create_Config command with Role set as specified in [Table 4.68](#) and all other parameters valid and receives an HCI_Command_Status in response.
- The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester.
- The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT.
- The IUT sends a successful LE_CS_Config_Complete event to the Upper Tester.
- The Upper Tester sends an HCI_LE_CS_Set_Default_Settings command to the IUT with Role_Enable bit for the Role as specified in [Table 4.68](#) to 0b0, and a valid CS_SYNC_Antenna_Selection value.
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

- Expected Outcome

Pass verdict

In Step 6, the IUT responds to the HCI Command with an Invalid HCI Command Parameters (0x12) error code.

4.10.20 LE CS Set Default Settings, Invalid Parameters

- Test Purpose

Verify that the IUT properly returns an error when the Host sends the LE CS Set Default Settings command with invalid parameters.

- Reference

[19] 7.8.134

- Initial Condition

- The IUT and the Lower Tester have an encrypted ACL connection and exchanged capabilities.

- Test Case Configuration

Test Case	Parameters
HCI/CCO/BI-86-C [Reject LE CS Set Default Settings, Invalid Parameters, Initiator Not Supported]	Role_Enable bit 0 = set to 0b1 CS_SYNC_Antenna_Selection = valid value
HCI/CCO/BI-87-C [Reject LE CS Set Default Settings, Invalid Parameters, Reflector Not Supported]	Role_Enable bit 1 = set to 0b1 CS_SYNC_Antenna_Selection = valid value

Table 4.69: Reject LE CS Set Default Settings, Invalid Parameters test cases

- Test Procedure

- The Upper Tester sends the HCI_LE_CS_Set_Default_Settings command to the IUT with Parameters set as specified in [Table 4.69](#).
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 2, the IUT responds to the HCI Command with an HCI_Command_Complete event with Status set to Unsupported Feature or Parameter Value (0x11).

[HCI/CCO/BI-88-C \[LE CS Set Default Settings, Invalid Parameters, Antenna not Supported\]](#)

- Test Purpose

Verify that the IUT properly returns an error when the Host sends the LE CS Set Default Settings command with an unsupported Antenna Selection.

- Reference

[\[19\]](#) 7.8.134

- Initial Condition

- The IUT and the Lower Tester have an encrypted ACL connection and exchanged capabilities.

- Test Procedure

- The Upper Tester sends an HCI_LE_CS_Read_Local_Supported_Capabilities command to the IUT.
- The IUT sends a successful HCI_Command_Complete event with Num_Antennas_Supported.
- If Num_Antennas_Supported is 4, then the test ends with a Pass verdict.
- The Upper Tester sends an HCI_LE_CS_Set_Default_Settings command to the IUT with CS_SYNC_Antenna_Selection set to Num_Antennas_Supported + 1.
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 5, the IUT responds to the HCI Command with an HCI_Command_Complete event with Status set to Unsupported Feature or Parameter Value (0x11).

HCI/CCO/BI-89-C [LE CS Read Remote FAE Table, noFAE set by Peer]

- Test Purpose

Verify that the IUT properly returns an error when the HCI LE CS Read Remote FAE Table command is called when the peer has the noFAE bit set.

- Reference

- [19] 7.8.135

- Initial Condition

- The IUT has enabled the Initiator role.
 - The Lower Tester has the noFAE bit set in its capabilities.
 - The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Read_Remote_FAE_Table command to the IUT.
2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.
 - Alternative 2A (Successful Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 2A.2 The IUT sends an HCI_LE_CS_Read_Remote_FAE_Table_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).
 - Alternative 2B (Status = 0x11):
 - 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 2A.2 or 2B.1, the IUT responds with Status set to Unsupported Feature or Parameter Value (0x11).

HCI/CCO/BI-90-C [LE CS Write Cached Remote FAE Table, noFAE set by Peer]

- Test Purpose

Verify that the IUT properly returns an error when the HCI LE CS Write Cached Remote FAE Table command is called when the peer has the noFAE bit set.

- Reference

- [19] 7.8.136

- Initial Condition

- The IUT and the Lower Tester have an encrypted ACL connection, set default settings, and exchanged capabilities.
 - The Lower Tester has the noFAE bit set in its capabilities.
 - The IUT has enabled the Initiator role.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Write_Cached_Remote_FAE_Table command to the IUT with Remote_FAE_Table.



2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 2, the IUT responds with an HCI_Command_Complete event with Status set to Unsupported Feature or Parameter Value (0x11).

HCI/CCO/BI-91-C [LE CS Create Config, Disabled Role]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Create_Config command for a role that is disabled.

- Reference

[19] 7.8.137

- Initial Condition

- The IUT does not have a CS Role enabled by a prior HCI_LE_CS_Set_Default_Settings command.
- The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Role set to a supported role and all other values set to valid values.
2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.

Alternative 2A (Successful Status):

- 2A.1 The IUT sends a successful HCI_Command_Status event in response.
- 2A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Alternative 2B (Status = 0x12):

- 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x12 (Invalid HCI Command Parameters).

- Expected Outcome

Pass verdict

In Step 2A.2 or 2B.1, the IUT returns an error with Status set to 0x12 (Invalid HCI Command Parameters).

HCI/CCO/BI-92-C [LE CS Create Config, Invalid Channels]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Create_Config command with fewer than 15 channels.

- Reference

[19] 7.8.137

- Initial Condition
 - The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.
- Test Procedure
 1. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Config_ID set to 0, Channel_Map set with 14 random bits (excluding 0, 1, 23, 24, 25, 77, 78) set to 0b1, and all other values set to valid values.
 2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.
 - Alternative 2A (Successful Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 2A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status > 0.
 - Alternative 2B (Status > 0):
 - 2B.1 The IUT sends an HCI_Command_Status event with Status > 0.
- Expected Outcome

Pass verdict

In Step 2A.2 or 2B.1, the IUT returns an error with Status > 0.

HCI/CCO/BI-93-C [LE CS Create Config, Unsupported Parameters]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Create_Config command with values not supported by the local and remote controllers.
- Reference

[19] 7.8.137
- Initial Condition
 - The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.
 - The Lower Tester does not support Mode-3.
- Test Procedure

If the IUT supports all Channel Sounding configurable features, the test starts with Step 3.

 1. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with values not supported by the IUT.
 2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.
 - Alternative 2A (Successful Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 2A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).
 - Alternative 2B (Status = 0x11):
 - 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x11 (Unsupported Feature or Parameter Value).
 3. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Main_Mode_Type set to 0x03.

4. Perform either alternative 4A or 4B depending on the HCI_Command_Status response.
 - Alternative 4A (Successful Status):
 - 4A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 4A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status set to 0x11 (Unsupported Feature or Parameter Value).
 - Alternative 4B (Status = 0x11):
 - 4B.1 The IUT sends an HCI_Command_Status event with Status set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 2A.2 or 2B.1 and 4A.2 or 4B.1, the IUT returns an error with Status set to 0x11 (Unsupported Feature or Parameter Value).

HCI/CCO/BI-94-C [LE CS Remove Config, Invalid Config ID]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an invalid Config ID for the LE Remove CS Config command with a Config ID that does not exist and was removed.

- Reference

[19] 7.8.138

- Initial Condition

- The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Config_ID set to 1 and valid parameters and receives a successful HCI_Command_Status in response.
2. The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester with Config_ID set to 1 and Action set to 0b01.
3. The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT with Config_ID set to 1.
4. The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Config_ID set to 1, Status set to 0x00, and Action set to 0x01.
5. The Upper Tester sends an HCI_LE_CS_Remove_Config command to the IUT with Config_ID set to 1 and receives a successful HCI_Command_Status in response.
6. The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester with Config_ID set to 1 and Action set to 0b00.
7. The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT with Config_ID set to 1.
8. The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Config_ID set to 1, Status set to 0x00, and Action set to 0x00.
9. The Upper Tester sends an HCI_LE_CS_Remove_Config command to the IUT with Config_ID set to 1.
10. Perform either alternative 10A or 10B depending on the HCI_Command_Status response.
 - Alternative 10A (Successful Status):
 - 10A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 10A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Alternative 10B (Status = 0x12):

10B.1 The IUT sends an HCI_Command_Status event with Status set to 0x12 (Invalid HCI Command Parameters).

- Expected Outcome

Pass verdict

In Step 10A.2 or 10B.1, the IUT sends an HCI event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

HCI/CCO/BI-95-C [LE CS Set Procedure Parameters, Limited Resources]

- Test Purpose

Verify that the IUT properly returns an error when the Host makes calls to the LE CS Set Procedure Parameters command when resources are not available.

- Reference

[19] 7.8.140

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, exchanged capabilities, and created configurations.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.70](#). Skip the round if the HCI command cannot be called with a parameter that is out of range, for example, if the IXIT value is the highest range of a Max parameter.

- The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with the parameters set to a value outside of the IXIT value specified in [Table 4.70](#).
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0D (Rejected Due to Limited Resources).

Round	Parameter	IXIT Value
1	Max_Procedure_Len	TSPX_CS_Max_Procedure_Duration
2	Min_Procedure_Interval	TSPX_CS_Min_Procedure_Interval
3	Max_Procedure_Interval	TSPX_CS_Max_Procedure_Interval
4	Max_Procedure_Count	TSPX_CS_Max_Procedure_Count
5	Min_Subevent_Len	TSPX_CS_Min_Subevent_Len
6	Max_Subevent_Len	TSPX_CS_Max_Subevent_Len
7	Tone_Antenna_Config_Selection	TSPX_CS_Supported_ACI_Mask

Table 4.70: LE CS Set Procedure Parameters rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0D (Rejected Due to Limited Resources).

HCI/CCO/BI-149-C [LE CS Set Procedure Parameters, Invalid Parameter]

- Test Purpose

Verify that the IUT properly returns an error when the Host makes calls to the LE CS Set Procedure Parameters commands with invalid parameters.

- Reference

[19] 7.8.140

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, exchanged capabilities, and created configurations.

- Test Procedure

Repeat Steps 1 and 2 for each round in Table 4.71.

1. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with the parameters set as specified in Table 4.71.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Round	Parameter
1	Max_Procedure_Len = 0x0000
2	Min_Procedure_Interval > Max_Procedure_Interval where Max_Procedure_Count is a valid value greater than 1
3	Min_Subevent_Len > Max_Subevent_Len
4	Connection_Handle = 0xFFFF

Table 4.71: LE CS Set Procedure Parameters Invalid Parameters

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

HCI/CCO/BI-96-C [LE CS Set Procedure Parameters, Invalid Config ID]

- Test Purpose

Verify that the IUT properly returns an error when the Host makes calls to the LE CS Set Procedure Parameters commands where the Config ID is invalid.

- Reference

[19] 7.8.140

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, read the remote FAE, exchanged capabilities, executed the CS Security procedure, and set default settings.

- Test Procedure

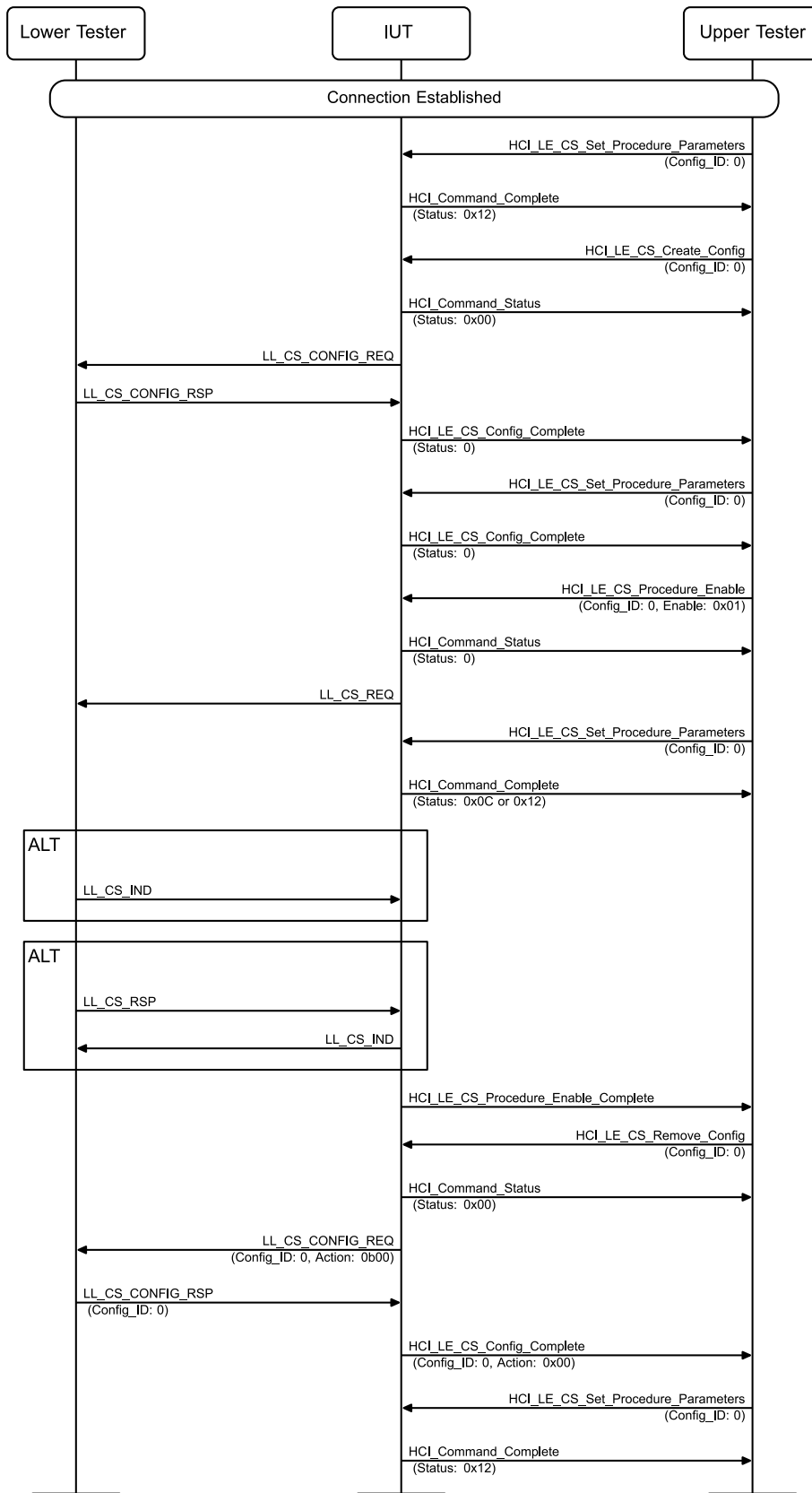


Figure 4.113: LE CS Set Procedure Parameters, Invalid Config ID MSC

1. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with parameters set to valid values and Config_ID set to 0.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).
3. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with parameters set to valid values and Config_ID set to 0 and receives a successful HCI_Command_Status in response.
4. The IUT and the Lower Tester complete the CS configuration procedure.
5. The IUT sends a successful HCI_LE_CS_Config_Complete event in response.
6. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with Config_ID set to 0 and receives a successful HCI_Command_Complete event in response.
7. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 0 and Enable set to 0x01.
8. The IUT sends a successful HCI_Command_Status event in response.
9. The IUT sends an LL_CS_REQ PDU to the Lower Tester.
10. Before completing the CS Start procedure, the Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with parameters set to valid values and Config_ID set to 0.
11. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters) or 0x0C (Command Disallowed).
12. The Lower Tester and the IUT complete the CS Start Procedure.
13. The IUT sends a LE_CS_Procedure_Enable_Complete event to the Upper Tester.
14. After CS Procedure has been completed, the Upper Tester sends an HCI_LE_CS_Remove_Config command to the IUT with the Config_ID set to 0 and receives a successful HCI_Command_Status event in response.
15. The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester with Config_ID set to 0 and Action set to 0b00.
16. The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT with Config_ID set to 0.
17. The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Config_ID set to 0 and Action set to 0x00.
18. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with parameters set to valid values and Config_ID set to 0.
19. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

- Expected Outcome

Pass verdict

In Steps 2 and 19, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

In Step 11, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters) or 0x0C (Command Disallowed).

HCI/CCO/BI-97-C [LE CS Procedure Enable after configuration and procedure parameters]

- Test Purpose

Verify that the IUT properly rejects the Upper Tester attempting to enable a CS Procedure until after the IUT has completed CS configuration and set the procedure parameters. The IUT also rejects an attempt to enable the procedure with the same configuration twice.

- Reference
[19] 7.8.141
- Initial Condition
 - The IUT and the Lower Tester have an encrypted connection, read remote FAE Table, completed CS security procedure, exchanged capabilities, and set default settings.
- Test Procedure

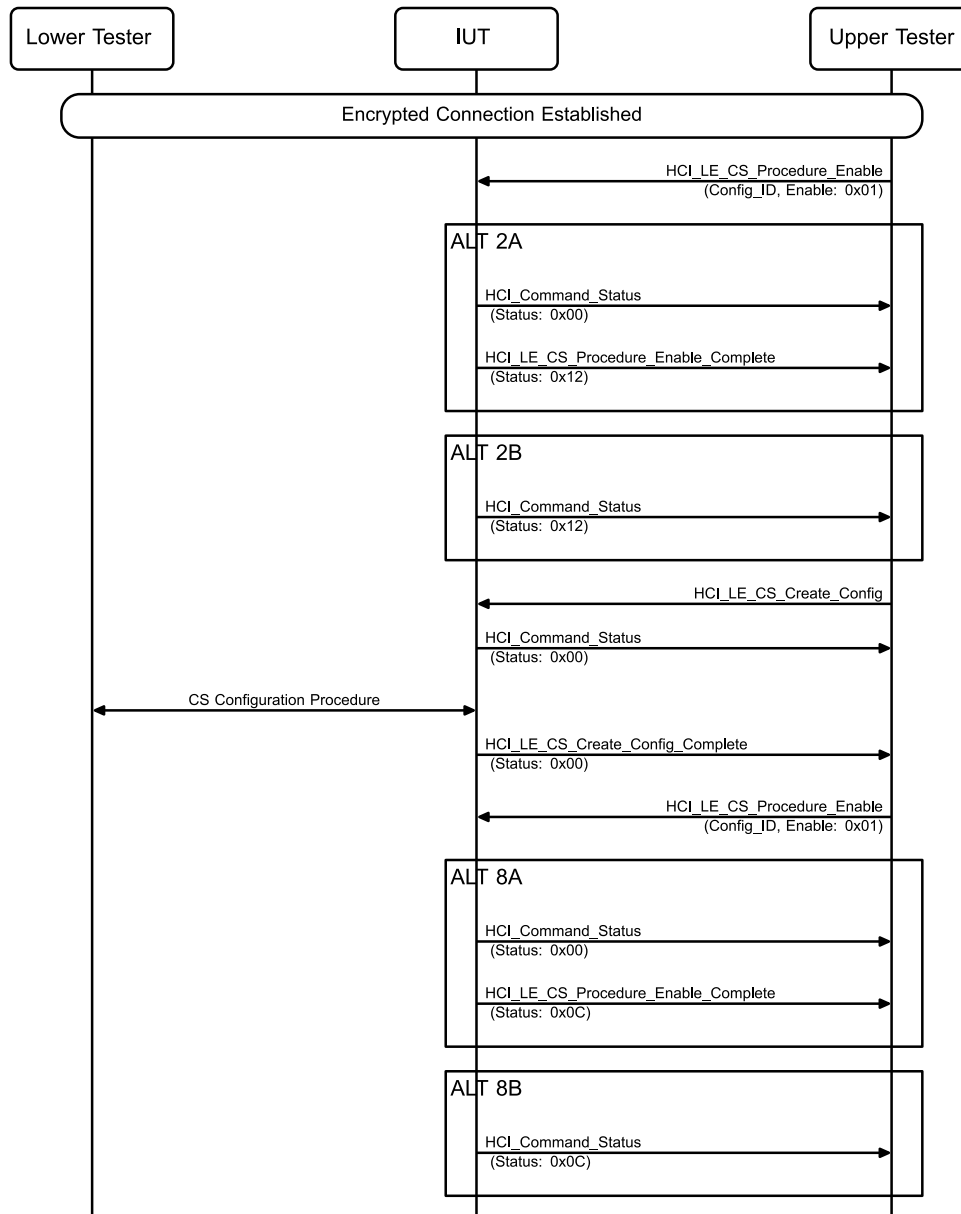


Figure 4.114: LE CS Procedure Enable, Invalid Parameters MSC – Page 1 of 2

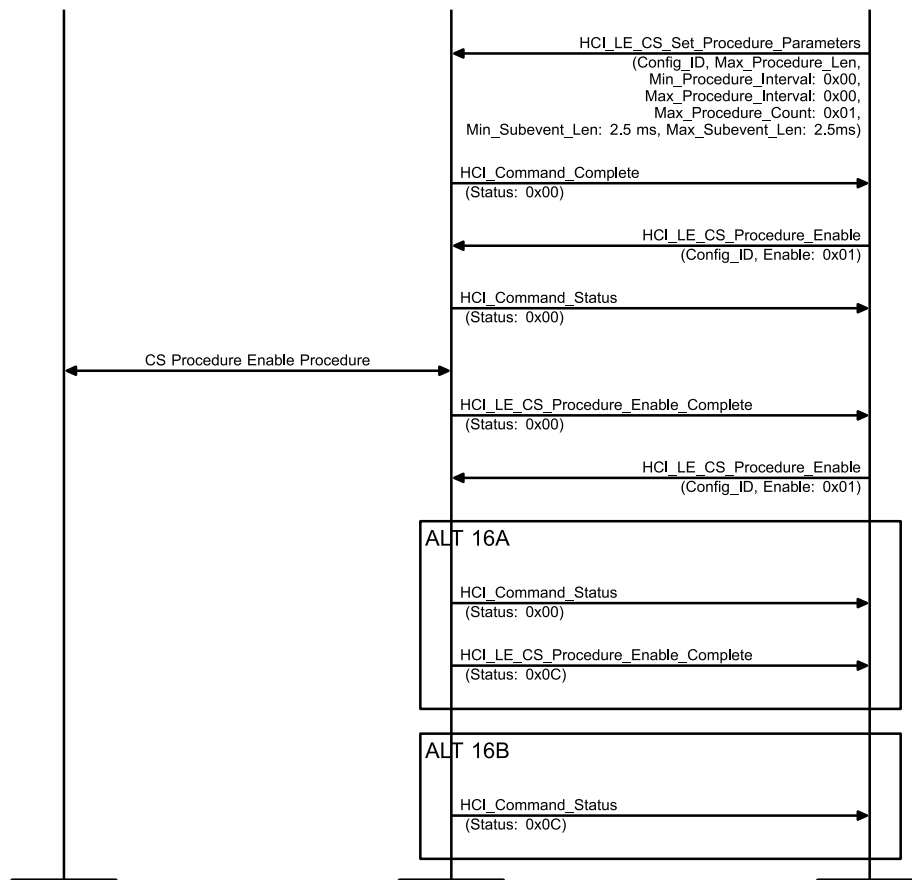


Figure 4.115: LE CS Procedure Enable, Invalid Parameters MSC – Page 2 of 2

1. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set a Config_ID that does not exist, and Enable set to 0x01.
2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.

Alternative 2A (Successful Status):

 - 2A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester in response.
 - 2A.2 The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Alternative 2B (Status = 0x12):

 - 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x12 (Invalid HCI Command Parameters).
3. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with parameters set to valid values.
4. The IUT sends a successful HCI_Command_Status event in response.
5. The Lower Tester and the IUT execute the CS configuration procedure.
6. The IUT sends a successful HCI_LE_CS_Config_Complete event to the Upper Tester.
7. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to the value used in Step 3 and Enable set to 0x01.

8. Perform either alternative 8A or 8B depending on the HCI_Command_Status response.

Alternative 8A (Successful Status):

 - 8A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 8A.2 The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 8B (Status = 0x0C):

 - 8B.1 The IUT sends an HCI_Command_Status event with Status set to 0x0C (Command Disallowed).
9. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters with Config_ID set to the value in Step 3, Max_Procedure_Len set to 0x7D00 (20s) or TSPX_CS_Max_Procedure_Duration (whichever is less), Min_Procedure_Interval and Max_Procedure_Interval set to 0x00, Max_Procedure_Count set to 0x01 or Min_Subevent_Len and Max_Subevent_Len set to 2.5ms, and all other parameters are valid.
10. The IUT sends a successful HCI_Command_Complete event in response.
11. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to the value used in Step 3, and Enable set to 0x01.
12. The IUT sends a successful HCI_Command_Status event in response.
13. The Lower Tester and the IUT exchange the CS Procedure Enable procedure.
14. The IUT sends a LE_CS_Procedure_Enable_Complete event.
15. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to the value used in Step 3, and Enable set to 0x01.
16. Perform either alternative 16A or 16B depending on the HCI_Command_Status response.

Alternative 16A (Successful Status):

 - 16A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 16A.2 The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 16B (Status = 0x0C):

 - 16B.1 The IUT sends an HCI_Command_Status event with Status set to 0x0C (Command Disallowed).

- Expected Outcome

Pass verdict

In Steps 2A.2 or 2B.1, the IUT sends an HCI event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

In Step 8A.2 or 8B.1 and 16A.2 or 16B.1, the IUT sends an HCI event to the Upper Tester with Status set to 0x0C (Command Disallowed).

4.10.21 CS Invalid Connection Handle

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an invalid connection handle for the CS commands.

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection.

- Test Case Configuration

Test Case	Reference	HCI Command HCI Event	HCI Command Response
HCI/CCO/BI-98-C [CS Invalid Connection Handle, LE CS Read Remote Supported Capabilities]	[19] 7.8.131	HCI_LE_CS_Read_Remote_Supported_Capabilities HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete	HCI_Command_Status
HCI/CCO/BI-99-C [CS Invalid Connection Handle, LE CS Security Enable]	[19] 7.8.133	HCI_LE_CS_Security_Enable HCI_LE_CS_Security_Enable_Complete	HCI_Command_Status
HCI/CCO/BI-100-C [CS Invalid Connection Handle, LE CS Set Default Settings]	[19] 7.8.134	HCI_LE_CS_Set_Default_Settings	HCI_Command_Complete
HCI/CCO/BI-101-C [CS Invalid Connection Handle, LE CS Read Remote FAE Table]	[19] 7.8.135	HCI_LE_CS_Read_Remote_FAE_Table HCI_LE_CS_Read_Remote_FAE_Table_Complete	HCI_Command_Status
HCI/CCO/BI-102-C [CS Invalid Connection Handle, LE CS Write Cached Remote FAE Table]	[19] 7.8.136	HCI_LE_CS_Write_Cached_Remote_FAE_Table	HCI_Command_Complete
HCI/CCO/BI-103-C [CS Invalid Connection Handle, LE CS Create Config]	[19] 7.8.137	HCI_LE_CS_Create_Config HCI_LE_CS_Config_Complete	HCI_Command_Status
HCI/CCO/BI-104-C [CS Invalid Connection Handle, LE CS Remove Config]	[19] 7.8.138	HCI_LE_CS_Remove_Config HCI_LE_CS_Config_Complete	HCI_Command_Status
HCI/CCO/BI-105-C [CS Invalid Connection Handle, LE CS Procedure Enable]	[19] 7.8.141	HCI_LE_CS_Procedure_Enable HCI_LE_CS_Procedure_Enable_Complete	HCI_Command_Status

Table 4.72: CS Invalid Connection Handle test cases

- Test Procedure

- The Upper Tester sends an HCI Command specified in [Table 4.72](#) to the IUT with Connection_Handle set to an invalid ACL, and all other parameters set to valid values.
- Perform either alternative 2A, 2B, or 2C depending on the Command Response in [Table 4.72](#).
 - Alternative 2A (HCI_Command_Status with Status = 0x00):
 - 2A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 2A.2 The IUT sends an HCI event specified in [Table 4.72](#) to the Upper Tester with Status set to 0x02 (Unknown Connection Identifier).
 - Alternative 2B (HCI_Command_Status with Status = 0x02):
 - 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x02 (Unknown Connection Identifier).

Alternative 2C (HCI_Command_Complete):

- 2C.1 The IUT sends an HCI_Command_Complete event with Status set to 0x02 (Unknown Connection Identifier).

- Expected Outcome

Pass verdict

In Step 2A.2, 2B.1, or 2C.1, the IUT sends an event to the Upper Tester with Status set to 0x02 (Unknown Connection Identifier).

HCI/CCO/BI-106-C [LE CS Create Config, Invalid Mode and Submode Combinations]

- Test Purpose

Verify that the IUT properly returns an error when the Host attempts to configure invalid combinations of the Main_Mode and Submode.

- Reference

[19] 7.8.137

- Initial Condition

- The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings and a supported Role has been enabled using Set_Default_Settings.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.73](#).

- The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Main_Mode_Type and Sub_Mode_Type set as specified in [Table 4.73](#) and a supported Role that has been enabled using Set_Default_Settings.
- Perform either alternative 2A or 2B depending on the HCI_Command_Status response.

Alternative 2A (Successful Status):

- 2A.1 The IUT sends a successful HCI_Command_Status event in response.
- 2A.2 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status > 0.

Alternative 2B (Status > 0):

- 2B.1 The IUT sends an HCI_Command_Status event with Status > 0.

Round	Main_Mode	Submode
1	1	1
2	1	2
3	1	3
4	2	2
5	3	1
6	3	3

Table 4.73: LE CS Create Config, Invalid Mode and Submode Combinations rounds

- Expected Outcome

Pass verdict

In Step 2A.2 or 2B.1, the IUT rejects the invalid Main_Mode and Submode combinations with an Error Status.

HCI/CCO/BI-107-C [Channel Sounding Commands, Channel Sounding Host Support Bit Not Set]

- Test Purpose

Verify that the IUT properly returns an error when the Channel Sounding (Host Support) feature bit is not set.

- Reference

[25] 7.8.130, 7.8.131, 7.8.132, 7.8.133, 7.8.157, 7.8.158

- Initial Condition

- The IUT and Lower Tester have an encrypted connection but have not performed a CS Capability Exchange.
- The Upper Tester has not set the Host Feature Bit.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.74](#).

1. The Upper Tester sends an HCI Command specified in [Table 4.74](#) to the IUT valid parameters.

2. Perform alternatives 2A, 2B, or 2C depending on the HCI response event.

Alternative 2A (HCI_Command_Status with Status = 0x00):

2A.1 The IUT sends a successful HCI_Command_Status event in response.

2A.2 The IUT sends an HCI event specified in [Table 4.74](#) to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 2B (HCI_Command_Status with Status = 0x0C):

2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x0C (Command Disallowed).

Alternative 2C (HCI_Command_Complete):

2C.1 The IUT sends an HCI_Command_Complete event with Status set to 0x0C (Command Disallowed).

Round	HCI Command/HCI Event	HCI Response
1	HCI_LE_CS_Read_Local_Supported_Capabilities No Event	HCI_Command_Complete
2	HCI_LE_CS_Read_Remote_Supported_Capabilities HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete	HCI_Command_Status
3	HCI_LE_CS_Write_Cached_Remote_Supported_Capabilities	HCI_Command_Complete
4	HCI_LE_CS_Security_Enable	HCI_Command_Status
5	HCI_LE_CS_Set_Security_Requirements	HCI_Command_Complete
6	HCI_LE_CS_Set_Default_Security_Requirements	HCI_Command_Complete

Table 4.74: Channel Sounding Commands, Channel Sounding Not Supported rounds

- Expected Outcome

Pass verdict

In Step 2A.2, 2B.1, or 2C.1, the IUT sends an event to the Upper Tester with Status set to 0x0C (Command Disallowed).

4.10.22 LE CS Read Remote Supported Capabilities, Remote CS Host Bit Not Set

- Test Purpose

Verify that the IUT properly returns an error when the Lower Tester does not have the Channel Sounding Host Bit set.

- Reference

[19] 7.8.131

- Initial Condition

- The IUT is in the Role as specified in Table 4.75.
- The IUT and Lower Tester have an encrypted connection.
- The Lower Tester does not have the Channel Sounding Host Bit set.

- Test Case Configuration

Test Case	Role
HCI/CCO/BI-108-C [LE CS Read Remote Supported Capabilities, Remote CS Host Bit Not Set, Central]	Central
HCI/CCO/BI-109-C [LE CS Read Remote Supported Capabilities, Remote CS Host Bit Not Set, Peripheral]	Peripheral

Table 4.75: LE CS Read Remote Supported Capabilities, Remote CS Host Bit Not Set test cases

- Test Procedure

- If the IUT autonomously performed a feature exchange, skip to Step 3.
- Perform alternative 2A or 2B depending on the IUT role.

Alternative 2A (IUT is a Central):

 - The Upper Tester sends an HCI_LE_Read_Remote_Features_Page_0 command to the IUT and receives a successful HCI_Command_Status in response.
 - The IUT sends an LL_FEATURE_REQ to the Lower Tester.
 - The Lower Tester sends an LL_FEATURE_RSP to the IUT.
 - The IUT sends an HCI_LE_Read_Remote_Features_Page_0_Complete event to the Upper Tester.

Alternative 2B (IUT is a Peripheral):

 - The Lower Tester sends an LL_FEATURE_REQ to the IUT.
 - The IUT sends an LL_FEATURE_RSP to the Lower Tester.
- The Upper Tester sends an HCI_LE_CS_Read_Remote_Supported_Capabilities command to the IUT.
- Perform either alternative 4A or 4B depending on the HCI response event.

Alternative 4A (HCI_Command_Status with Status = 0x00):

 - The IUT sends a successful HCI_Command_Status event in response.
 - The IUT sends an HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 4B (HCI_Command_Status with Status = 0x0C):

 - The IUT sends an HCI_Command_Status event with Status set to 0x0C (Command Disallowed).

- Expected Outcome

Pass verdict

In Step 4A.2 or 4B.1, the IUT sends an event to the Upper Tester with Status set to 0x0C (Command Disallowed).

HCI/CCO/BI-110-C [LE CS Set Channel Classification, RFU Channels]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Set_Channel_Classification command with RFU Channels in the channel map.

- Reference

[19] 7.8.139

- Initial Condition

- The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.76](#). Each round has an interval of 1.25 seconds.

- The Upper Tester sends an HCI_LE_CS_Set_Channel_Classification command to the IUT with Channel_Classification set with 14 valid channel bits set to 0b1 and the bit specified in [Table 4.76](#) set to 0b1.
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

Round	Channel Bit
1	0
2	1
3	23
4	24
5	25
6	77
7	78

Table 4.76: LE CS Set Channel Classification, RFU Channels rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with Status set to 0x12.

HCI/CCO/BI-111-C [LE CS Set Channel Classification, Invalid Interval]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Set_Channel_Classification command at an interval shorter than 1 second. The IUT returns an error when successive calls the HCI_LE_CS_Set_Channel_Classification shorter than 1 second.

- Reference
[\[19\]](#) 7.8.139
- Initial Condition
 - The IUT and Lower Tester have an encrypted connection, exchanged capabilities, and set default settings.
- Test Procedure
 1. The Upper Tester sends an HCI_LE_CS_Set_Channel_Classification command to the IUT with Channel_Classification set to at least 15 valid bits.
 2. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
 3. Less than 1 second after Step 1, the Upper Tester sends an HCI_LE_CS_Set_Channel_Classification command to the IUT with Channel_Classification set to at least 15 valid bits.
 4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).
 5. At least 1 second after Step 1, the Upper Tester sends an HCI_LE_CS_Set_Channel_Classification command to the IUT with Channel_Classification set to at least 15 valid bits.
 6. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
- Expected Outcome

Pass verdict

In Step 4, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

In Step 6, the IUT sends a successful HCI_Command_Complete event to the Upper Tester.

Inconclusive verdict

The Upper Tester is unable to execute Step 3 in less than 1 second after Step 1.

HCI/CCO/BI-112-C [LE CS Create Config, Peer Capabilities Unknown]

- Test Purpose

Verify that the IUT properly handles the Upper Tester sending an HCI_LE_CS_Create_Config command when the Peer capabilities are unknown.
- Reference
[\[19\]](#) 7.8.137
- Initial Condition
 - The IUT and Lower Tester have an encrypted connection and set default settings but have not exchanged capabilities.

- Test Procedure
 1. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Role set to a supported role and all other values set to valid values.
 2. Perform either alternative 2A or 2B depending on the HCI_Command_Status response.

Alternative 2A (Successful Status):

 - 2A.1 The IUT sends a successful HCI_Command_Status event in response.
 - 2A.2 Perform either alternative 2A.2A or 2A.2B depending on the LL capabilities exchange initiated by IUT.

Alternative 2A.2A (IUT initiates an LL capabilities exchange):

 - 2A.2A.1 The IUT sends an LL_CS_CAPABILITIES_REQ PDU to the Lower Tester.
 - 2A.2A.2 The Lower Tester sends an LL_CS_CAPABILITIES_RSP PDU to the IUT. The IUT stores the remote capabilities to use in round 2.
 - 2A.2A.3 The IUT sends an HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete event to the Upper Tester.
 - 2A.2A.4 Skip to Step 5.

Alternative 2A.2B (IUT does not initiate an LL capabilities exchange):

 - 2A.2B.1 The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 2B (Status = 0x0C):

 - 2B.1 The IUT sends an HCI_Command_Status event with Status set to 0x0C (Command Disallowed).
 3. Execute either alternative 3A or 3B depending on the execution round.

Alternative 3A (First execution round):

 - 3A.1 The Upper Tester sends an HCI_LE_CS_Read_Remote_Supported_Capabilities command to the IUT and receives a successful HCI_Command_Status event in response.
 - 3A.2 The IUT sends an LL_CS_CAPABILITIES_REQ PDU to the Lower Tester.
 - 3A.3 The Lower Tester sends an LL_CS_CAPABILITIES_RSP PDU to the IUT.
 - 3A.4 The IUT sends an HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete event to the Upper Tester.

Alternative 3B (Second round):

 - 3B.1 The Upper Tester sends an HCI_LE_CS_Write_Cached_Remote_Supported_Capabilities command to the IUT with valid configurations using the stored capabilities returned in the remote capabilities procedure.
 - 3B.2 The IUT sends a successful HCI_Command_Complete even to the Upper Tester.
 4. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Role set to a supported role and all other values set to valid values and receives a successful HCI_Command_Status in response.
 5. The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester.
 6. The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT.
 7. The IUT sends a successful HCI_LE_CS_Config_Complete event to the Upper Tester.
 8. The IUT and the Lower Tester disconnect and reconnect and return to the Initial Condition state.
 9. Repeat Steps 1 to 7 and execute Alternative 3B.

- Expected Outcome

Pass verdict

In Step 2A.2B.1 or 2B.1, the IUT returns an error with Status set to 0x0C (Command Disallowed).

In Step 2A.2A.1, the IUT initiates a CS capabilities exchange before beginning the CS configuration procedure.

In Step 7, the IUT sends a successful HCI_LE_CS_Config_Complete event to the Upper Tester.

4.10.23 Reject CS Start Procedure When IUT Configuration has not completed

- Test Purpose

Verify that a Central IUT rejects the CS Start Procedure when capability exchange, configuration, and security procedures have not been completed.

- Reference

[18] 5.1.25, 5.1.26

- Initial Condition

- The Central IUT and Lower Tester have an encrypted connection but have not exchanged capabilities.

- Test Case Configuration

Test Case	IUT Role
HCI/CCO/BI-113-C [Reject CS Start Procedure When IUT Configuration has not completed, Initiator]	Initiator
HCI/CCO/BI-114-C [Reject CS Start Procedure When IUT Configuration has not completed, Reflector]	Reflector

Table 4.77: Reject CS Start Procedure When IUT Configuration has not completed test cases

- Test Procedure

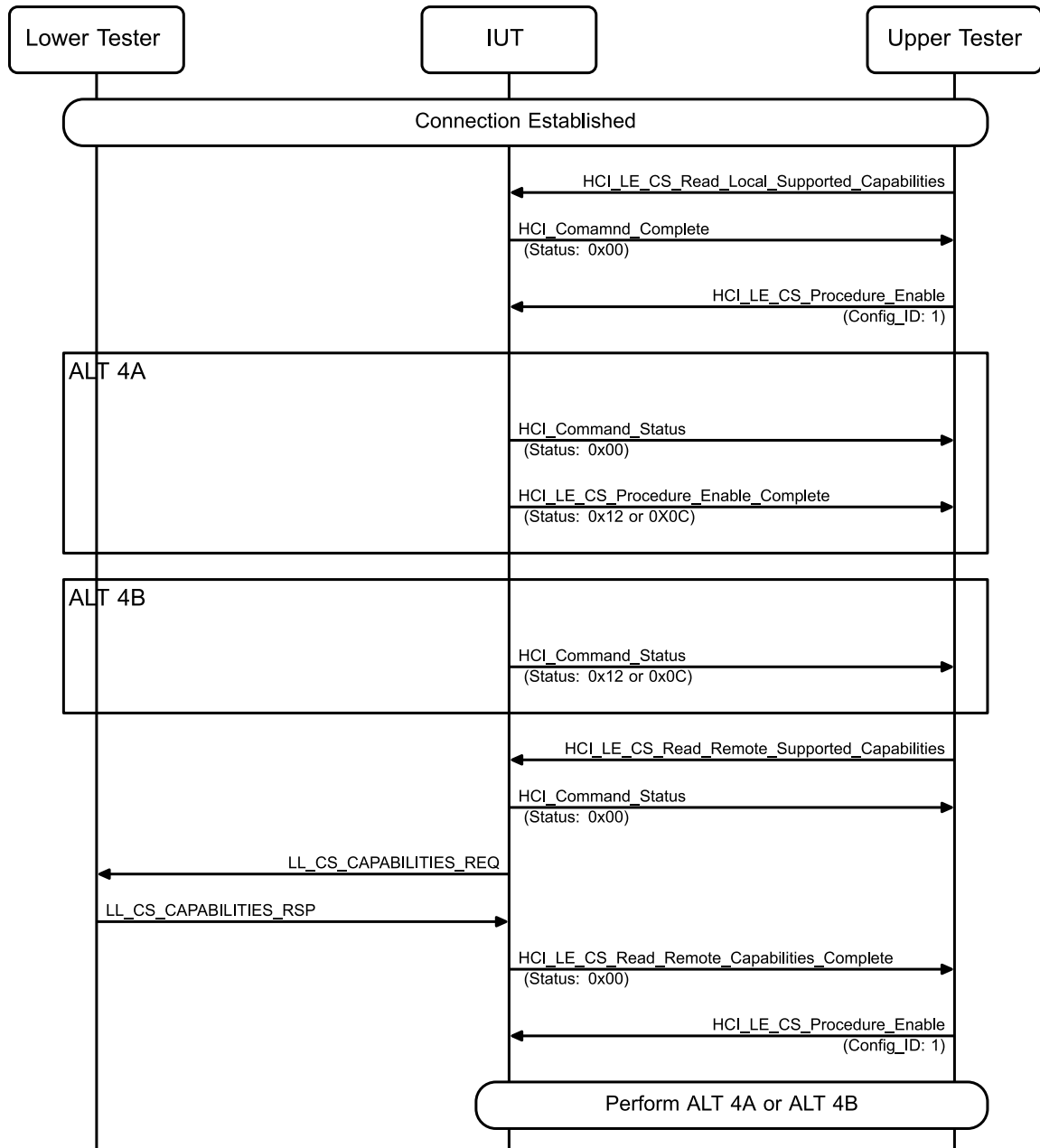


Figure 4.116: Reject CS Start Procedure when IUT Configuration has not completed MSC – Page 1 of 2

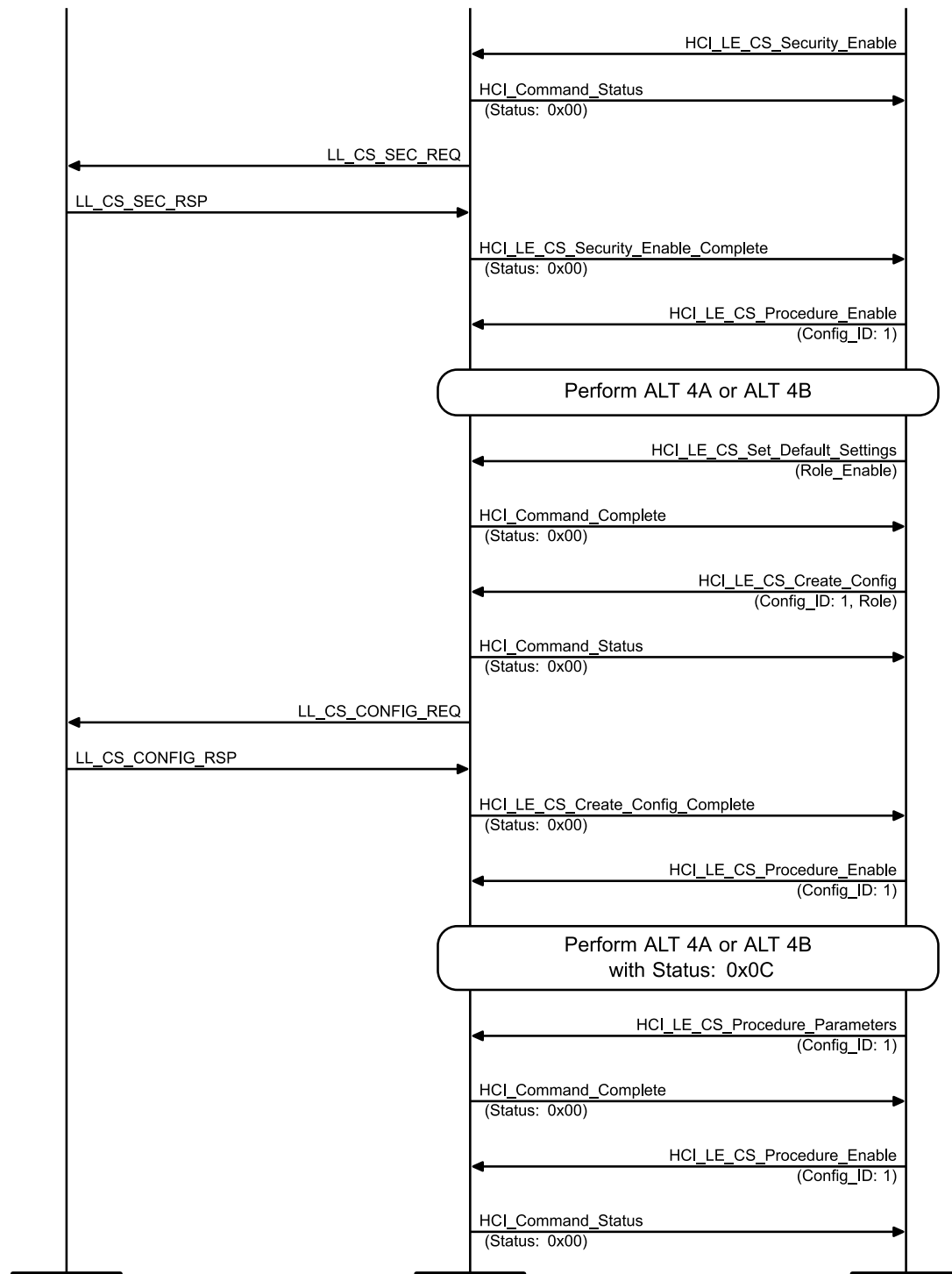


Figure 4.117: Reject CS Start Procedure when IUT Configuration has not completed MSC – Page 2 of 2

1. The Upper Tester sends an HCI_LE_CS_Read_Local_Supported_Capabilities command to the IUT.
2. The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
3. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 1.

4. Perform alternative 4A or 4B depending on the IUT response.
Alternative 4A (Successful HCI_Command_Status):
 - 4A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 4A.2 The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters) or 0x0C (Command Disallowed).
 Alternative 4B (The IUT returns an HCI_Command_Status event with an 0x12 (Invalid HCI Command Parameters or 0x0C (Command Disallowed)):
 - 4B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters) or 0x0C (Command Disallowed).
5. The Upper Tester sends an HCI_LE_CS_Read_Remote_Supported_Capabilities command to the IUT.
6. The IUT sends a successful HCI_Command_Status event to the Upper Tester.
7. The IUT sends an LL_CS_CAPABILITIES_REQ PDU to the Lower Tester.
8. The Lower Tester sends an LL_CS_CAPABILITIES_RSP PDU to the IUT with No_FAE set to 1.
9. The IUT sends a successful HCI_LE_CS_Read_Remote_Supported_Capabilities_Complete event to the Upper Tester.
10. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 1.
11. Perform Step 4.
12. The Upper Tester sends an HCI_LE_CS_Security_Enable command to the IUT and receives a successful HCI_Command_Status in response.
13. The IUT sends an LL_CS_SEC_REQ PDU to the Lower Tester.
14. The Lower Tester sends an LL_CS_SEC_RSP PDU to the IUT.
15. The IUT sends a successful HCI_LE_CS_Security_Enable_Complete event to the Upper Tester.
16. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 1.
17. Perform Step 4.
18. The Upper Tester sends an HCI_LE_CS_Set_Default_Settings to the IUT with Role_Enable set as specified in [Table 4.77](#) and receives a successful HCI_Command_Complete event in response.
19. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with Config_ID set to 1, Role set to the Role in [Table 4.77](#), and all other parameters with valid values and receives a successful HCI_Command_Status event to the Upper Tester.
20. The IUT sends an LL_CS_CONFIG_REQ PDU to the Lower Tester with the same parameters sent in Step 12.
21. The Lower Tester sends an LL_CS_CONFIG_RSP PDU to the IUT with Config_ID Set to 1.
22. The IUT sends an HCI_LE_CS_Config_Complete event to the Upper Tester with a Config_ID.
23. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 1.
24. Perform Step 4 however the Status is set to 0x0C (Command Disallowed) instead.
25. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with Config_ID set to 1 and receives a successful HCI_Command_Complete event in response.
26. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT.
27. The IUT sends a successful HCI_Command_Status event to the Upper Tester.

- Expected Outcome

Pass verdict

In Steps 4, 11, 17, and 24, the IUT rejects the HCI_LE_CS_Procedure_Enable command with an error code.

In Step 27, the IUT successfully starts the CS Procedure Enable procedure.

HCI/CCO/BI-115-C [LE CS Set Procedure Parameters, Invalid Preferred Peer Antenna]

- Test Purpose

Verify that the IUT properly returns an Invalid HCI Command Parameters error when the Host makes calls to the LE CS Set Procedure Parameters commands with Preferred Peer Antenna set to 0x00.

- Reference

[1] 7.8.140

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, read remote FAE Table, completed CS security procedure, exchanged capabilities, and created configurations.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with Preferred_Peer_Antenna set to 0x00.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an 0x12 error.

4.10.24 HCI command fails when address is the IUT address

- Test Purpose

Verify that the IUT correctly rejects the HCI command when BD_ADDR is set to the IUT device address.

- Initial Condition

- The IUT is in Standby.

- Test Case Configuration

Test Case	Reference	HCI Command	HCI Event
HCI/CCO/BI-118-C [HCI fails with address is the IUT address, Create Connection]	[8] 7.1.5	HCI_Create_Connection	HCI_Connection_Complete
HCI/CCO/BI-119-C [HCI fails with address is the IUT address, Truncated Page]	[8] 7.1.47	HCI_Truncated_Page	HCI_Truncated_Page_Complete

Table 4.78: HCI command fails with address is the IUT address test cases

- Test Procedure
 1. The Upper Tester sends the HCI command specified in [Table 4.78](#) to the IUT with BD_ADDR set to the IUT device address.
 2. Perform either Alternative 2A or 2B depending on the IUT response.
 - Alternative 2A (Successful HCI_Command_Status):
 - 2A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2A.2 The IUT sends the HCI Event specified in [Table 4.78](#) to the Upper Tester with a non-zero Status.
 - Alternative 2B (HCI_Command_Status with an error code):
 - 2B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with a non-zero Status.

- Expected Outcome

Pass verdict

In Steps 2A.2 or 2B.1, the IUT sends an event with a non-zero error code.

The IUT does not transmit any paging packets from the start of Step 1 until at least 5 seconds after the end of Step 2.

Warning

In Steps 2A.1 or 2B.1, the IUT sends an event with the error code Page_Timeout (0x04).

HCI/CCO/BI-120-C [LE Set Default Subrate, Invalid Parameters]

- Test Purpose

Verify that the LE Set Default Subrate command properly returns an error when there are invalid parameters.
- Reference

[\[1\]](#) 7.8.123
- Initial Condition
 - The IUT is in standby.
- Test Procedure
 1. The Upper Tester sends an HCI_LE_Set_Default_Subrate command to the IUT with Subrate_Min set to 1, Subrate_Max set to 3, and Max_Latency set to 166.
 2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).
 3. The Upper Tester sends an HCI_LE_Set_Default_Subrate command to the IUT with Subrate_Min set to 2 and Subrate_Max set to 1.
 4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).
 5. The Upper Tester sends an HCI_LE_Set_Default_Subrate command to the IUT with Subrate_Min set to 1, Subrate_Max set to 2, and Continuation_Number set to 3.
 6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Steps 2, 4, and 6, the IUT returns a 0x12 error code.

4.10.25 LE CS Set Procedure Parameters, Unsupported PHY

- Test Purpose

Verify that the IUT properly returns an error when the Host makes calls to the LE CS Set Procedure Parameters commands with an unsupported PHY.

- Reference

[19] 7.8.140

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, exchanged capabilities, and created configurations.

- Test Case Configuration

Test Case	PHY
HCI/CCO/BI-125-C [LE CS Set Procedure Parameters, Unsupported PHY, LE 2M PHY]	LE 2M PHY
HCI/CCO/BI-126-C [LE CS Set Procedure Parameters, Unsupported PHY, LE Coded PHY, S=8]	LE Coded PHY, S=8
HCI/CCO/BI-127-C [LE CS Set Procedure Parameters, Unsupported PHY, LE Coded PHY, S=2]	LE Coded PHY, S=2

Table 4.79: LE CS Set Procedure Parameters, Unsupported PHY test cases

- Test Procedure

- The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with the parameters set to valid values and the PHY value specified in [Table 4.79](#).
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to a valid error code.

- Expected Outcome

Pass verdict

In Step 2, the IUT responds with a valid error code.

HCI/CCO/BI-134-C [LE Create Connection, Invalid Parameters]

- Test Purpose

Verify that the IUT properly handles the Host sending invalid parameters for the LE Create Connection command.

- Reference

[17] 7.8.12

- Initial Condition

- The IUT is in the Initiating state.



- Test Procedure
 1. The Upper Tester sends the HCI_LE_Create_Connection command with the Min_CE_Length > Max_CE_Length and all other parameters set to valid values.
 2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Status event with Status set to (0x12).

4.10.26 Reject LE Connection Rate Request when peer Shorter Connection Intervals Host Support not set

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Rate_Request command when the peer device does not have the Shorter Connection Intervals (Host Support) bit set.
- Reference

[23] 7.8.154

[24] 5.1.33
- Initial Condition
 - The IUT is in the role specified in [Table 4.80](#).
 - The IUT and the Lower Tester have a connection.
 - The Lower Tester does not have the Shorter Connection Intervals (Host Support) bit set.
 - The Lower Tester has initiated and completed a Feature Exchange procedure with the IUT with the Shorter Connection Intervals feature set in Page 1.
- Test Case Configuration

Test Case	Role
HCI/CCO/BI-135-C [Reject LE Connection Rate Request when peer Shorter Connection Intervals Host Support not set, Peripheral]	Peripheral
HCI/CCO/BI-136-C [Reject LE Connection Rate Request when peer Shorter Connection Intervals Host Support not set, Central]	Central

Table 4.80: Reject LE Connection Rate Request when peer Shorter Connection Intervals Host Support not set test cases

- Test Procedure
 1. The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT.
 2. Perform either alternative 2A or 2B depending on the IUT's response.

Alternative 2A (Successful HCI_Command_Status):

 - 2A.1 The IUT sends a successful HCI_Command_Status to the Upper Tester.
 - 2A.2 The IUT sends an HCI_LE_Connection_Rate_Change event to the Upper Tester with Status set to 0x1A.

Alternative 2B (HCI_Command_Status with Status = 0x1A):

 - 2B.1 The IUT sends an HCI_Command_Status to the Upper Tester with Status set to 0x1A.



- Expected Outcome

Pass verdict

In Step 2, the IUT rejects the HCI_LE_Connection_Rate_Request command.

4.10.27 Connection Rate commands, invalid parameters

- Test Purpose

Verify that the IUT rejects an HCI command with invalid parameters.

- Initial Condition

- The IUT and the Lower Tester have a connection.
- The Lower Tester has initiated and completed a Feature Exchange procedure with the IUT with the Shorter Connection Intervals feature set in Page 1.
- The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.

- Test Case Configuration

Test Case	Reference	HCI Command/Event
HCI/CCO/BI-137-C [Connection Rate commands, invalid parameters, HCI_LE_Connection_Rate_Request]	[23] 7.8.154	HCI_LE_Connection_Rate_Request HCI_Command_Status
HCI/CCO/BI-138-C [Connection Rate commands, invalid parameters, HCI_LE_Set_Default_Rate_Parameters]	[23] 7.8.155	HCI_LE_Set_Default_Rate_Parameters HCI_Command_Complete

Table 4.81: Connection Rate commands, invalid parameters test cases

- Test Procedure

Repeat Steps 1 and 2 for each round in [Table 4.82](#).

- The Upper Tester sends the HCI Command/Event specified in [Table 4.81](#) to the IUT with the Parameters in [Table 4.82](#).
- Perform either alternative 2A or 2B depending on the HCI Command/Event specified in [Table 4.81](#).

Alternative 2A (HCI_Command_Complete):

- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12.

Alternative 2B (HCI_Command_Status):

Perform either alternative 2B.1 or 2B.2 depending on the IUT's response.

Alternative 2B.1 (Successful HCI_Command_Status):

- The IUT sends a successful HCI_Command_Status to the Upper Tester.
- The IUT sends an HCI_LE_Connection_Rate_Change event to the Upper Tester with Status set to 0x12.

Alternative 2B.2 (HCI_Command_Status with Status = 0x12):

- The IUT sends an HCI_Command_Status to the Upper Tester with Status set to 0x12.

- The Upper Tester sends the HCI_LE_Read_Minimum_Supported_Connection_Interval command to the IUT and receives a successful HCI_Command_Complete event with the Minimum_Supported_Connection_Interval parameters. If Minimum_Supported_Connection_Interval is 375 μ s, then the test ends with a Pass verdict.

4. The Upper Tester sends an HCI command specified in [Table 4.81](#) to the IUT with Connection_Interval_Min set to the Minimum_Supported_Connection_Interval from Step 4, 125 µs.
5. The IUT returns an error to the Upper Tester by executing Step 2 with a 0x20 Error code.

Round	Invalid Parameter
1	Connection_Interval_Min = 0x7D01
2	Connection_Interval_Max = 0x0002
3	Connection_Interval_Max = 0x7D01
4	Connection_Interval_Min = 4 Connection_Interval_Max = 3
5	Subrate_Min = 0
6	Subrate_Min = 0x1F5
7	Subrate_Max = 0
8	Subrate_Max = 0x1F5
9	Subrate_Min = 2 Subrate_Max = 1
10	Max_Latency = 0x1F4
11	Continuation_Number = 0x1F4
12	Supervision_Timeout = 0x0009
13	Supervision_Timeout = 0x0C81
14	Min_CE_Length > Max_CE_Length
15	Min_CE_Length = 0x7D00
16	Max_CE_Length = 0x7D00

Table 4.82: Connection Rate commands, invalid parameters rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT rejects the HCI command with error code 0x12.

In Step 5, the IUT rejects the HCI command with error code 0x20.

HCI/CCO/BI-139-C [Reject LE Connection Rate Request when Connection Parameters Request in progress]

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Rate_Request command when the IUT has a Connection Parameters Request in progress.

- Reference

[\[23\]](#) 7.8.154

[\[24\]](#) 5.1.33

- Initial Condition
 - The IUT is in the Peripheral role.
 - The IUT and the Lower Tester have a connection.
 - The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.
- Test Procedure
 1. The Upper Tester sends an HCI_LE_Connection_Update command to the IUT with Max_Latency set to 0x100.
 2. The IUT sends an LL_CONNECTION_PARAM_REQ PDU to the Lower Tester with Latency set to 0x100.
 3. The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT with Max_Latency set to 0x01.
 4. The IUT may initiate and complete a Feature Exchange procedure with the Lower Tester with both devices setting the Shorter Connection Intervals feature in Page 1.
 5. Perform either alternative 5A or 5B depending on the IUT's response.
 - Alternative 5A (Successful HCI_Command_Status):
 - 5A.1 The IUT sends a successful HCI_Command_Status to the Upper Tester.
 - 5A.2 The IUT sends an HCI_LE_Connection_Rate_Change event to the Upper Tester with Status > 0.
 - Alternative 5B (HCI_Command_Status with Status > 0):
 - 5B.1 The IUT sends an HCI_Command_Status to the Upper Tester with Status > 0.

- Expected Outcome

Pass verdict

In Step 5, the IUT rejects the HCI_LE_Connection_Rate_Request command.

HCI/CCO/BI-140-C [Reject LE Connection Rate Request when Connection Subrate Request in progress]

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Rate_Request command when the IUT has a Connection Subrate Request in progress.
- Reference
 - [23] 7.8.154
 - [24] 5.1.33
- Initial Condition
 - The IUT is in the Peripheral role.
 - The IUT and the Lower Tester have a connection.
 - The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.

- Test Procedure
 1. The Upper Tester sends an HCI_LE_Subrate_Request command to the IUT with Max_Latency set to 0x100.
 2. The IUT may initiate and complete a Feature Exchange procedure with the Lower Tester with both devices setting the Shorter Connection Intervals feature in Page 1.
 3. The IUT sends an LL_SUBRATE_REQ PDU to the Lower Tester with Max_Latency set to 0x100.
 4. The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT with Max_Latency set to 0x01.
 5. Perform either alternative 5A or 5B depending on the IUT's response.
 - Alternative 5A (Successful HCI_Command_Status):
 - 5A.1 The IUT sends a successful HCI_Command_Status to the Upper Tester.
 - 5A.2 The IUT sends an HCI_LE_Connection_Rate_Change event to the Upper Tester with Status > 0.
 - Alternative 5B (HCI_Command_Status with Status > 0):
 - 5B.1 The IUT sends an HCI_Command_Status to the Upper Tester with Status > 0.

- Expected Outcome

Pass verdict

In Step 5, the IUT rejects the HCI_LE_Connection_Rate_Request command.

4.10.28 Reject LE Connection Rate Request when a Channel Sounding procedure in progress

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Rate_Request command when the IUT has a Channel Sounding procedure in progress.
- Reference

[23] 7.8.154

[24] 5.1.33
- Initial Condition
 - The IUT is in the Peripheral role.
 - The IUT and the Lower Tester have a connection.
 - The Lower Tester has initiated and completed a Feature Exchange procedure with the IUT with the Shorter Connection Intervals feature set in Page 1.
 - The maximum CS procedure duration is defined by the TSPX_CS_Max_Procedure_Duration IXIT value.
 - The IUT and the Lower Tester have completed the CS Security Start and Capabilities Exchange procedures and Set Default Settings with the CS Role set to the value specified in Table 4.83 and the Max_Procedures_Supported field a value different than 1.
 - The IUT and the Lower Tester have completed the CS Configuration Procedure with the parameters specified in Section 4.14.2.2, Default Channel Sounding Parameters, and Main_Mode set to 1, Sub_Mode_Type set to 0xFF, Min_Main_Mode_Steps set to 0, Max_Main_Mode_Steps set to 0, and Mode_0_Steps set to 3.
 - The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.

- Test Case Configuration

Test Case	Channel Sounding Role
HCI/CCO/BI-141-C [Reject LE Connection Rate Request when a Channel Sounding procedure in progress, Initiator]	Initiator
HCI/CCO/BI-142-C [Reject LE Connection Rate Request when a Channel Sounding procedure in progress, Reflector]	Reflector

Table 4.83: Reject LE Connection Rate Request when a Channel Sounding procedure in progress test cases

- Test Procedure

- The Lower Tester sends an LL_CS_REQ PDU to the IUT with Max_Procedure_Len set to 0x7D00 (20 s) or TSPX_CS_Max_Procedure_Duration (whichever is less), Procedure_Interval set to 0x32, Procedure_Count set to N_Procedure, Subevent_Len set to 2.5 ms, and all valid parameters.
- The IUT sends an LL_CS_RSP PDU to the Lower Tester.
- The Lower Tester sends an LL_CS_IND PDU to the IUT.
- The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with State set to 0x01.
- The IUT and the Lower Tester exchange Mode-0 and Mode-1 CS_SYNC procedures.
- The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT.
- Perform either alternative 7A or 7B depending on the IUT's response.
 - Alternative 7A (Successful HCI_Command_Status):
 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_Connection_Rate_Change event to the Upper Tester with Status set to 0x0C.
 - Alternative 7B (HCI_Command_Status with Status = 0x0C):
 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.
- The Lower Tester sends an LL_CS_TERMINATE_REQ PDU to the IUT with a CsProcCount.
- The IUT sends an LL_CS_TERMINATE_RSP PDU to the Lower Tester.
- The IUT sends an HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester with State set to 0x00.

- Expected Outcome

Pass verdict

In Step 7, the IUT returns a 0x0C error code.

4.10.29 Reject LE Connection Rate Request when Connection_Interval_Max is Too Small

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Rate_Request command when the Connection_Interval_Max parameter is smaller than connIntervalRequired.

- Reference

[\[23\] 7.8.154](#)

[\[24\] 5.1.33](#)



- Initial Condition
 - The IUT is in the Peripheral role.
 - The IUT and the Lower Tester have a connection on the PHY specified in [Table 4.84](#) with a 10 ms connection interval.
 - The Lower Tester has initiated and completed a feature exchange procedure (with page 1) with the IUT before initiating SCI.
 - The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.
- Test Case Configuration

Test Case	PHY	DLE Supported
HCI/CCO/BI-143-C [Reject LE Connection Rate Request when Connection_Interval_Max is Too Small, LE 1M]	LE 1M	No
HCI/CCO/BI-144-C [Reject LE Connection Rate Request when Connection_Interval_Max is Too Small, LE 1M, DLE Supported]	LE 1M	Yes
HCI/CCO/BI-145-C [Reject LE Connection Rate Request when Connection_Interval_Max is Too Small, LE Coded]	LE Coded	No
HCI/CCO/BI-146-C [Reject LE Connection Rate Request when Connection_Interval_Max is Too Small, LE Coded, DLE Supported]	LE Coded	Yes

Table 4.84: Reject LE Connection Rate Request when Connection_Interval_Max is Too Small test cases

- Test Procedure
 1. If DLE is supported as specified in [Table 4.84](#), execute Step 1.
 - 1A. The Lower Tester sends an LL_LENGTH_REQ PDU to the IUT with the maximum values for MaxRxOctets, MaxRxTime, MaxTxOctets, and MaxTxTime for the PHY specified in [Table 4.84](#).
 - 1B. The IUT sends an LL_LENGTH_RSP PDU to the Lower Tester with MaxRxOctets, MaxRxTime, MaxTxOctets, and MaxTxTime.
 - 1C. If the values in either the LL_LENGTH_REQ or LL_LENGTH_RSP PDUs mean the connEffectiveMaxTxOctets, connEffectiveMaxRxOctets, connEffectiveMaxTxTime, or connEffectiveMaxRxTime have changed, the IUT sends an HCI_LE_Data_Length_Change event to the Upper Tester with Max_TX_Octets, Max_TX_Time, Max_RX_Octets, and Max_RX_Time.
 2. Perform either alternative 2A or 2B depending on DLE support specified in [Table 4.84](#).

Alternative 2A (DLE is supported):

 - 2A.1 The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT with Connection_Interval_Max set to a value one less than $T_IFS_ACL_CP + T_MCES + \min(\text{connEffectiveMaxRxTime}, ((\text{connEffectiveMaxRxOctets} \times 64) + 976))$.
 - 2A.2 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x11.

Alternative 2B (DLE is not supported):

 - 2B.1 The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT with Connection_Interval_Max set to one less than $T_IFS_ACL_CP + T_MCES + \text{connEffectiveMaxRxTime}$ where $\text{connEffectiveMaxRxTime} = 328 \text{ us}$ for the LE 1M PHY and $\text{connEffectiveMaxRxTime} = 2704 \text{ us}$ for the LE Coded PHY.

2B.2 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x11 or 0x20.

- Expected Outcome

Pass verdict

In Step 2A.2, the IUT returns a 0x11 error code.

In Step 2B.2, the IUT returns a 0x11 or 0x20 error code.

HCI/CCO/BI-147-C [Reject LE Connection Update command when Connection Parameters Request in progress]

- Test Purpose

Verify that the IUT rejects the HCI_LE_Connection_Update command when the IUT has a Connection Parameters Request in progress.

- Reference

[23] 7.8.18

- Initial Condition

- The IUT is in the Peripheral role.
- The IUT and the Lower Tester have a connection.
- The IUT and the Lower Tester have the Shorter Connection Intervals (Host Support) feature bit set.
- The Lower Tester has initiated and completed a Feature Exchange Procedure with the IUT with the Shorter Connection Intervals feature set in Page 1.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Connection_Rate_Request command to the IUT with Max_Latency set to 0x100.
2. The IUT sends an LL_CONNECTION_RATE_REQ PDU to the Lower Tester with Max_Latency set to 0x100.
3. The Lower Tester does not send the LL_CONNECTION_RATE_IND PDU to the IUT.
4. The Upper Tester sends an HCI_LE_Connection_Update command to the IUT with Max_Latency set to 0x101.
5. The IUT sends an HCI_Command_Status to the Upper Tester with Status set to 0x0C.
6. The Lower Tester sends an LL_CONNECTION_RATE_IND PDU to the IUT.
7. The IUT sends an HCI_LE_Connection_Rate_Change event with Status set to 0x00.

- Expected Outcome

Pass verdict

In Step 5, the IUT sends a 0x0C error.

In Step 7, the IUT sends a successful HCI event.

HCI/CCO/BI-148-C [Reject the LE CS Procedure Enable command if the Security Start procedure has not completed, Central]

- Test Purpose

Verify that a Central IUT that has a Security Start procedure in progress rejects an Upper Tester initiating an LE CS Procedure Enable command.

- Reference

[18] 5.1.23

- Initial Condition

- The IUT is in the Central role.
- Encrypted Connection: The IUT and the Lower Tester have an encrypted connection, exchanged capabilities, and set default settings, and have created a configuration.

- Test Procedure

1. The Upper Tester sends an HCI_LE_CS_Security_Enable command to the IUT.
2. The IUT sends a successful HCI_Command_Status event to the Upper Tester.
3. The IUT sends an LL_CS_SEC_REQ PDU to the Lower Tester.
4. The Lower Tester does not send an LL_CS_SEC_RSP PDU to the IUT.
5. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT.
6. The IUT sends an HCI_Command_Status event to the Upper Tester with Status > 0.
7. The Lower Tester sends an LL_CS_SEC_RSP PDU to the IUT.
8. The IUT sends a successful HCI_LE_CS_Security_Enable_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 6, the IUT sends an HCI_Command_Status event to the Upper Tester with a valid error code.

In Step 8, the IUT sends a successful event to the Upper Tester.

4.10.30 CS Set Security Requirements, Unsupported Feature

- Test Purpose

Verify that the CS Security Requirements command returns a 0x11 error when the IUT does not support the security parameter.

- Reference

[25] 7.8.157, 7.8.158

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection and have exchanged capabilities.

- Test Case Configuration

Test Case	Feature
HCI/CCO/BI-150-C [CS Set Security Requirements, Unsupported Feature, CS Tone]	CS tone
HCI/CCO/BI-151-C [CS Set Security Requirements, Unsupported Feature, 150 ns RTT]	150 ns RTT accuracy

Test Case	Feature
HCI/CCO/BI-152-C [CS Set Security Requirements, Unsupported Feature, 10 ns RTT]	10 ns RTT accuracy
HCI/CCO/BI-153-C [CS Set Security Requirements, Unsupported Feature, RTT Sounding or Random Sequence]	RTT Sounding or Random Sequence
HCI/CCO/BI-154-C [CS Set Security Requirements, Unsupported Feature, NADM]	NADM

Table 4.85: CS Set Security Requirements, Unsupported Feature test cases

- Test Procedure

Repeat the test steps for each round in [Table 4.86](#).

- The Upper Tester sends the HCI command specified in [Table 4.86](#) with the Feature specified in [Table 4.85](#).
- The IUT sends an HCI_Command_Complete event with Status set to 0x11.

Round	Command (Step 3)
1	LE CS Set Security Requirements
2	LE CS Set Default Security Requirements

Table 4.86: CS Set Security Requirements, Unsupported Feature rounds

- Expected Outcome

Pass verdict

In Step 2, the IUT sends a 0x11 error to the Upper Tester.

[HCI/CCO/BI-155-C \[LE CS Set Security Requirements, CS procedure in progress\]](#)

- Test Purpose

Verify that the IUT rejects the LE CS Set Security Requirements command when a CS procedure is in progress.

- Reference

[\[25\]](#) 7.8.157

- Initial Condition

- The IUT and the Lower Tester have an encrypted connection, read the remote FAE, exchanged capabilities, executed the CS Security procedure, and set default settings.

- Test Procedure

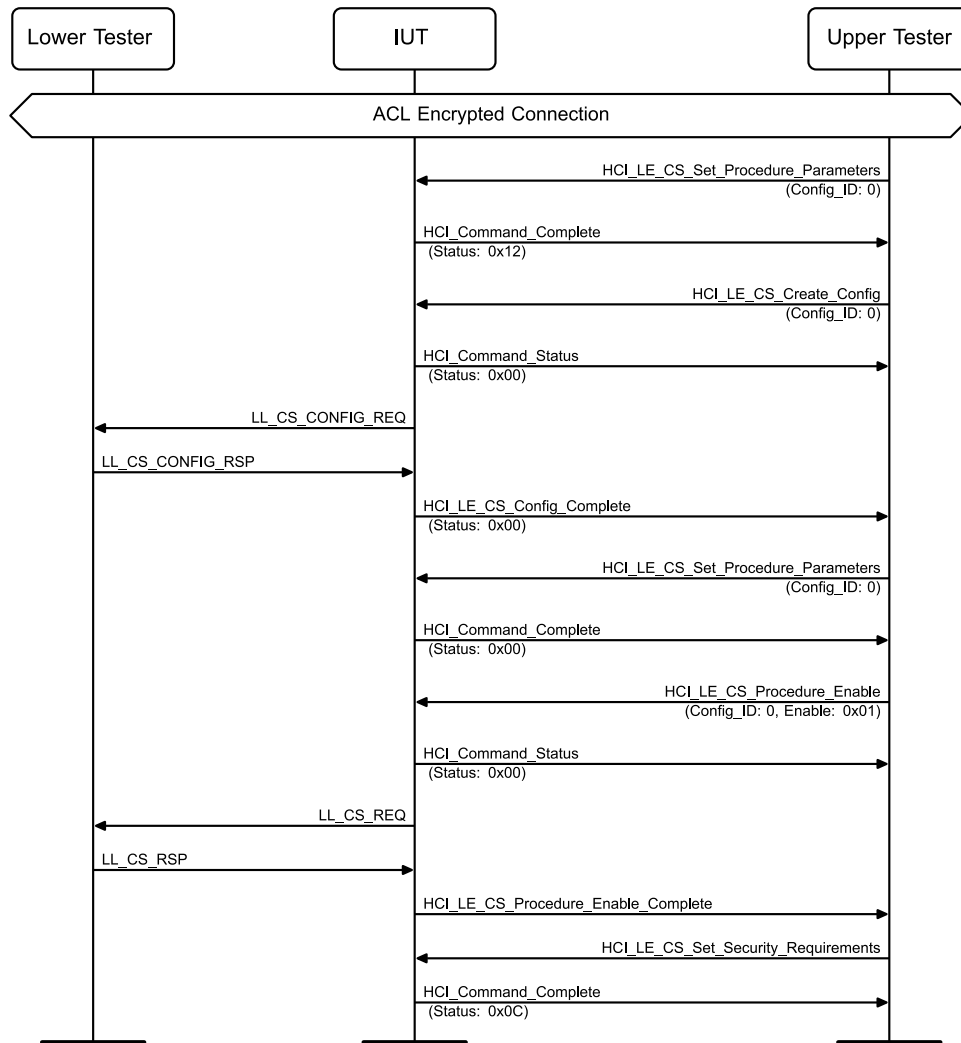


Figure 4.118: LE CS Set Security Requirements, CS procedure in progress MSC

1. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with parameters set to valid values and Config_ID set to 0.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x12 (Invalid HCI Command Parameters).
3. The Upper Tester sends an HCI_LE_CS_Create_Config command to the IUT with parameters set to valid values and Config_ID set to 0 and receives a successful HCI_Command_Status in response.
4. The IUT and the Lower Tester complete the CS configuration procedure.
5. The IUT sends a successful HCI_LE_CS_Config_Complete event in response.
6. The Upper Tester sends an HCI_LE_CS_Set_Procedure_Parameters command to the IUT with Config_ID set to 0 and receives a successful HCI_Command_Complete event in response.
7. The Upper Tester sends an HCI_LE_CS_Procedure_Enable command to the IUT with Config_ID set to 0 and Enable set to 0x01.
8. The IUT sends a successful HCI_Command_Status event in response.
9. The IUT sends an LL_CS_REQ PDU to the Lower Tester.
10. The Lower Tester sends an LL_CS_RSP PDU to the IUT.

11. The IUT sends a successful HCI_LE_CS_Procedure_Enable_Complete event to the Upper Tester.
12. The Upper Tester sends an HCI_LE_CS_Set_Security_Requirements command to the IUT.
13. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Step 13, the IUT sends a 0x0C error to the Upper Tester.

4.11 Controller Setup

HCI/CSE/BV-01-C [Logical Link Cancel Command]

- Test Purpose

Verify that the Logical Link Cancel command does cancel a Create Logical Link command before the logical link is totally established.

- Reference

[1] 7.1.40, 7.1.43

- Initial Condition

- The IUT is the initiator.

- Test Procedure

The Upper Tester sends Create Logical Link command to the IUT.

The Upper Tester receives command status event with success.

The Upper Tester sends Logical Link Cancel command right away.

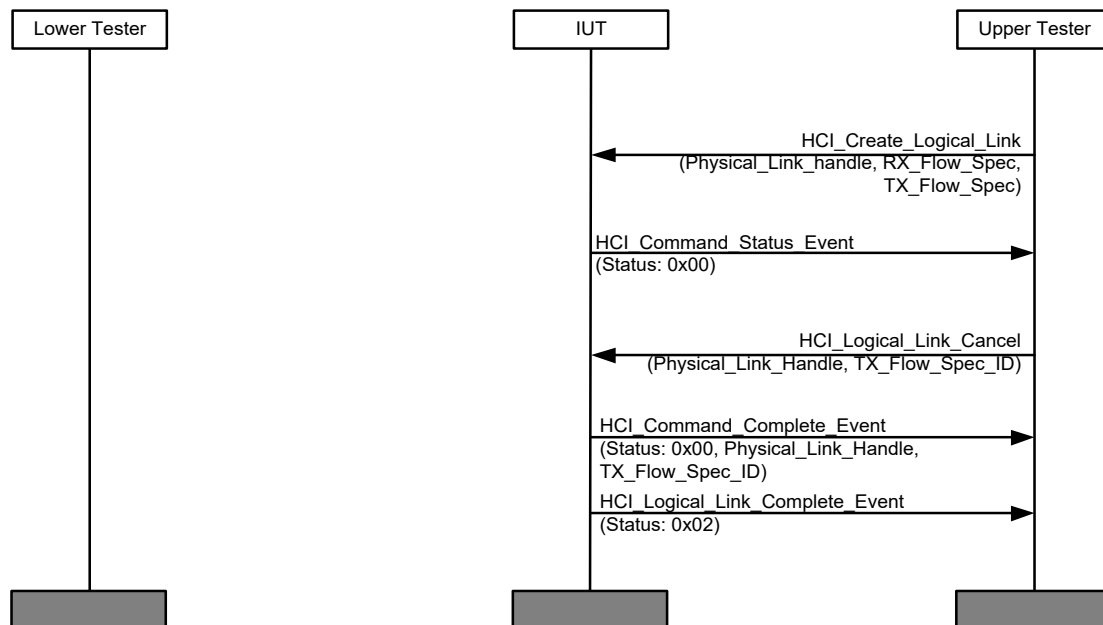


Figure 4.119: HCI/CSE/BV-01-C [Logical Link Cancel Command] MSC

- Expected Outcome

Pass verdict

Command Complete event for Logical Link Cancel is received by the Upper Tester.

Logical Link Complete event with error code Unknown Connection Identifier (0x02) is received by the Upper Tester.

HCI/CSE/BV-02-C [Logical Link Cancel Command]

- Test Purpose

Verify that the Logical Link Cancel command does cancel a Create Logical Link command before the logical link is totally established.

- Reference

[1] 7.1.41, 7.1.43

- Initial Condition

- The IUT is the responder and it has received Accept Logical Link Request command.

- Test Procedure

The Upper Tester sends Accept Logical Link command to the IUT.

The Upper Tester receives command status event with success.

The Upper Tester sends Logical Link Cancel command right away.

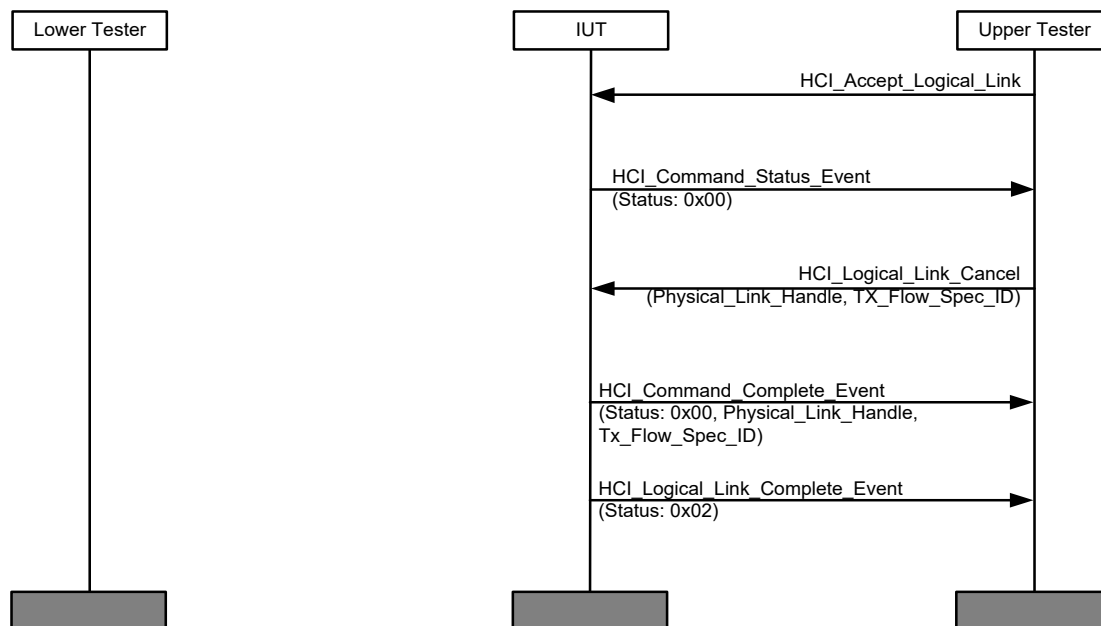


Figure 4.120: HCI/CSE/BV-02-C: [Logical Link Cancel Command] MSC

- Expected Outcome

Pass verdict

Command Complete event for Logical Link Cancel is received by the Upper Tester.

Logical Link Complete event with error code Unknown Connection Identifier (0x02) is received by the Upper Tester.

HCI/CSE/BI-03-C [Logical Link Cancel Command]

- Test Purpose

Verify that the Logical Link Cancel command is handled correctly after the logical link has been established already.

- Reference

[1] 7.1.43

- Initial Condition

- The IUT and the Lower Tester have a Logical Link established already.

- Test Procedure

The Upper Tester sends Logical Link Cancel command to the IUT.

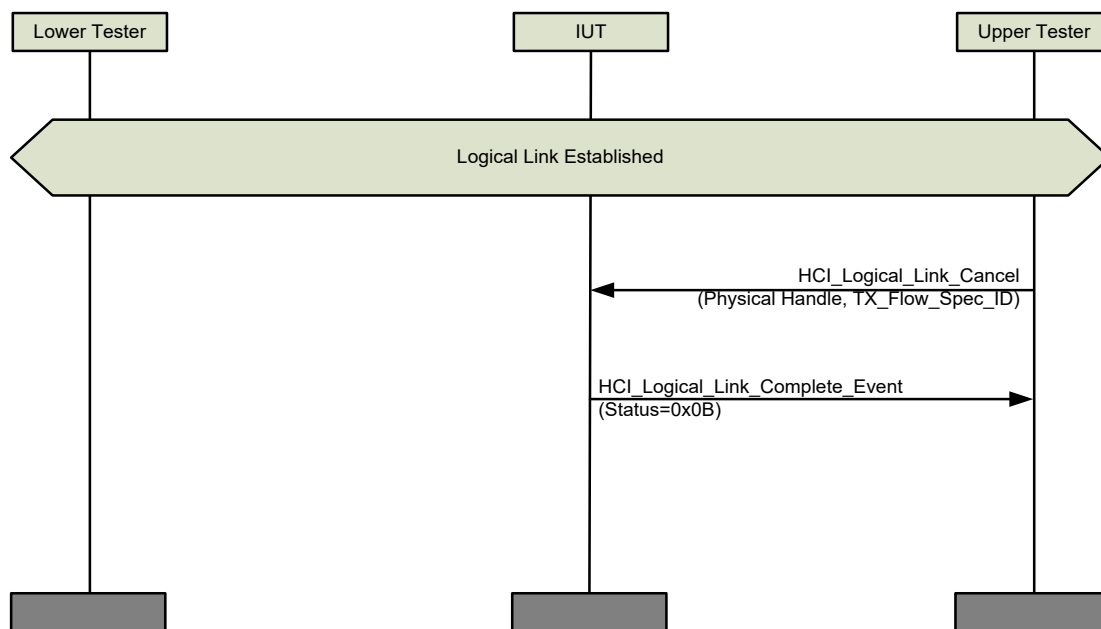


Figure 4.121: HCI/CSE/BI-03-C [Logical Link Cancel Command] MSC

- Expected Outcome

Pass verdict

Command Complete event for Logical Link Cancel is received by the Upper Tester with error code ACL Connection Already Exists (0x0B).

HCI/CSE/BI-04-C [Logical Link Cancel Command]

- Test Purpose

Verify that the Logical Link Cancel command is handled correctly if there is no logical link or an invalid logical link handle is given.

- Reference

[1] HCI 7.1.43

- Initial Condition
 - The IUT and the Lower Tester do not have any Logical Links established.
- Test Procedure

The Upper Tester sends Logical Link Cancel command to the IUT.

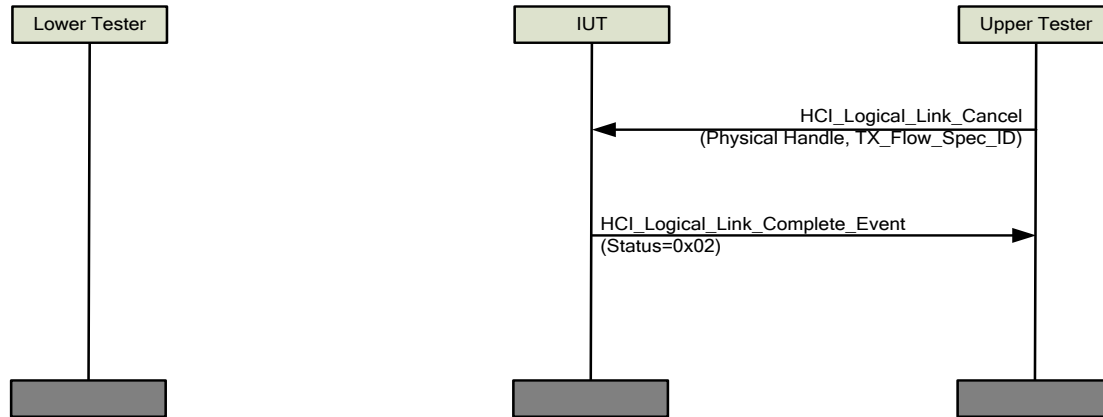


Figure 4.122: HCI/CSE/BI-04-C [Logical Link Cancel Command] MSC

- Expected Outcome

Pass verdict

Command Complete event for Logical Link Cancel is received by the Upper Tester with error code Unknown Connection Identifier (0x02).

HCI/CSE/BV-05-C [Write Logical Link Accept Timeout Command/Read Logical Link Accept Timeout Command]

- Test Purpose

Verify that the Write Logical Link Accept Timeout Command and Read Logical Link Accept Timeout Command are handled correctly by the IUT.
- Reference

[1] 7.3.15, 7.3.16
- Initial Condition
 - The IUT is in standby.
- Test Procedure

The Upper Tester issues Write Logical Link Accept Timeout Command with preset information to the IUT.

The Upper Tester receives success status in the Write Logical Link Accept Timeout Command complete event.

The Upper Tester issues Read Logical Link Accept Timeout Command with preset information to the IUT.

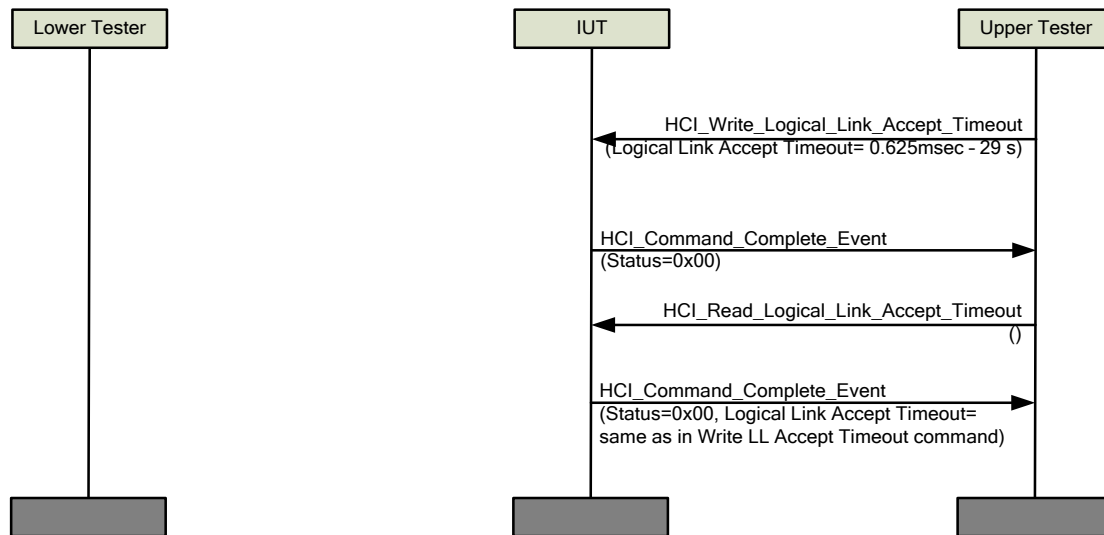


Figure 4.123: HCI/CSE/BV-05-C [Write Logical Link Accept Timeout Command/Read Logical Link Accept Timeout Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives command complete event with success status for two commands. The Upper Tester receives the data returned by the Read Logical Link Accept Timeout Command complete event. The received data matches that was used in the Write Logical Link Accept Timeout Command.

HCI/CSE/BV-06-C [Verify Truncated Paging]

- Test Purpose

Verify that the Truncated Page command configures the IUT to perform a Truncated Page procedure.
Verify that the IUT generates Truncated Page Complete event.

- Reference

[1] 7.1, 7.7

- Initial Condition

- The IUT is in Standby.
- The Lower Tester is performing R1 Interlaced Scans.

- Test Procedure

The Upper Tester sends HCI Truncated Page command to the IUT and receives HCI Command Status pending.

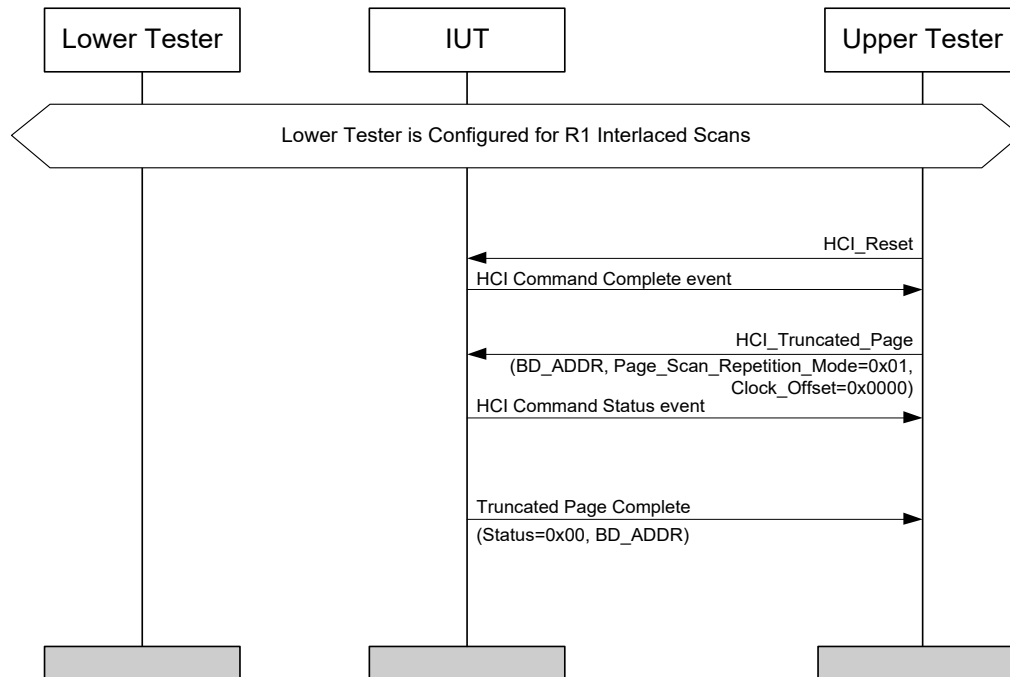


Figure 4.124: HCI/CSE/BV-06-C [Verify Truncated Paging] MSC

- Expected Outcome

Pass verdict

The IUT performs a Truncated Page procedure on the Lower Tester AND

The IUT generates a Truncated Page Complete event with Status = Success.

HCI/CSE/BV-07-C [Page Response Timeout Detection]

- Test Purpose

Verify that the IUT generates a Page Response Timeout event.

- Reference

[1] 7.7

- Initial Condition

- The IUT is configured for R1 Page Scans.
- The Lower Tester is in Standby.

- Test Procedure

The Lower Tester performs Truncated Paging on the IUT.

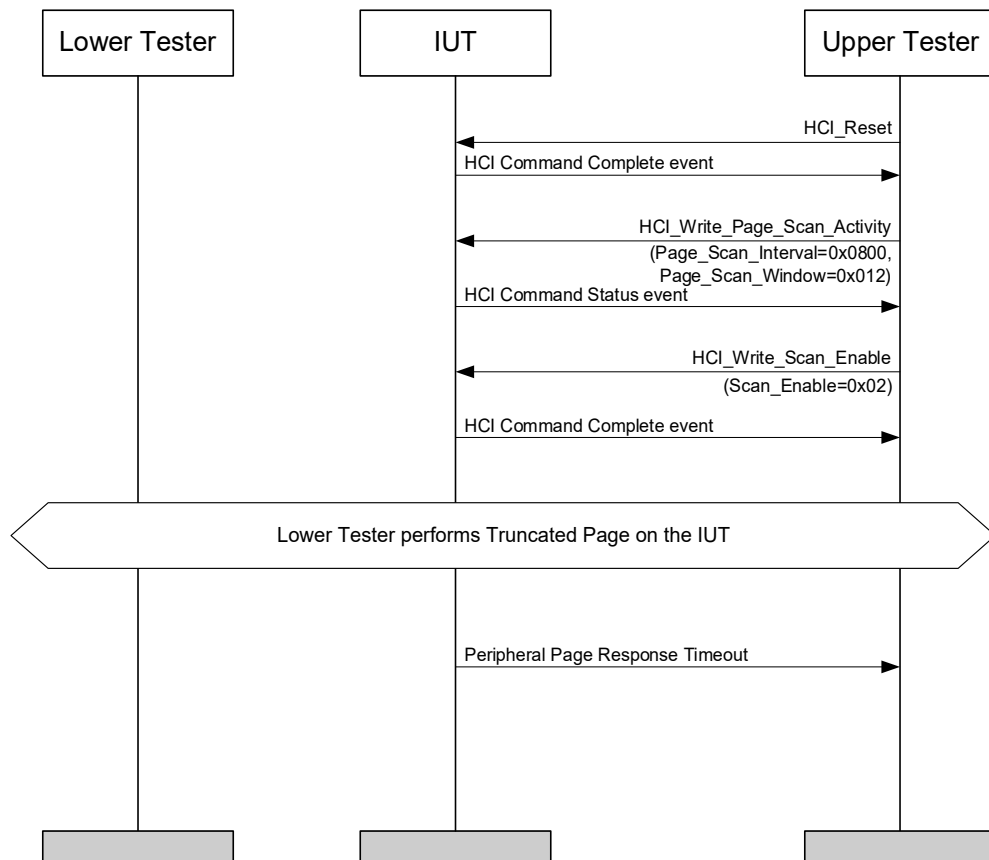


Figure 4.125: HCI/CSE/BV-07-C [Page Response Timeout Detection] MSC

- Expected Outcome

Pass verdict

The IUT generates a Page Response Timeout event.

HCI/CSE/BV-08-C [LE Set Host Feature Command During Connection, Initiator]

- Test Purpose

Verify that the Initiator IUT returns an error when the Upper Tester sends an HCI_LE_Set_Host_Feature command after a connection is completed with the Lower Tester.

- Reference

[13] 7.8.115

- Initial Condition

- The IUT is the Initiator.

- Test Procedure

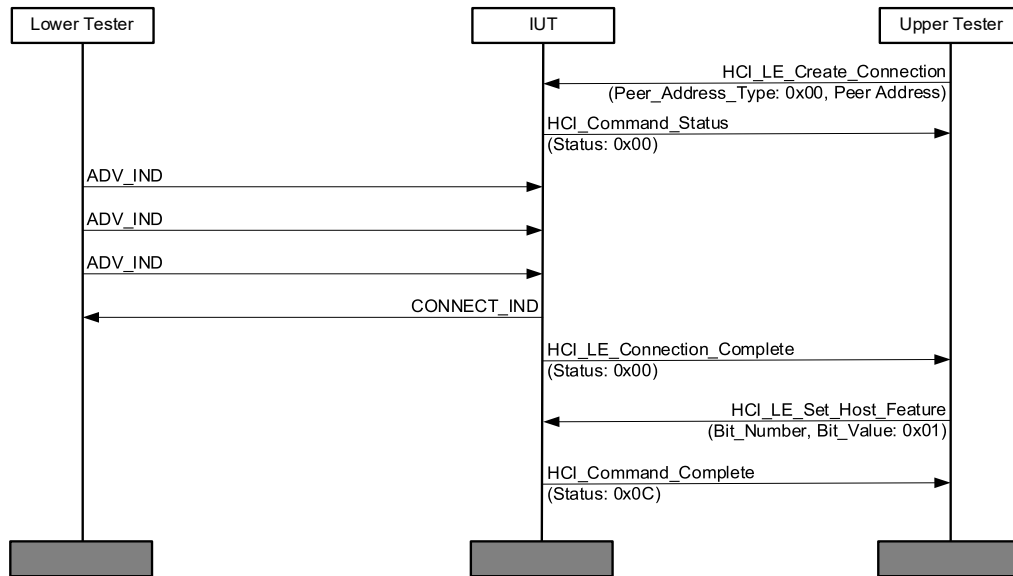


Figure 4.126: HCI/CSE/BV-08-C [LE Set Host Feature Command During Connection, Initiator] MSC

1. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT with Peer_Address_Type set to 0x00 and Peer_Address set to the Lower Tester's public address, and it receives a successful HCI_Command_Status event in return.
2. The Lower Tester is configured to start advertising with a public address.
3. After receiving an ADV_IND PDU from the Lower Tester, the IUT sends a CONNECT_IND PDU to the Lower Tester with InitA set to the IUT public address.
4. The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester.
5. The Upper Tester sends an HCI_LE_Set_Host_Feature command with Bit_Number set to a supported feature bit and Bit_Value set to 0x01.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

HCI/CSE/BV-09-C [LE Set Host Feature Command During Connection, Advertiser]

- Test Purpose

Verify that the Advertiser IUT returns an error when the Upper Tester sends an HCI_LE_Set_Host_Feature command after a connection is completed with the Lower Tester.

- Reference

[13] 7.8.115

- Initial Condition

- The IUT is the Advertiser.

- Test Procedure

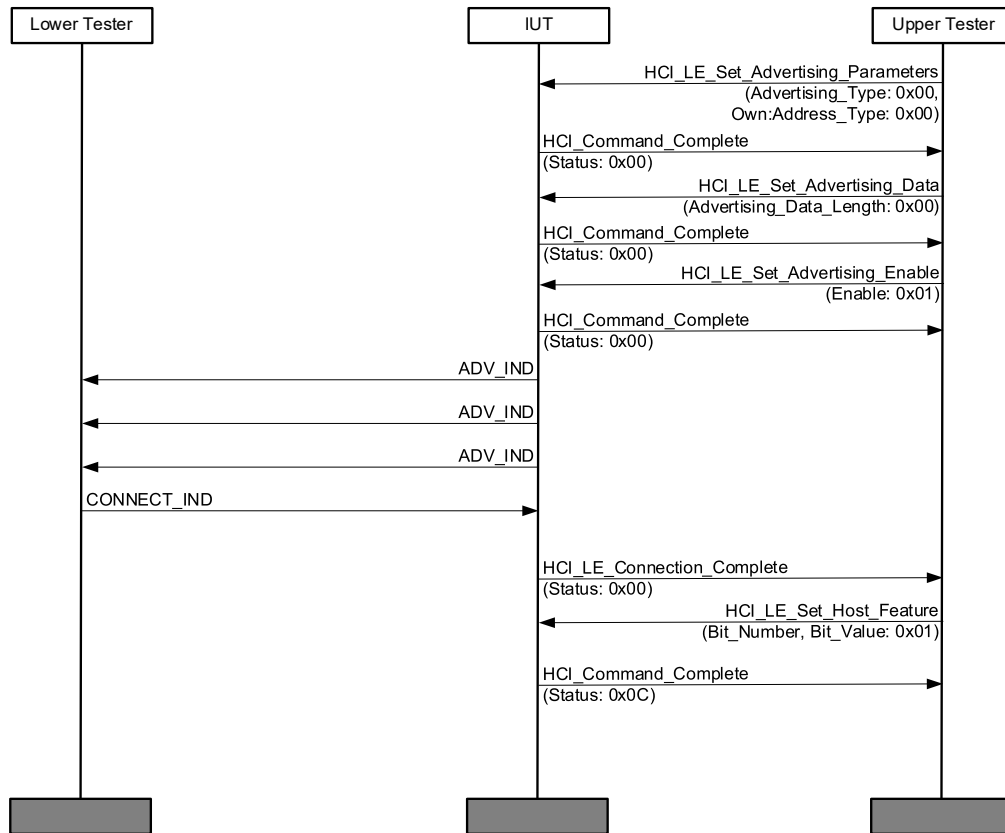


Figure 4.127: HCI/CSE/BV-09-C [LE Set Host Feature Command During Connection, Advertiser] MSC

1. The Upper Tester sends an HCI_LE_Set_Advertising_Parameters command to the IUT with Advertising_Type set to 0x00 and Own_Address_Type set to 0x00, and it receives a successful HCI_Command_Complete event in return.
2. The Upper Tester sends an HCI_LE_Set_Advertising_Data command to the IUT with Advertising_Data_Length set to 0, and it receives a successful HCI_Command_Complete event in return.
3. The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT with Enable set to 0x01, and it receives a successful HCI_Command_Complete event in return.
4. After receiving an ADV_IND PDU, the Lower Tester sends a CONNECT_IND PDU to the IUT with InitA set to the Lower Tester public address.
5. The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester.
6. The Upper Tester sends an HCI_LE_Set_Host_Feature command with Bit_Number set to a supported feature bit and Bit_Value set to 0x01.
7. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Step 7, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

4.12 Connectionless Peripheral Broadcast

Verify the correct implementation of Connectionless Peripheral Broadcast commands and events.

Verify the correct implementation of Synchronization Train commands and events.

Verify the correct implementation of Truncated Page commands and events.

HCI/CPB/BV-01-C [Connectionless Peripheral Broadcast Transmission]

- Test Purpose

Verify that:

- The Set Reserved *LT_ADDR* command reserves the correct *LT_ADDR* on the IUT for Connectionless Broadcast.
- The Write Synchronization Train Parameters command configures Synchronization Train parameters on the IUT.
- The Read Synchronization Train Parameters command retrieves previously configured Synchronization Train parameters from the IUT.
- The Set Connectionless Peripheral Broadcast Data command correctly configures the IUT to transmit the provided data.
- The Set Connectionless Peripheral Broadcast command correctly configures the IUT to transmit Connectionless Broadcast packets.
- The Start Synchronization Train command starts the Synchronization Train on the IUT.
- The IUT sends a Synchronization Train Complete event to the Upper Tester after the Synchronization train completes after the configured time.

- Reference

[1] 7.1, 7.3, 7.7

- Initial Condition

- The IUT is in Standby.

- Test Procedure

1. The Upper Tester sends HCI Set Reserved *LT_ADDR* command to the IUT and receives HCI Command Complete with Status = Success.
2. The Upper Tester sends HCI Write Synchronization Train parameters and receives HCI Command Complete with Status = Success.
3. The Upper Tester sends HCI Read Synchronization Train parameters and receives HCI Command Complete with Status = Success and Synchronization Train parameters that match the values set in Step 2.
4. The Upper Tester sends HCI Set Connectionless Broadcast Data command to the IUT and receives HCI Command Complete with Status = Success.
5. The Upper Tester sends HCI Set Connectionless Broadcast command to the IUT and receives HCI Command Complete with Status = Success.
6. The Upper Tester sends HCI Start Synchronization Train command to the IUT and receives HCI Command Complete with Status = Success.

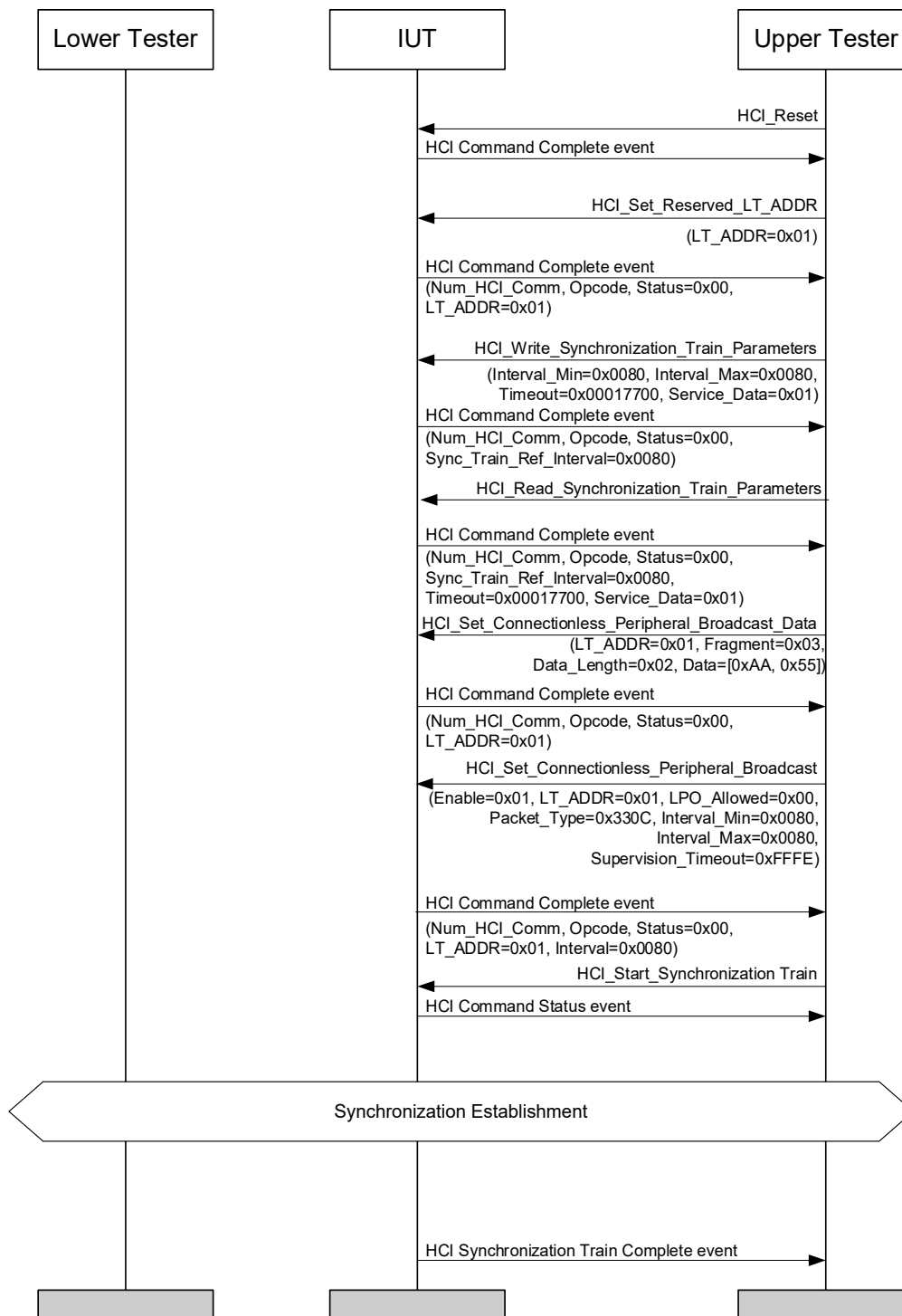


Figure 4.128: HCI/CPB/BV-01-C [Connectionless Peripheral Broadcast Transmission] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Set Reserved LT ADDR command AND

The IUT returns 'command complete' succeeded to the Write Synchronization Train Parameters command AND

The IUT returns 'command complete' succeeded with the previously configured Synchronization Train parameters as a result of the Read Synchronization Train Parameters command AND

The IUT returns 'command complete' succeeded to the Set Connectionless Peripheral Broadcast Data command AND

The IUT returns 'command complete' succeeded to the Set Connectionless Peripheral Broadcast command AND

The IUT returns 'command status' pending to the Start Synchronization Train command AND

The Lower Tester successfully synchronizes to the IUT AND

The Lower Tester successfully receives broadcast data AND

The IUT returns 'synchronization train complete' event after the configured Synchronization Train duration.

HCI/CPB/BV-02-C [Delete Reserved LT ADDR]

- Test Purpose

Verify that the Delete Reserved LT ADDR command cancels the reservation of a specific LT_ADDR.

- Reference

[1] 7.3

- Initial Condition

- The IUT is in Standby.

- Test Procedure

The Upper Tester sends HCI Set Reserved LT_ADDR command to the IUT and receives HCI Command Complete with Status = Success.

The Upper Tester sends HCI Delete Reserved LT_ADDR command and receives HCI Command Complete with Status = Success.

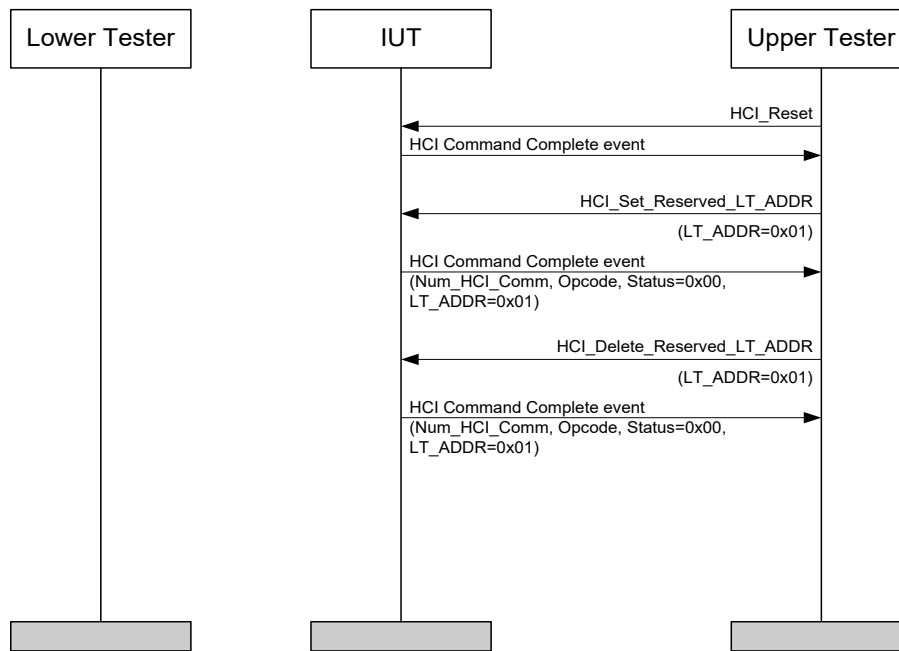


Figure 4.129: HCI/CPB/BV-02-C [Delete Reserved LT ADDR] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Set Reserved LT_ADDR command AND

The IUT returns 'command complete' succeeded to the Delete Reserved LT_ADDR command.

HCI/CPB/BV-03-C [CPB Channel Map Change Event]

- Test Purpose

Verify that the IUT generates a Connectionless Peripheral Broadcast Channel Map Change event when the channel map for Connectionless Peripheral Broadcast changes.

- Reference

[1] 7.7

- Initial Condition

- The IUT is in Standby.

- Test Procedure

The Upper Tester sends HCI Set Reserved LT_ADDR command to the IUT and receives HCI Command Complete with Status = Success.

The Upper Tester sends HCI Write Synchronization Train parameters and receives HCI Command Complete with Status = Success.

The Upper Tester sends Set AFH Host Channel Classification command and receives HCI Command Complete with Status = Success.

The Upper Tester sends HCI Set Connectionless Broadcast command to the IUT and receives HCI Command Complete with Status = Success.

The Upper Tester sends Set AFH Host Channel Classification command and receives HCI Command Complete with Status = Success.

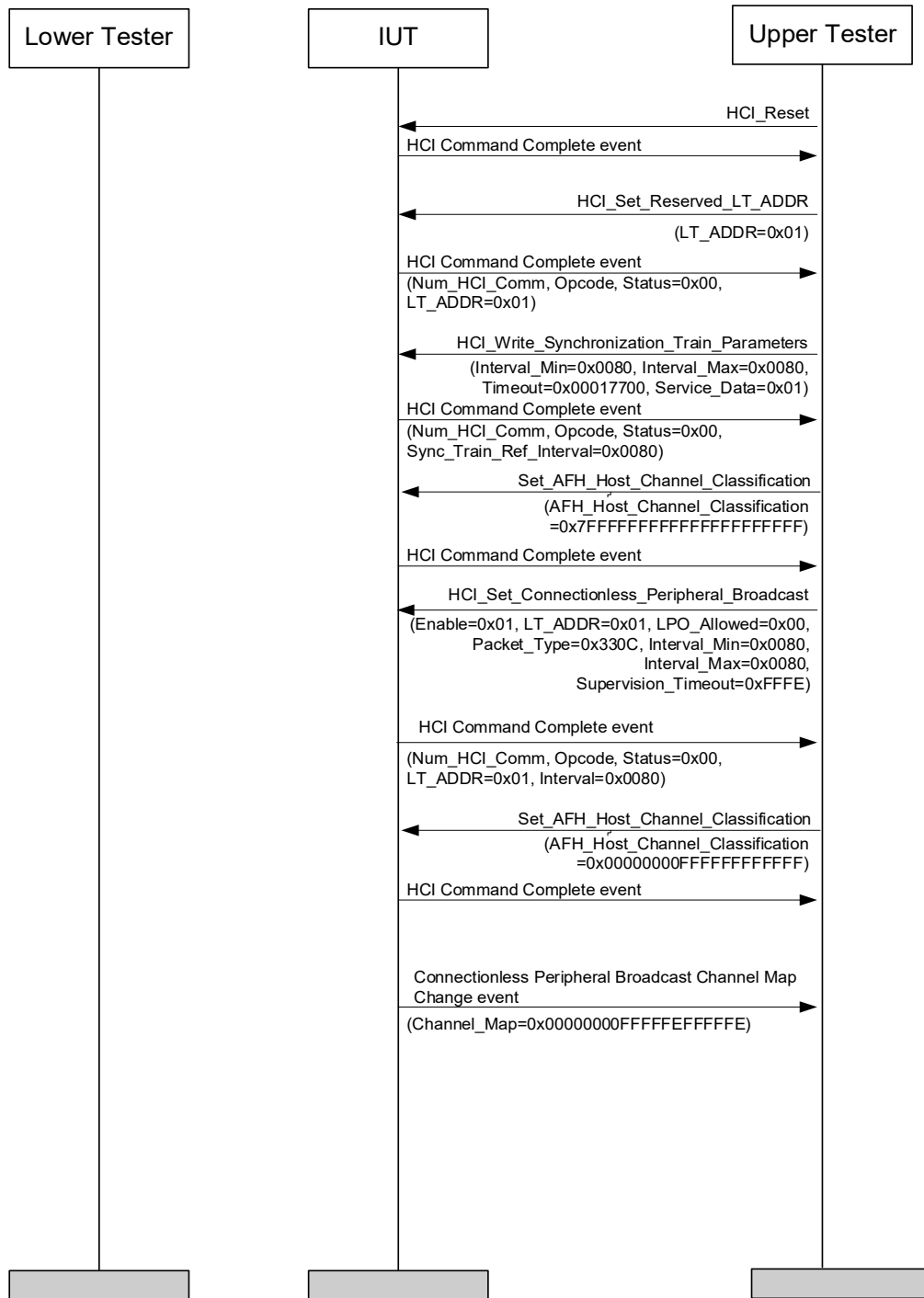


Figure 4.130: HCI/CPB/BV-03-C [CPB Channel Map Change Event] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command complete' succeeded to the Set Reserved LT ADDR command AND

The IUT returns 'command complete' succeeded to the Write Synchronization Train Parameters command AND

The IUT returns 'command complete' succeeded to the Set AFH Host Channel Classification command AND

The IUT returns 'command complete' succeeded to the Set Connectionless Peripheral Broadcast command AND

The IUT returns 'command complete' succeeded to the Set AFH Host Channel Classification command AND

The IUT generate a Connectionless Peripheral Broadcast Channel Map change event with the channel map from the previous Set AFH Host Channel Classification command.

HCI/CPB/BV-04-C [Connectionless Peripheral Broadcast Reception]

- Test Purpose

Verify that:

- The Receive Synchronization Train command configures the IUT to receive Synchronization Train
- The IUT generates Synchronization Train Received events
- The Set Connectionless Peripheral Broadcast Receive command configures the IUT to receive Connectionless Peripheral Broadcast packets
- The IUT generates Connectionless Broadcast Receive events

- Reference

[1] 7.1, 7.3, 7.7

- Initial Condition

- The IUT is in Standby.
- The Lower Tester is transmitting Connectionless Peripheral Broadcast packets using the following parameters:
 - LT_ADDR: 1
 - LPO_Allowed: 0 (No)
 - Packet_Type: 0x330E (only DM1 packets allowed)
 - Interval: 0x0080 (80 ms)
 - Data_Length = 0x02
 - Data = [0xAA, 0x55]
- The Lower Tester is transmitting Synchronization Train continuously with an interval of 0x0080.

- Test Procedure

The Upper Tester sends HCI Receive Synchronization Train command to the IUT and receives HCI Command Status pending.

The IUT generates a Synchronization Train Received event.

The Upper Tester uses the parameters from the Synchronization Train Received event to send the HCI Set Connectionless Broadcast Receive command and receives HCI Command Complete with Status = Success.

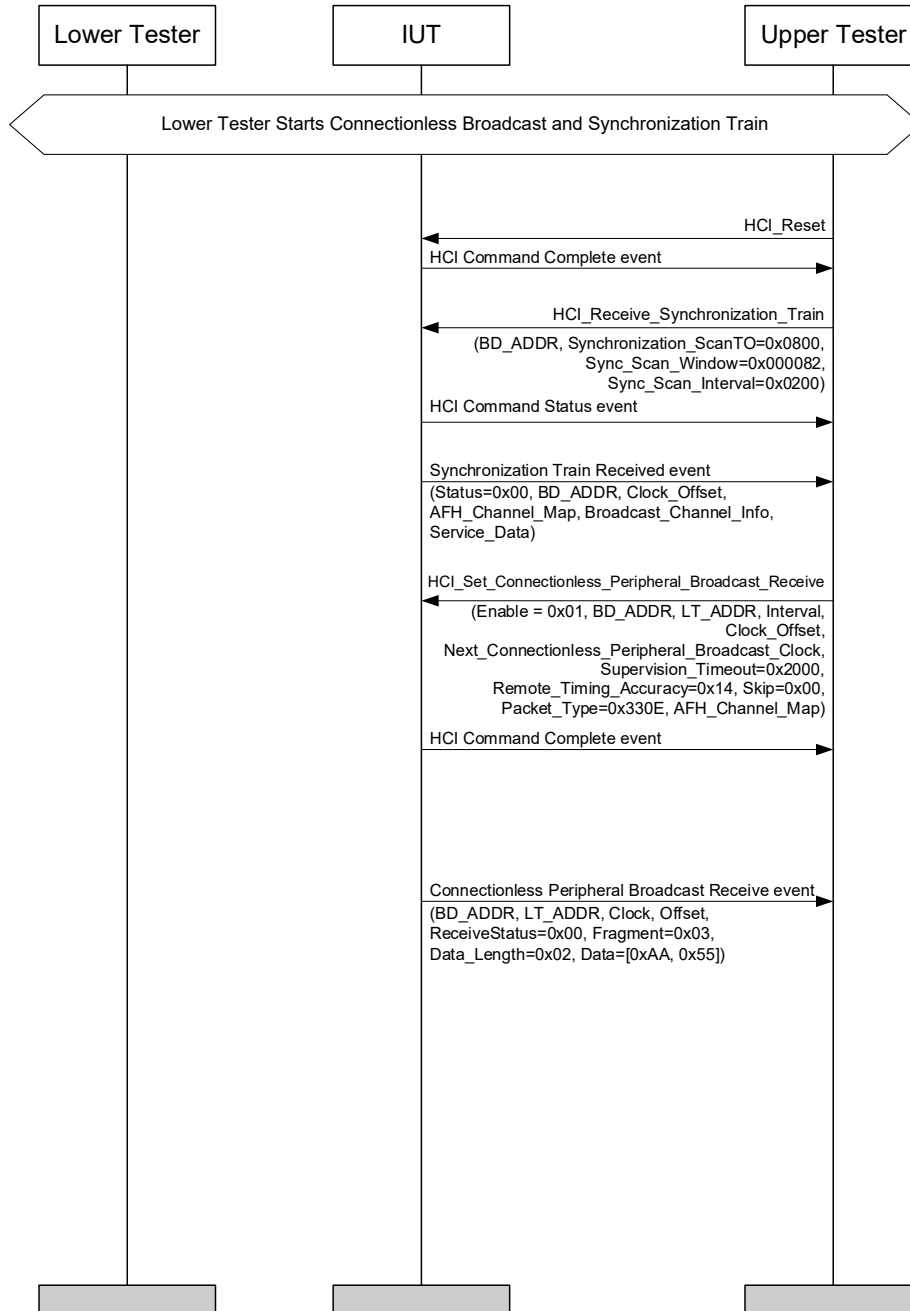


Figure 4.131: HCI/CPB/BV-04-C [Connectionless Peripheral Broadcast Reception] MSC

- Expected Outcome

Pass verdict

The IUT returns 'command status' pending to the Receive Synchronization Train command AND

The IUT generates a Synchronization Train Received event AND

The IUT generates Connectionless Peripheral Broadcast Receive events with data transmitted by the Lower Tester.

HCI/CPB/BV-05-C [Connectionless Peripheral Broadcast Reception Timeout]

- Test Purpose

Verify that the IUT generates Connectionless Peripheral Broadcast Timeout event.

- Reference

[1] 7.7

- Initial Condition

- The IUT is in Standby.
- The Lower Tester is transmitting Connectionless Peripheral Broadcast packets using the following parameters:
 - LT_ADDR: 1
 - LPO_Allowed: 0 (No)
 - Packet_Type: 0x330E (only DM1 packets allowed)
 - Interval: 0x0080 (80 ms)
 - Data_Length = 0x02
 - Data = [0xAA, 0x55]
- The Lower Tester is transmitting Synchronization Train continuously with an interval of 0x0080.

- Test Procedure

The Upper Tester sends HCI Receive Synchronization Train command to the IUT and receives HCI Command Status pending.

The IUT generates a Synchronization Train Received event.

The Upper Tester uses the parameters from the Synchronization Train Received event to send the HCI Set Connectionless Broadcast Receive command and receives HCI Command Complete with Status = Success.

The IUT generates Connectionless Peripheral Broadcast Receive events.

Stop Connectionless Peripheral Broadcast from the Lower Tester.

The IUT generates Connectionless Peripheral Broadcast Timeout after the configured timeout period has expired.

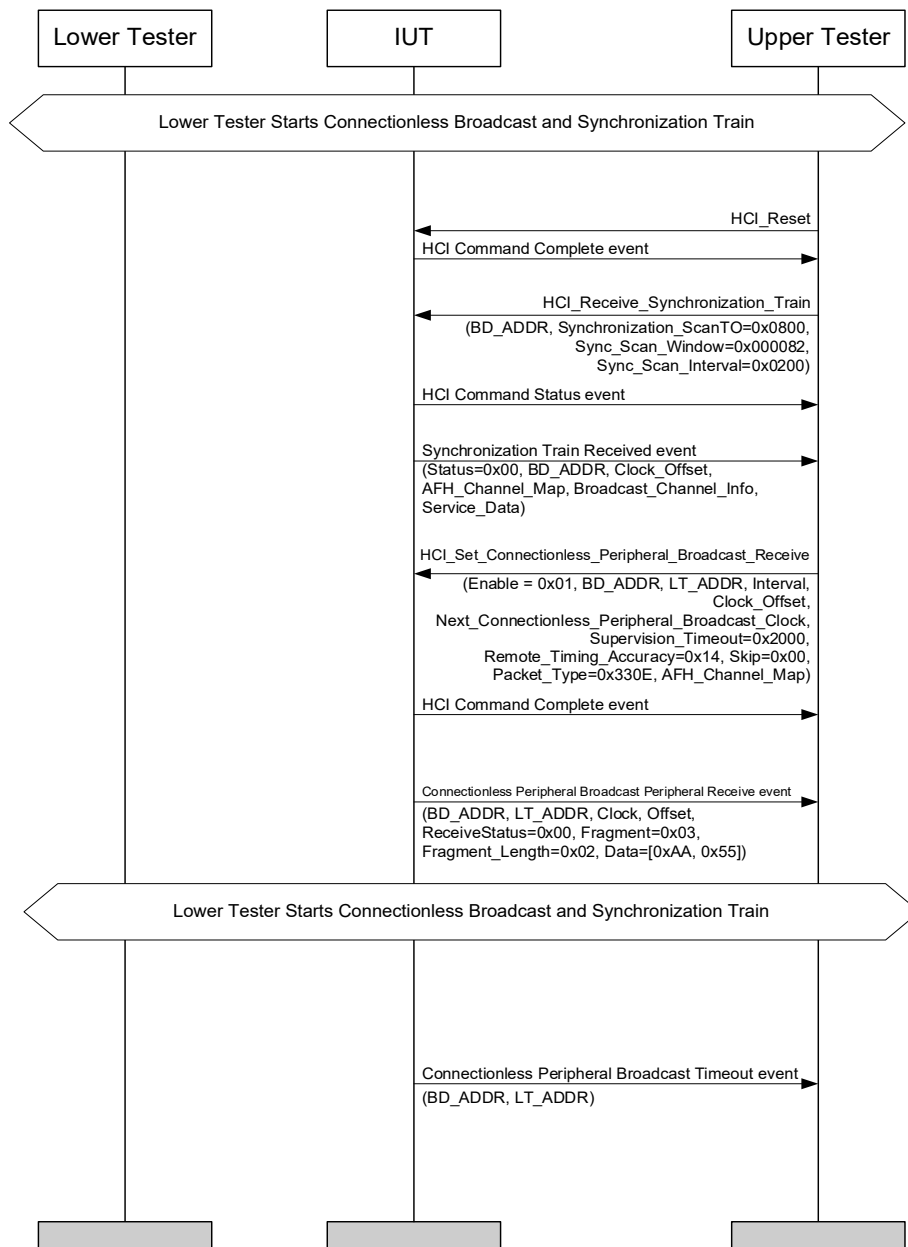


Figure 4.132: HCI/CPB/BV-05-C [Connectionless Peripheral Broadcast Reception Timeout] MSC

- Expected Outcome

Pass verdict

The IUT generates Connectionless Peripheral Broadcast Timeout event.

4.13 LE Connection Management

HCI/CM/BV-01-C [LE Read Peer Resolvable Address Command – Central]

- Test Purpose

Verify that the IUT correctly handles the LE Read Peer Resolvable Address Command.

- Reference

[8] 7.8.42

- Initial Condition

- The IUT is Central.

- Test Procedure

The Upper Tester populates the resolving list with the device identity of the Lower Tester, and its own device identity. The IUT uses this when generating a resolvable private address for the connection establishment.

The Upper Tester enables resolving list.

Configure the Lower Tester to initiate a connection while using directed advertisement with resolvable private addresses.

The Upper Tester commands the IUT to create a connection to the Lower Tester.

The IUT sends an LE Enhanced Connection Complete Event.

The Upper Tester issues a LE Read Peer Resolvable Address Command, with the identity address of the Lower Tester.

The Upper Tester receives a Command Complete event from the IUT for the LE Read Peer Resolvable Address Command with the Lower Tester's resolvable address.

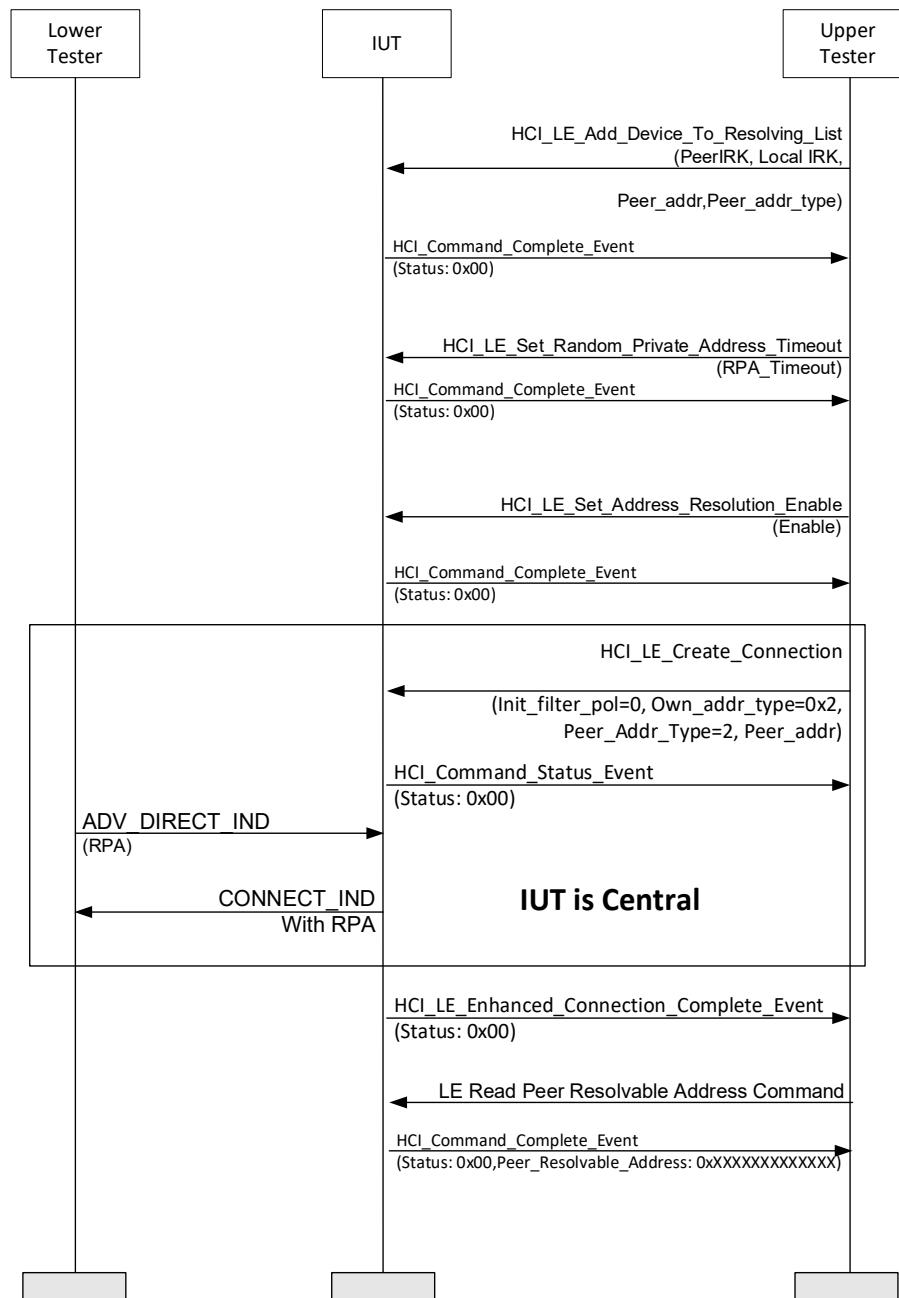


Figure 4.133: HCI/CM/BV-01-C [LE Read Peer Resolvable Address Command – Central] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status=0x00 (Success) and Peer_resolvable_address=0xFFFFFFFFXXXX.

The received resolvable address is identical with the Peer_Resolvable_Private_Address received in the enhanced connection complete event.

HCI/CM/BV-02-C [LE Read Local Resolvable Address Command – Central]

- Test Purpose

Verify that the IUT correctly handles the LE Read Local Resolvable Address Command

- Reference

[8] 7.8.43

- Initial Condition

- The IUT is Central.

- Test Procedure

The Upper Tester populates the resolving list with the device identity of the Lower Tester, and its own device identity. The IUT uses this when generating a resolvable private address for the connection establishment.

The Upper Tester enables resolving list.

Configure the Lower Tester to initiate a connection while using directed advertisement with resolvable private addresses.

The Upper Tester command the IUT to create a connection to the Lower Tester.

The IUT sends an LE Enhanced Connection Complete Event.

The Upper Tester issues a LE Local Peer Resolvable Address Command, with the identity address of the Lower Tester.

The Upper Tester receives a Command Complete event from the IUT for the LE Local Peer Resolvable Address Command with the local resolvable address.

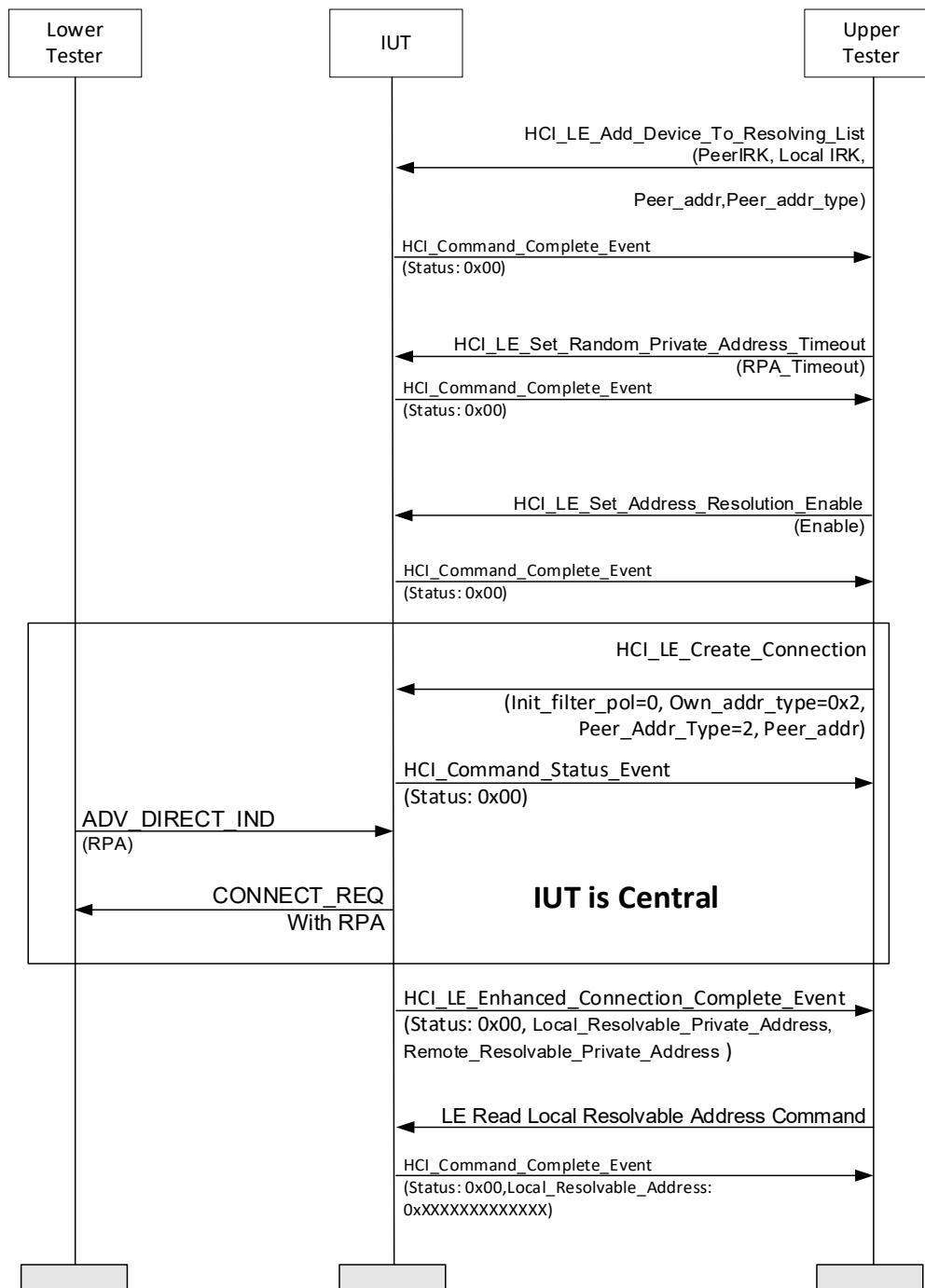


Figure 4.134: HCI/CM/BV-02-C [LE Read Local Resolvable Address Command – Central] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status=0x00 (Success) and Local_Resolvable_Address=0xxxxxxxxxxxxxx.

The received resolvable address is identical with the Local_Resolvable_Private_Address received in the enhanced connection complete event.

HCI/CM/BV-03-C [LE Read PHY Command]

- Test Purpose

Verify that the IUT correctly handles the LE Read PHY Command.

- Reference

[9] 7.8.47

- Initial Condition

- LL connection established, the IUT is Central or Peripheral.

- Test Procedure

The Upper Tester issues an LE Read PHY command to the IUT containing the current connection handle.

The Upper Tester receives a Command Complete event from the IUT for the LE Read PHY command containing the connection handle and with values for TX_PHY and RX_PHY that match the current PHY for the active connection.

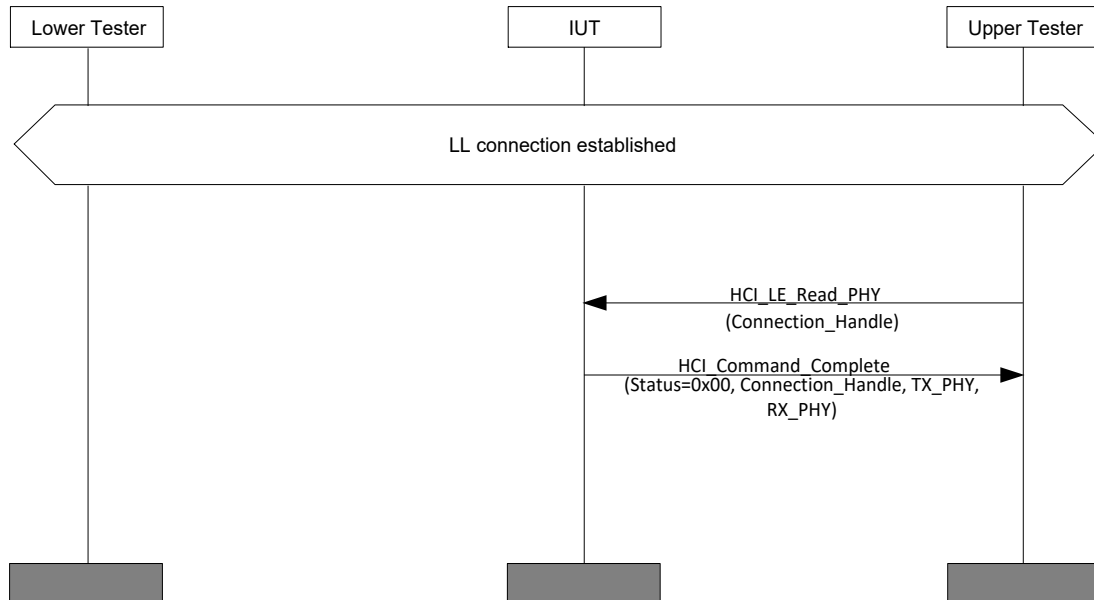


Figure 4.135: HCI/CM/BV-03-C [LE Read PHY Command] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) and with the value for Connection_Handle matching the value sent in the LE Read PHY Command.

The TX_PHY and RX_PHY fields contain values which match the PHY selected for the current active connection.

HCI/CM/BV-04-C [Extended Scanning with Device Privacy, RPA Timeout During Connection Initiation]

- Test Purpose

Verify that when the IUT is initiator and an RPA Timeout occurs between the IUT issuing an AUX_CONNECT_REQ PDU and the Lower Tester responding with an AUX_CONNECT_RSP PDU, the HCI_LE_Enhanced_Connection_Complete event returns the latest Peer_Address, Peer_Resolvable_Private_Address, and Local_Resolvable_Private_Address sent and received over the air.

- Reference

[11] 7.7.65.10

- Initial Condition

- The Lower Tester has previously distributed its IRK to the IUT.
- The IUT has previously distributed its IRK to the Lower Tester.
- The Lower Tester has added the IUT to its resolving list and sets the entry for device privacy mode.
- The IUT has added the Lower Tester to its resolving list and sets the entry for device privacy mode.
- Device privacy mode is enabled on the IUT and the Lower Tester.
- The Lower Tester is using its Identity Address in the AdvA field of the advertisement packets.

- Test Procedure

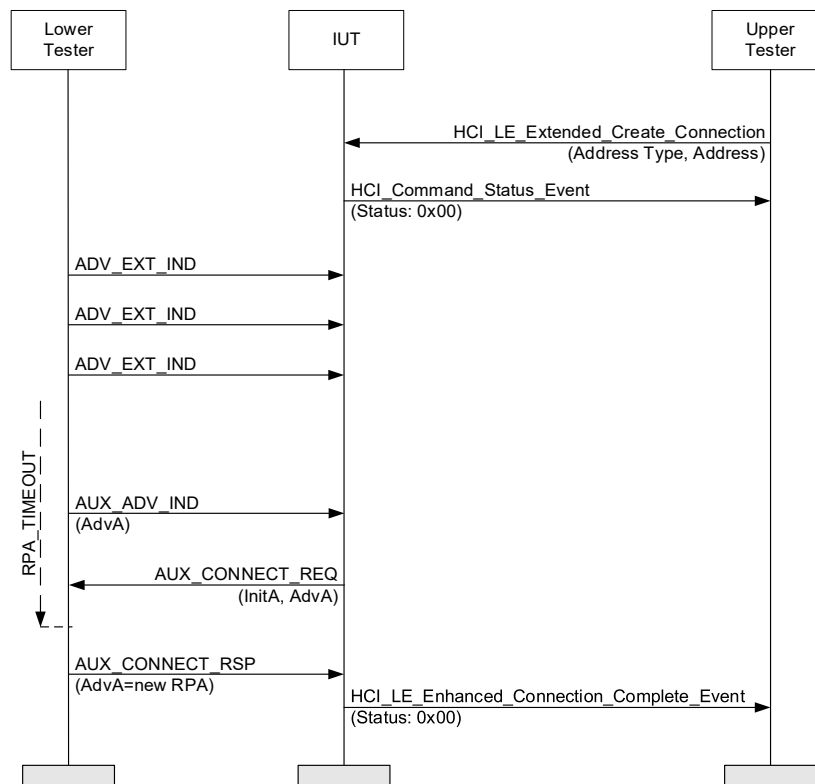


Figure 4.136: HCI/CM/BV-04-C [Extended Scanning with Device Privacy, RPA Timeout During Connection Initiation] MSC

1. The Upper Tester sends an HCI_LE_Extended_Create_Connection command to the IUT. The peer address and address type is set to the ones used by the Lower Tester. The Upper Tester receives an HCI_Command_Status event in response.
 2. The Lower Tester begins advertising using the ADV_EXT_IND PDU with the AuxPtr field referencing the AUX_ADV_IND.
 3. The Lower Tester receives an AUX_CONNECT_REQ PDU on the secondary advertising channel after sending any of the AUX_ADV_IND PDUs.
 4. An RPA Timeout is simulated on the Lower Tester.
 5. The Lower Tester sends an AUX_CONNECT_RSP PDU to the IUT on the secondary advertising channel with a new RPA.
 6. The Upper Tester receives an HCI_LE_Enhanced_Connection_Complete event from the IUT.
- Expected Outcome

Pass verdict

The test procedure completes with the IUT establishing a connection with the Lower Tester.

The HCI_LE_Enhanced_Connection_Complete event returns the latest Peer_Address, Peer_Resolvable_Private_Address and Local_Resolvable_Private_Address sent and received over the air.

HCI/CM/BV-05-C [LE Read Peer Resolvable Address Command – Peripheral]

- Test Purpose

Verify that the IUT correctly handles the LE Read Peer Resolvable Address Command.
- Reference

[2] 7.8.42
- Initial Condition
 - The IUT is Peripheral.
- Test Procedure

The Upper Tester populates the resolving list with the device identity of the Lower Tester, and its own device identity. The IUT uses this when generating a resolvable private address for the connection establishment.

The Upper Tester enables resolving list.

Configure the Lower Tester to initiate a connection while using resolvable private addresses.

The Upper Tester enables resolving list and directed connectable advertising in the IUT.

The IUT sends an LE Enhanced Connection Complete Event.

The Upper Tester issues a LE Read Peer Resolvable Address Command, with the identity address of the Lower Tester.

The Upper Tester receives a Command Complete event from the IUT for the LE Read Peer Resolvable Address Command with the Lower Tester's resolvable address.

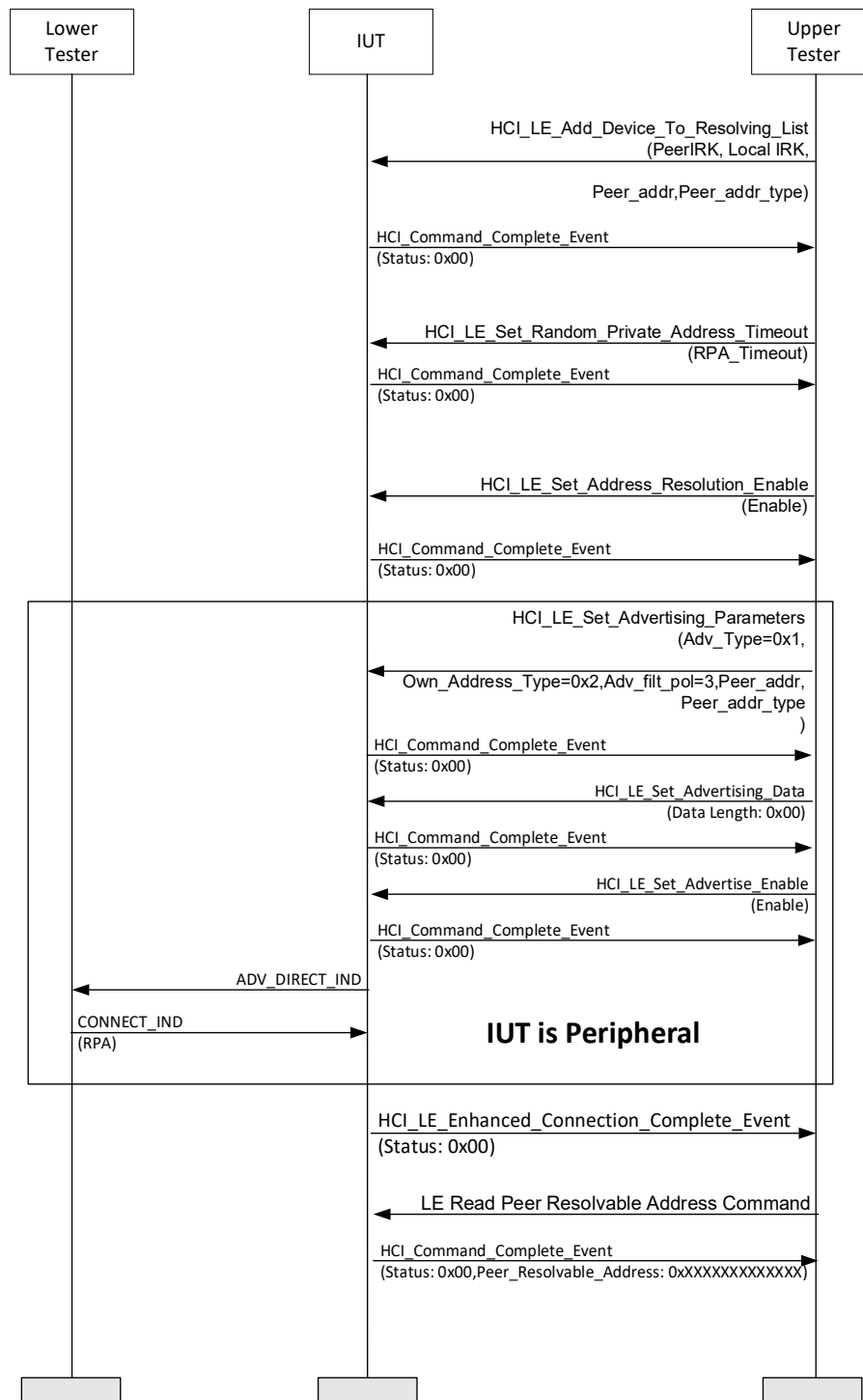


Figure 4.137: HCI/CM/BV-05-C [LE Read Peer Resolvable Address Command – Peripheral] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status=0x00 (Success) and Peer_resolvable_address=0XXXXXXXXXXXXX.

The received resolvable address is identical with the Peer_Resolvable_Private_Address received in the enhanced connection complete event.

HCI/CM/BV-06-C [LE Read Local Resolvable Address Command – Peripheral]

- Test Purpose

Verify that the IUT correctly handles the LE Read Local Resolvable Address Command.

- Reference

[2] 7.8.43

- Initial Condition

- The IUT is Peripheral.

- Test Procedure

The Upper Tester populates the resolving list with the device identity of the Lower Tester, and its own device identity. The IUT uses this when generating a resolvable private address for the connection establishment.

The Upper Tester enables resolving list.

Configure the Lower Tester to initiate a connection while using resolvable private addresses.

The Upper Tester enables resolving list and directed connectable advertising in the IUT.

The IUT sends an LE Enhanced Connection Complete Event.

The Upper Tester issues a LE Local Peer Resolvable Address Command, with the identity address of the Lower Tester.

The Upper Tester receives a Command Complete event from the IUT for the LE Local Peer Resolvable Address Command with the local resolvable address.

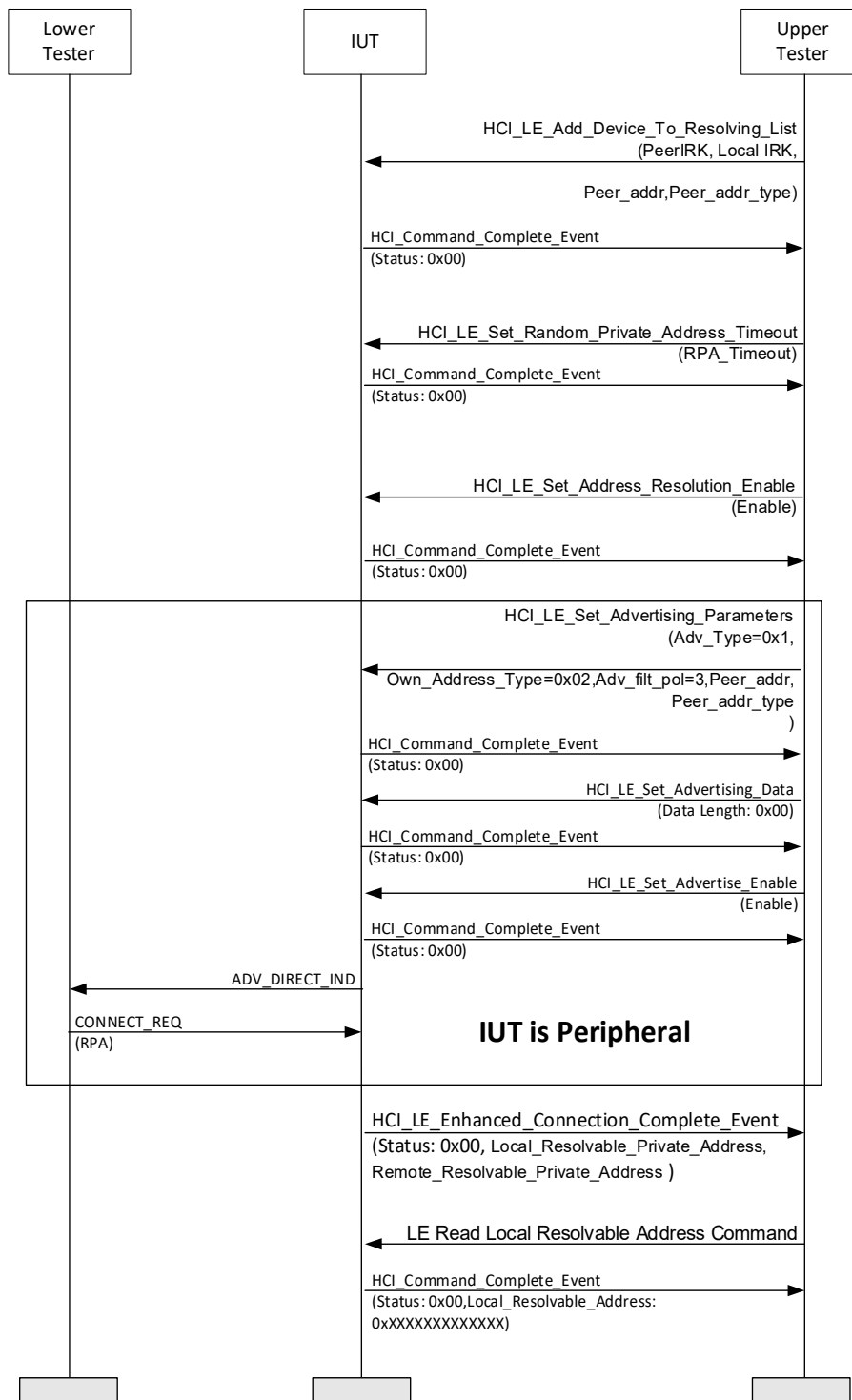


Figure 4.138: HCI/CM/BV-06-C [LE Read Local Resolvable Address Command – Peripheral] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status=0x00 (Success) and Local_Resolvable_Address=0XXXXXXXXXXXXX.

The received resolvable address is identical with the Local_Resolvable_Private_Address received in the enhanced connection complete event.

HCI/CM/BI-01-C [LE Extended Create Connection With Unsupported PHY]

- Test Purpose

Verify that the IUT properly rejects an HCI_LE_Extended_Create_Connection command that specifies unsupported PHYs.

- Reference

[9] 7.8.66

- Initial Condition

- The IUT is not currently connected.

- Test Procedure

For each bit on the Initiating_PHYs parameter of the HCI_LE_Extended_Create_Connection command that is an RFU bit or corresponds to a PHY not supported by the IUT:

The Upper Tester sends an HCI_LE_Extended_Create_Connection command to the IUT with Initiating_PHYs having only that bit set and receives an HCI_Command_Complete event with a non-zero status.

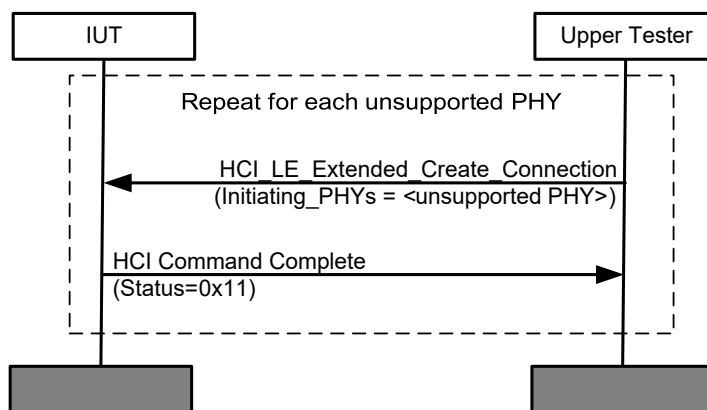


Figure 4.139: HCI/CM/BI-01-C [LE Extended Create Connection With Unsupported PHY] MSC

- Expected Outcome

If the IUT supports PHYs corresponding to all 8 bits of the Initiating_PHYs parameter, the test procedure will do nothing. This case is a Pass.

Pass verdict

Command Complete event for HCI_LE_Extended_Create_Connection is received by the Upper Tester with the error code Unsupported Feature or Parameter Value (0x11).

HCI/CM/BV-07-C [Request Sleep Clock Accuracy, unsupported SCA Update Feature]

- Test Purpose

Verify that when the IUT reads the peer's Sleep Clock Accuracy of a peer that doesn't support the Sleep Clock Accuracy Update feature, the Controller returns the error code *Unsupported Remote Feature/Unsupported LMP Feature* (0x1A).

- Reference

[12] 7.8.108

- Initial Condition

- The IUT is connected to the Lower Tester.
- The Lower Tester does not support the Sleep Clock Accuracy Update feature.
- A feature exchange has been executed between the IUT and the Lower Tester.

- Test Procedure

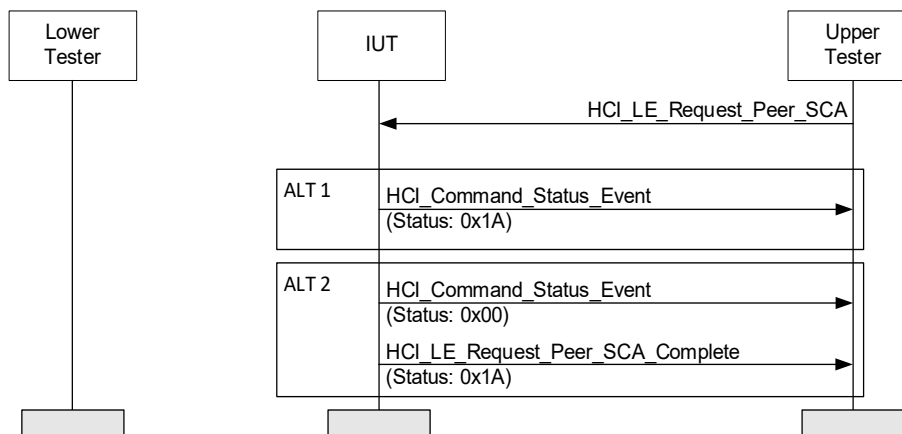


Figure 4.140: HCI/CM/BV-07-C [Request Sleep Clock Accuracy, unsupported SCA Update Feature] MSC

- The Upper Tester sends an HCI_LE_Request_Peer_SCA command to the IUT.
- The IUT returns an error code using one of the two following alternate test steps:
Alternate 1:
- The IUT sends the Upper Tester an HCI_Command_Status event with status *Unsupported Remote Feature/Unsupported LMP Feature* (0x1A).
Alternate 2:
- The IUT sends a successful HCI_Command_Status event to the Upper Tester.
- The IUT sends an HCI_LE_Request_Peer_SCA_Complete event with Status set to *Unsupported Remote Feature/Unsupported LMP Feature* (0x1A).

- Expected Outcome

Pass verdict

In Step 3, the IUT sends an HCI_Command_Status event to the Upper Tester with the status of 0x1A.

In Step 5, the IUT sends an HCI_LE_Request_Peer_SCA_Complete event to the Upper Tester with an *Unsupported Remote Feature/Unsupported LMP Feature* (0x1A) status.

4.13.1 LE Create Connection Cancel, Command Disallowed

- Test Purpose

Verify that when the IUT is initiator, it returns an error when the LE Create Connection Cancel command is called if no LE Create Connection or LE Extended Create Connection is pending.

- Reference

[11] 7.8.13

- Initial Condition

- The Lower Tester is configured as an advertiser using all supported advertising channels and using a public address.

- Test Case Configuration

Test Case	Connect Command
HCI/CM/BI-02-C	HCI_LE_Create_Connection
HCI/CM/BI-03-C	HCI_LE_Extended_Create_Connection

Table 4.87: LE Create Connection Cancel, Command Disallowed test cases

- Test Procedure

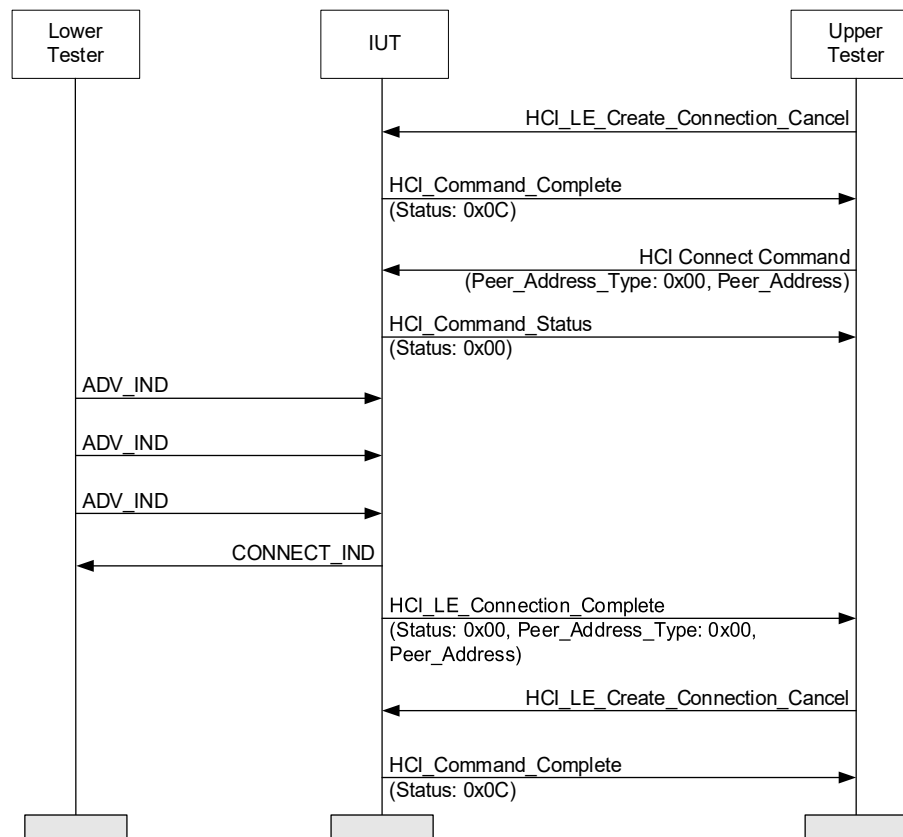


Figure 4.141: LE Create Connection Cancel, Command Disallowed MSC

1. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
3. The Upper Tester sends a Connect command as specified in Table 4.87 to the IUT with Peer_Address_Type set to 0x00 and Peer_Address set to the Lower Tester's public address, and it receives a successful HCI_Command_Status event in return.
4. The Lower Tester begins advertising ADV_IND packets.
5. The IUT sends a CONNECT_IND PDU to the Lower Tester after receiving an ADV_IND PDU.
6. The IUT sends an HCI_LE_Connection_Complete event to the Upper Tester with Peer_Address_Type set to 0x00 and the Peer_Address set to the Lower Tester's public address.
7. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT.
8. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Steps 3 and 8, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

4.13.2 Connection Attempt Rejected When Connected to the Peer

- Test Purpose

Verify that when the IUT is initiator and connected to the peer device, it returns an error when there is a connection request to the peer device.

- Initial Condition

- The Lower Tester is configured as an advertiser using all supported advertising channels and using a public address.

- Test Case Configuration

Test Case ID	Reference	HCI Command/Event
HCI/CM/BI-04-C	[11] 7.8.12	HCI_LE_Create_Connection HCI_LE_Connection_Complete
HCI/CM/BI-05-C	[11] 7.8.66	HCI_LE_Extended_Create_Connection HCI_LE_Enhanced_Connection_Complete

Table 4.88: Connection Attempt Rejected When Connected to the Peer test cases

- Test Procedure

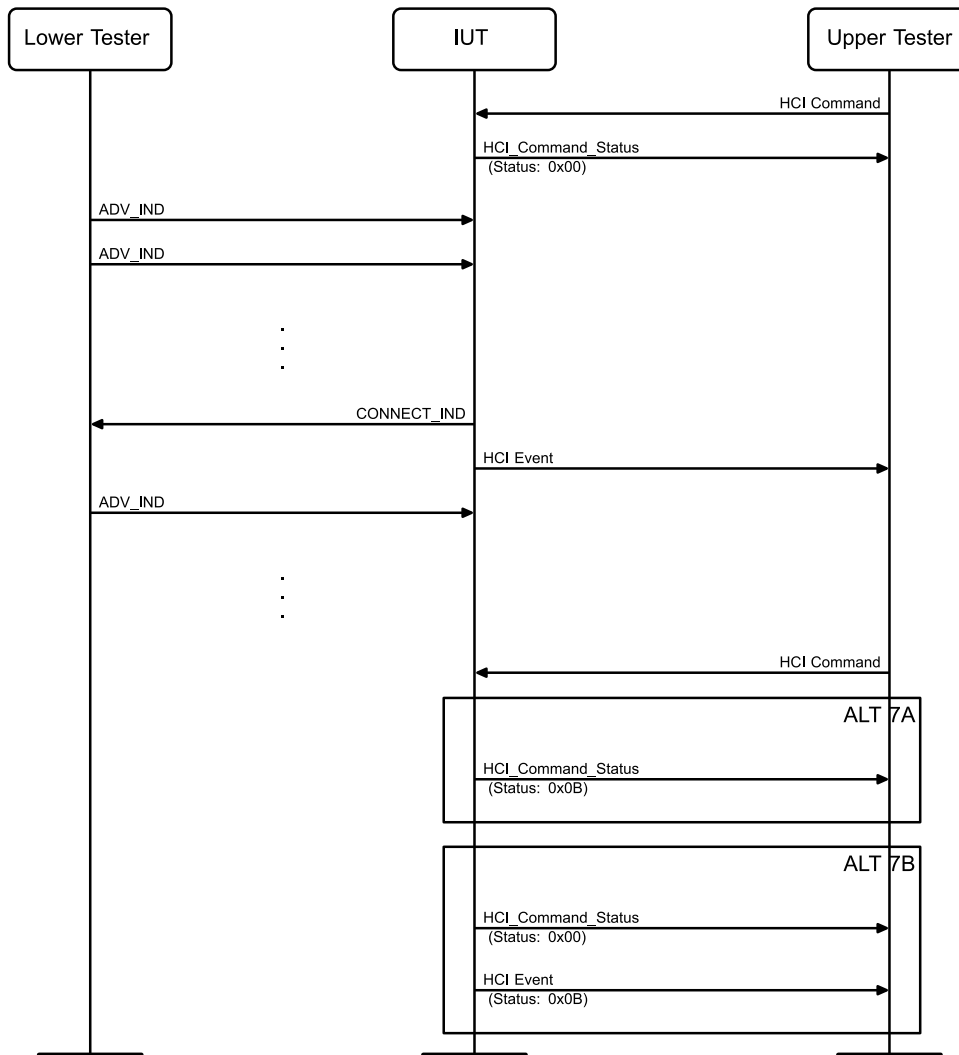


Figure 4.142: Connection Attempt Rejected When Connected to the Peer MSC

1. The Upper Tester sends an HCI command as specified in [Table 4.88](#) to the IUT with Peer_Address_Type set to 0x00 and Peer_Address set to the Lower Tester's public address, and it receives a successful HCI_Command_Status event in return.
2. The Lower Tester begins advertising ADV_IND packets.
3. The IUT sends a CONNECT_IND PDU to the Lower Tester after receiving an ADV_IND PDU.
4. The IUT sends an HCI event as specified in [Table 4.88](#) to the Upper Tester with Peer_Address_Type set to 0x00 and the Peer_Address set to the Lower Tester's public address.
5. The Lower Tester continues advertising ADV_IND packets.
6. The Upper Tester sends an HCI command as specified in [Table 4.88](#) to the IUT with Peer_Address_Type set to 0x00 and Peer_Address set to the Lower Tester's public address.
7. Perform alternative 7A or 7B depending on the IUT's response.
Alternative 7A (HCI_Command_Status event with an error code):
7A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Connection Already Exists (0x0B).

Alternative 7B (Successful HCI_Command_Status event):

- 7B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
- 7B.2 The IUT sends an HCI event as specified in [Table 4.88](#) to the Upper Tester with Status set to Connection Already Exists (0x0B).

- Expected Outcome

Pass verdict

In Step 7A.1 or 7B.2, the IUT sends a 0x0B error code.

4.14 LE Power Control

HCI/PCL/BV-01-C [LE Enhanced Read Transmit Power Level]

- Test Purpose

Verify that the LE Enhanced Read Transmit Power Level command returns the current and maximum transmit power level of the local Controller on an ACL connection.

- Reference

[\[12\]](#) 7.8.117

- Initial Condition

- ACL connection established, the IUT is Central or Peripheral.

- Test Procedure

1. The Upper Tester issues an LE Enhanced Read Transmit Power Level command to the IUT containing the current connection handle.
2. The Upper Tester receives a Command Complete event from the IUT for the LE Enhanced Read Transmit Power Level command containing the connection handle, the value for PHY matching the current PHY for the active connection, and the values for Current_TX_Power_Level and Max_TX_Power_Level as the current and maximum transmit power level of the local Controller for the active connection.

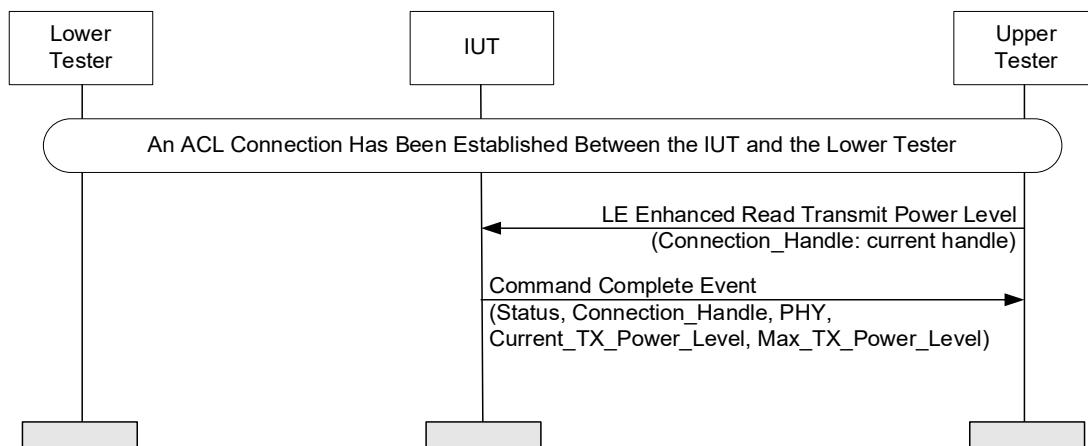


Figure 4.143: HCI/PCL/BV-01-C [LE Enhanced Read Transmit Power Level] MSC

- Expected Outcome

Pass verdict

The Upper Tester receives a Command Complete event from the IUT with Status = 0x00 (Success) and with the value for Connection_Handle matching the value sent in the LE Enhanced Read Transmit Power Level command.

The PHY field contains a value which matches the PHY selected for the current active connection, Current_TX_Power_Level and Max_TX_Power_Level in the range described in the specifications, with Current_TX_Power_Level less than or equal to Max_TX_Power_Level.

4.14.1 LE Enhanced Read Transmit Power Level with Unsupported or Invalid Parameters

- Test Purpose

Verify that the IUT properly handles the LE Enhanced Read Transmit Power Level command with unsupported or invalid parameters.

- Reference

[13] 7.8.117

- Initial Condition

- ACL connection established, the IUT is Central or Peripheral.

- Test Case Configuration

Test Case	Parameter	Value	Status
HCI/PCL/BI-01-C	PHY	0x02 (LE 2M)	0x11
HCI/PCL/BI-02-C	PHY	0x03 (LE Coded S=8)	0x11
HCI/PCL/BI-03-C	PHY	0x04 (LE Coded S=2)	0x11
HCI/PCL/BI-04-C	Connection_Handle	Not the current ACL	0x02

Table 4.89: LE Enhanced Read Transmit Power Level with Unsupported or Invalid Parameters test cases

- Test Procedure

- The Upper Tester sends the HCI_LE_Enhanced_Read_Transmit_Power_Level command to the IUT with the parameter and value specified in [Table 4.89](#).
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set as specified in [Table 4.89](#).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event with Status set as specified in [Table 4.89](#).

4.14.2 LE Read Remote Transmit Power Level with Unsupported or Invalid Parameters

- Test Purpose

Verify that the IUT properly handles the LE Read Remote Transmit Power Level command with unsupported or invalid parameters.

- Reference

[13] 7.8.118

- Initial Condition

- ACL connection established, the IUT is Central or Peripheral.

- Test Case Configuration

Test Case	Parameter	Value	Status
HCI/PCL/BI-05-C	PHY	0x02 (LE 2M)	0x11
HCI/PCL/BI-06-C	PHY	0x03 (LE Coded S=8)	0x11
HCI/PCL/BI-07-C	PHY	0x04 (LE Coded S=2)	0x11
HCI/PCL/BI-08-C	Connection_Handle	Not the current ACL	0x02

Table 4.90: LE Read Remote Transmit Power Level with Unsupported or Invalid Parameters test cases

- Test Procedure

- The Upper Tester sends the HCI_LE_Read_Remote_Transmit_Power_Level command to the IUT with the parameter and value specified in [Table 4.90](#).
- Perform either alternative 2A or 2B depending on whether the IUT sends the error status in the HCI_Command_Status event.
 - Alternative 2A (The IUT sends the error in the HCI_Command_Status event)
 - 2A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set as specified in [Table 4.90](#).
 - Alternative 2B (The IUT sends the error in the HCI_LE_Transmit_Power_Reporting event)
 - 2B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2B.2 The IUT sends an HCI_LE_Transmit_Power_Reporting event to the Upper Tester with Status set as specified in [Table 4.90](#).

- Expected Outcome

Pass verdict

In Step 2A.1 or 2B.2, an error status is returned to the Upper Tester.

4.15 Isochronous Streams

4.15.1 Connected Isochronous Streams

Verify the correct implementation of the Connected Isochronous Stream commands and events.

4.15.1.1 Connected Isochronous Stream Using Non-Test Command, Central Initiated

- Test Purpose

Verify that a Central IUT can set up a Connected Isochronous Stream using the LE Setup CIG Parameters Command (the non-test variant) and correctly handles error conditions.
- Reference

[12] 7.1.6, 7.8.97
- Initial Condition
 - An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle. The connection supervision timeout may be set to a long interval to facilitate testing.
 - The event mask has been configured to allow the HCI_LE_CIS_Established [v1] and [v2] events to be passed to the Upper Tester.
 - The Lower Tester acts in the Peripheral role.
 - TSPX_max_cis_per_cigs is the Max Supported CIGs as specified in IXIT.
- Test Case Configuration

Test Case	Steps 9 and 10 performed	Step 13 performed	Step 14 performed	Step 21B allowed
HCI/CIS/BV-01-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Core v5.2 to v5.4]	No	Yes	No	Yes
HCI/CIS/BV-02-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Core v5.2 to v5.4]	No	Yes	Yes	Yes
HCI/CIS/BV-03-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Core v5.2 to v5.4]	Yes	Yes	No	Yes
HCI/CIS/BV-04-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Core v5.2 to v5.4]	Yes	Yes	Yes	Yes

Test Case	Steps 9 and 10 performed	Step 13 performed	Step 14 performed	Step 21B allowed
HCI/CIS/BV-15-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Unsegmented Framed mode]	No	No	No	No
HCI/CIS/BV-16-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Unsegmented Framed mode]	No	No	Yes	No
HCI/CIS/BV-17-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Unsegmented Framed mode]	Yes	No	No	No
HCI/CIS/BV-18-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Unsegmented Framed mode]	Yes	No	Yes	No
HCI/CIS/BV-19-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Core v6.0 or later, Unsegmented Framed mode not supported]	No	Yes	No	No
HCI/CIS/BV-20-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Core v6.0 or later, Unsegmented Framed mode not supported]	No	Yes	Yes	No
HCI/CIS/BV-21-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Core v6.0 or later, Unsegmented Framed mode not supported]	Yes	Yes	No	No

Test Case	Steps 9 and 10 performed	Step 13 performed	Step 14 performed	Step 21B allowed
HCI/CIS/BV-22-C [Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Core v6.0 or later, Unsegmented Framed mode not supported]	Yes	Yes	Yes	No

Table 4.91: Connected Isochronous Stream Using Non-Test Command, Central Initiated test cases

- Test Procedure

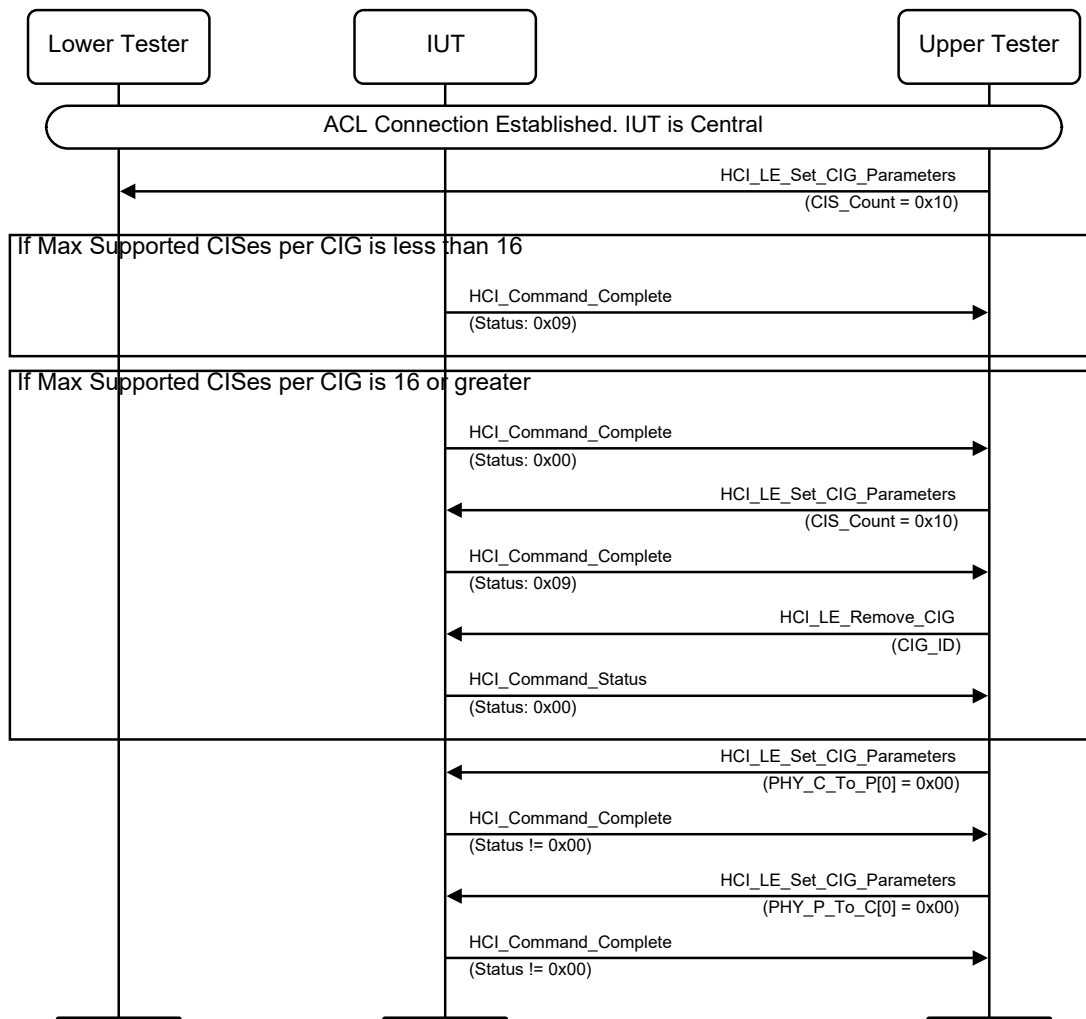


Figure 4.144: Connected Isochronous Stream Using Non-Test Command, Central Initiated MSC – Page 1 of 4

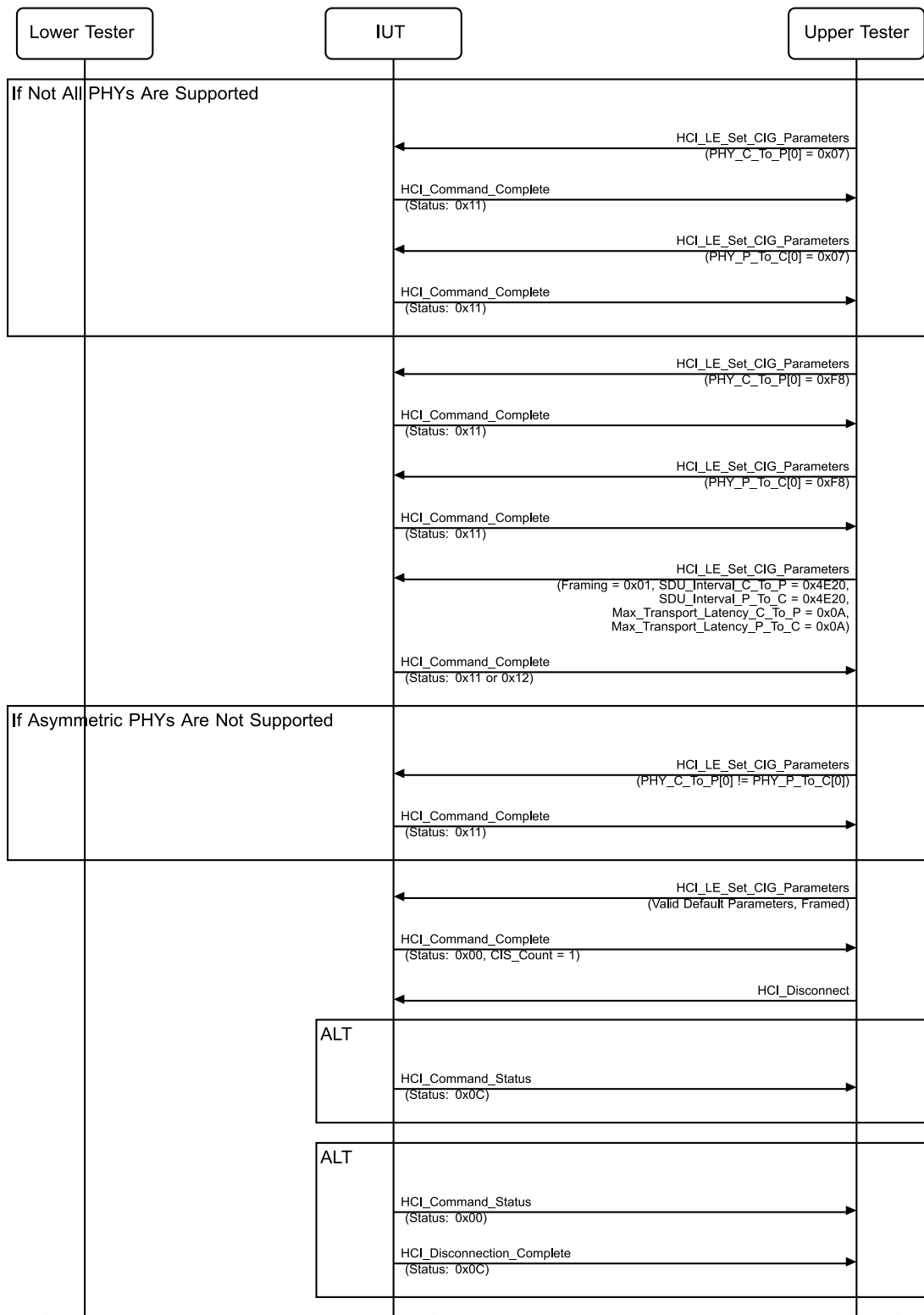


Figure 4.145: Connected Isochronous Stream Using Non-Test Command, Central Initiated MSC – Page 2 of 4

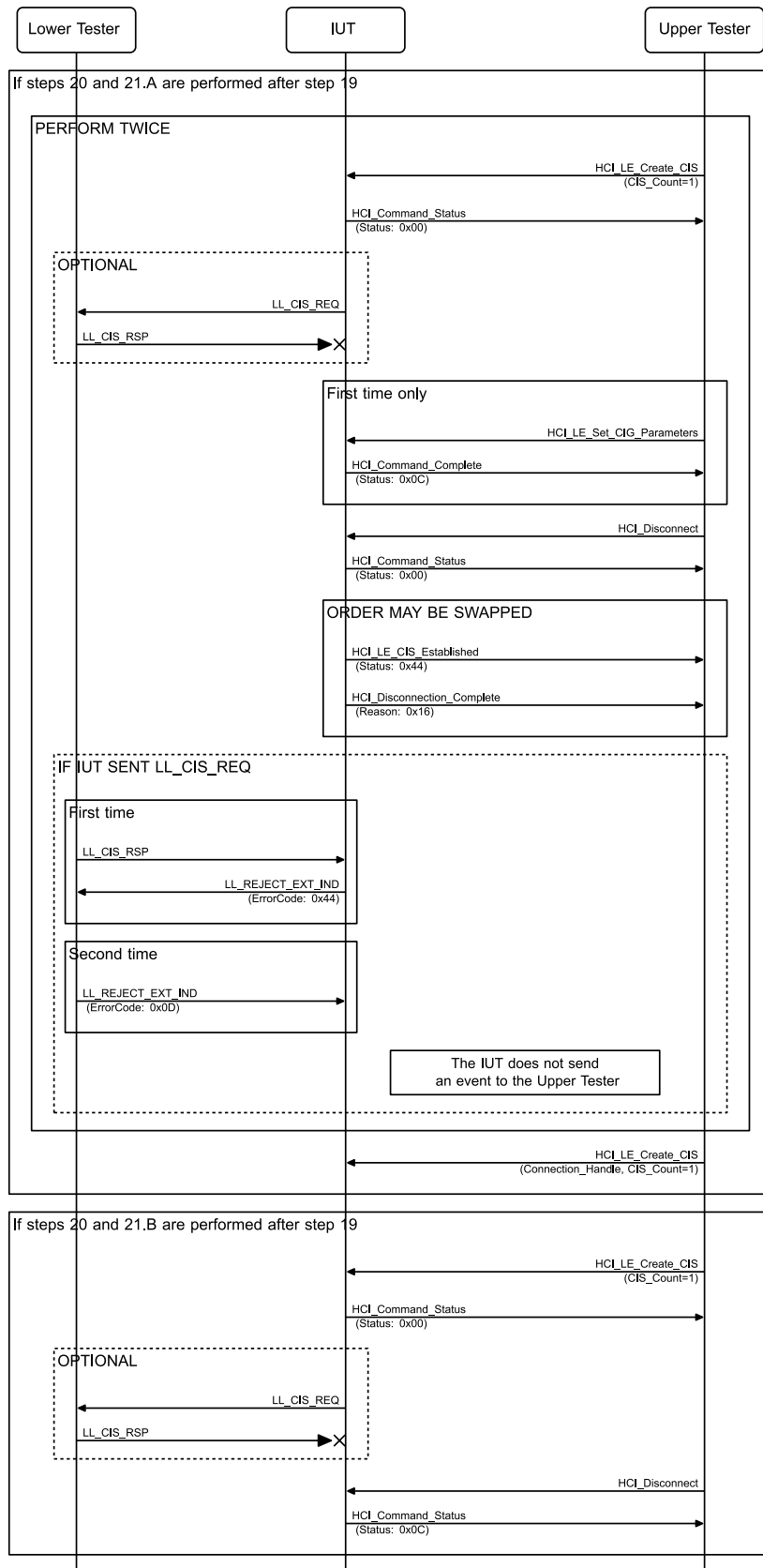


Figure 4.146: Connected Isochronous Stream Using Non-Test Command, Central Initiated MSC – Page 3 of 4

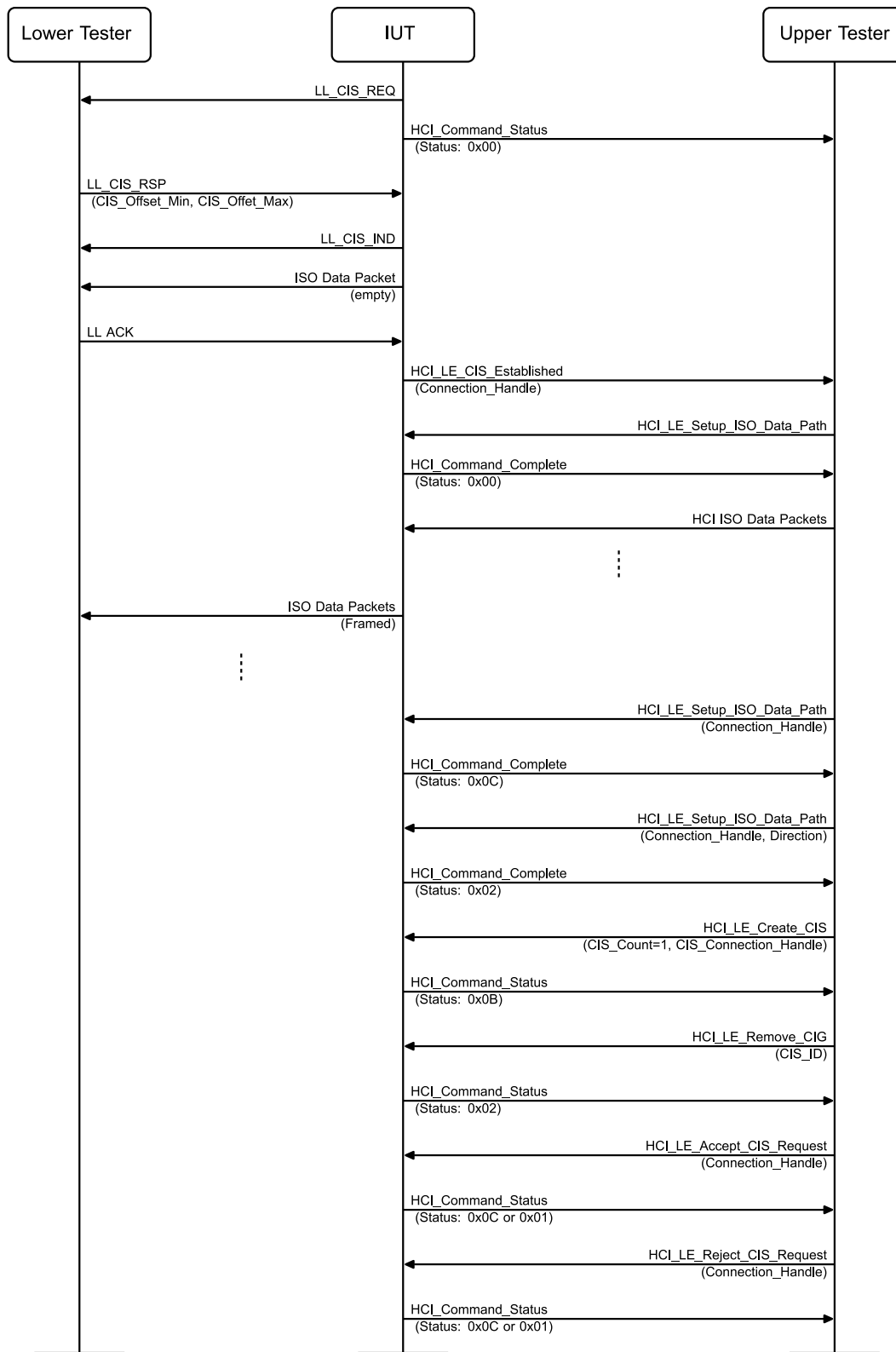


Figure 4.147: Connected Isochronous Stream Using Non-Test Command, Central Initiated MSC – Page 4 of 4

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT using common values and CIS_Count set to 0x10. Here, and elsewhere, to facilitate testing, long intervals may be used.
2. If TSPX_max_cis_per_cigs is less than 16, then the IUT returns error code Connection Limit Exceeded (0x09) to the Upper Tester. Proceed to Step 7.
3. The IUT returns a success response to the Upper Tester.
4. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT using default values and CIS_Count set to 0x10.
5. The IUT returns error code Connection Limit Exceeded (0x09) to the Upper Tester.
6. The Upper Tester sends an HCI_LE_Remove_CIG command with the CIG_ID of the CIG that was initially created and receives a success response.
7. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_C_To_P[0] set to 0x00 and the other values set to common values, and receives an error response.
8. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_P_To_C[0] set to 0x00 and the other values set to common values, and receives an error response.
9. If this step is performed (see [Table 4.91](#)), the Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_C_To_P[0] set to 0x07 to the IUT and receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.
10. If this step is performed (see [Table 4.91](#)), the Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_P_To_C[0] set to 0x07 to the IUT and receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.
11. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_C_To_P[0] set to 0x0F8 to the IUT and receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.
12. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_P_To_C[0] set to 0x0F8 to the IUT and receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.
13. If this step is performed (see [Table 4.91](#)), the Upper Tester sends an HCI_LE_Set_CIG_Parameters command with Framing set to 0x01, SDU_Interval_C_To_P set to 0x4E20 (20 ms), SDU_Interval_P_To_C set to 0x4E20 (20 ms), Max_Transport_Latency_C_To_P set to 0x0A (10 ms), and Max_Transport_Latency_P_To_C set to 0x0A (10 ms) to the IUT and receives error code Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12) from the IUT.
14. If this step is performed (see [Table 4.91](#)), the Upper Tester sends an HCI_LE_Set_CIG_Parameters command with PHY_P_To_C[0] set to a valid but different value than PHY_C_To_P[0] and receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.
15. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with default parameters but with framing enabled, and receives a success response from the IUT and CIS_Count = 1.
16. The Upper Tester sends an HCI_Disconnect command for the CIS to the IUT. The IUT responds with a successful HCI_Command_Status, followed by an HCI_Disconnection_Complete event with an error code Command Disallowed (0x0C). Alternately, the IUT replies with error code Command Disallowed (0x0C) in the HCI_Command_Status.
17. The Upper Tester sends an HCI_LE_Create_CIS command to create a single CIS and receives a success response from the IUT.
18. The IUT may send an LL_CIS_REQ PDU, but the Lower Tester does not respond.

Steps 19 and 20 must execute before an HCI_LE_CIS_Established event is received. If they cannot be executed quickly enough, they may need to be repeated individually under the same conditions.

19. Immediately, before an HCI_LE_CIS_Established event is received, the Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT, and the IUT responds with an error code Command Disallowed (0x0C).
20. Immediately, before an HCI_LE_CIS_Established event is received, the Upper Tester sends an HCI_Disconnect command for the CIS being established to the IUT.
21. Perform either Step 21A or Step 21B depending on the IUT response. Step 21B is only allowed if specified in [Table 4.91](#).

Alternative 21A (The IUT sends a successful HCI_Command_Status):

- 21A.1 The order of a), b), and c) may be swapped, as long as c) is after a).
 - 21A.1.a) The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 21A.1.b) The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with an error code Operation Cancelled by Host (0x44).
 - 21A.1.c) The IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Reason set to Connection Terminated by Local Host (0x16).
- 21A.2 If the IUT sent an LL_CIS_REQ PDU in Step 18, then execute Steps 21A.2.a, 21A.2.b, and 21A.2.c.
 - 21A.2.a) The Lower Tester sends an LL_CIS_RSP to the IUT as soon as either a) or b) of Step 20 has happened.
 - 21A.2.b) The IUT sends an LL_REJECT_EXT_IND PDU to the Lower Tester with ErrorCode set to Operation Cancelled by Host (0x44). This may happen before the remaining items in Step 20.
 - 21A.2.c) The IUT does not send an event to the Upper Tester other than those in Step 21A.1.
- 21A.3 Repeat Steps 17, 18, 20, and 21A.1.
- 21A.4 The Lower Tester sends an LL_REJECT_EXT_IND PDU to the IUT with ErrorCode set to Rejected Due To Limited Resources (0x0D).
- 21A.5 The IUT does not send an event to the Upper Tester other than those in Step 21A.1.
- 21A.6 The Upper Tester sends an HCI_LE_Create_CIS command to create a single CIS and receives a success response from the IUT.

Alternative 21B (The IUT sends an HCI_Command_Status with an 0x0C error code):

- 21B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with an error code Command Disallowed (0x0C).
22. The Lower Tester receives an LL_CIS_REQ PDU from the IUT.
23. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
24. The Lower Tester receives an LL_CIS_IND from the IUT.
25. The Upper Tester receives an HCI_LE_CIS_Established event indicating success, after the first CIS packet sent by the Lower Tester. The Connection_Handle parameter is set to the value provided in the HCI_LE_Create_CIS command.
26. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command and receives a success response from the IUT.
27. The Upper Tester sends HCI ISO data packets over the CIS and the Lower Tester receives framed ISO data.
28. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Connection_Handle and Direction equal to that in Step 22 and the IUT sends error code Command Disallowed (0x0C) in return.

29. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with a previously unused Connection_Handle value, and the IUT sends error code Unknown Connection Identifier (0x02) in return.
30. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with CIS_Count set to 0x01 and CIS_Connection_Handle set to that in Step 25, and the IUT sends error code Connection Already Exists (0x0B) in return.
31. The Upper Tester sends an HCI_LE_Remove_CIG command to the IUT with CIG_ID set to a previously unused value, and the IUT sends error code Unknown Connection Identifier (0x02) in return.
32. The Upper Tester sends an HCI_LE_Accept_CIS_Request command to the IUT, and the IUT sends error code Command Disallowed (0x0C) in return if the IUT supports LL 9/32, and Unknown HCI command (0x01) otherwise.
33. The Upper Tester sends an HCI_LE_Reject_CIS_Request command to the IUT, and the IUT sends error code Command Disallowed (0x0C) in return if the IUT supports LL 9/32, and Unknown HCI command (0x01) otherwise.

- Expected Outcome

Pass verdict

If TSPX_max_cis_per_cigs is less than 16, then in Step 2, the IUT returns error code Connection Limit Exceeded (0x09) to the Upper Tester.

If TSPX_max_cis_per_cigs is 16 or greater, then the following pass criteria apply:

In Step 3, the IUT returns a success response to the Upper Tester.

In Step 5, the IUT returns error code Connection Limit Exceeded (0x09) to the Upper Tester.

In Step 6, the Upper Tester sends an HCI_LE_Remove_CIG command with the CIG_ID of the CIG that was initially created and receives a success response.

In Step 7, the Upper Tester receives an error response.

In Step 8, the Upper Tester receives an error response.

In Step 9, if performed, the Upper Tester receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.

In Step 10, if performed, the Upper Tester receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.

In Step 11, the IUT responds with error code Unsupported Feature or Parameter Value (0x11).

In Step 12, the IUT responds with error code Unsupported Feature or Parameter Value (0x11).

In Step 13, if performed, the Upper Tester receives error code Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12) from the IUT.

In Step 14, if performed, the Upper Tester receives error code Unsupported Feature or Parameter Value (0x11) from the IUT.

In Step 15, the Upper Tester receives a success response from the IUT and CIS_Count = 1.

In Step 16, the IUT responds with a successful HCI_Command_Status, followed by an HCI_Disconnection_Complete event with an error code Command Disallowed (0x0C). Alternately, the IUT replies with error code Command Disallowed (0x0C) in the HCI_Command_Status.

In Step 17, the Upper Tester receives a success response from the IUT.

In Step 19, the IUT responds with an error code Command Disallowed (0x0C).

In Step 21A.1, the IUT responds as indicated.

In Step 21A.2.b, the IUT sends an LL_REJECT_EXT_IND PDU to the Lower Tester with ErrorCode set to Operation Cancelled by Host (0x44).

In Step 21B.1, the IUT sends a Command Disallowed (0x0C) error code in response.

In Step 22, the Lower Tester receives an LL_CIS_REQ PDU from the IUT.

In Step 24, the Lower Tester receives an LL_CIS_IND from the IUT as described.

In Step 25, the Upper Tester receives an HCI_LE_CIS_Established event indicating success. The Connection_Handle parameter is set to the value provided in the HCI_LE_Create_CIS command. If the IUT sends an HCI_LE_CIS_Established [v2] event, then the Sub_Interval, Max_SDU_C_To_P, Max_SDU_P_To_C, SDU_Interval_C_To_P, SDU_Interval_P_To_C, and Framing parameters are set to the corresponding values from the LL_CIS_REQ PDU sent in Step 22.

In Step 26, the Upper Tester receives a success response from the IUT.

In Step 27, the Lower Tester receives framed ISO data.

In Step 28, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

In Step 29, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Handle (0x02).

In Step 30, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Connection Already Exists (0x0B).

In Step 31, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

In Step 32, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Command Disallowed (0x0C) if the IUT supports LL 9/32, and Unknown HCI command (0x01) otherwise.

In Step 33, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Command Disallowed (0x0C) if the IUT supports LL 9/32, and Unknown HCI command (0x01) otherwise.

Fail verdict

In Step 21A.3, the IUT sends an event other than the ones in Step 20.

HCI/CIS/BI-11-C [Connected Isochronous Stream, Central Initiated, CIG Parameters Failure Behavior]

- Test Purpose

Verify that a Central IUT ignores any settings provided in a Set CIG Parameters command that failed.

- Reference

[13] 7.8.97

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
- The Lower Tester acts in the Peripheral role.

- Test Procedure

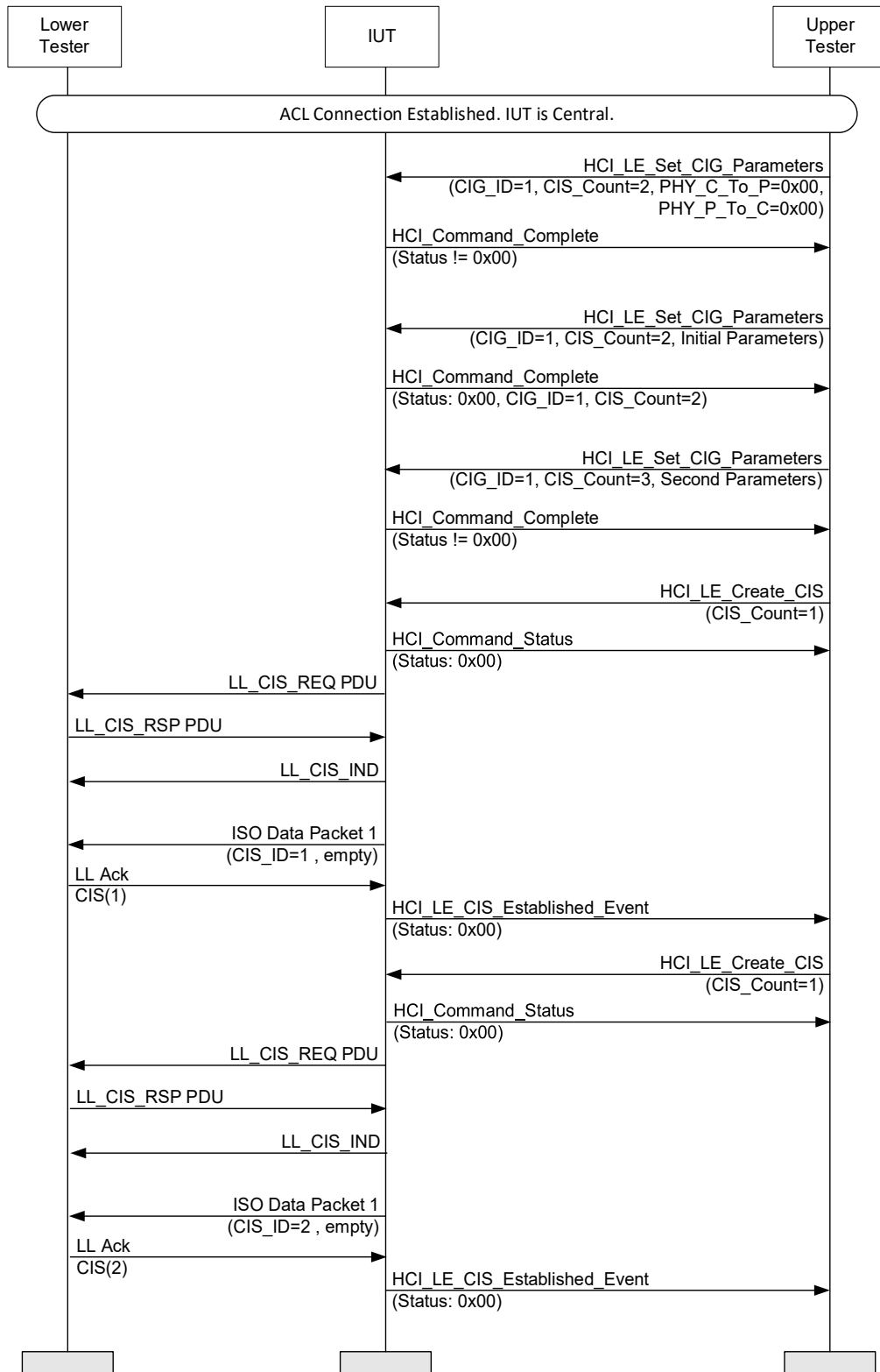


Figure 4.148: HCI/CIS/BI-11-C [Connected Isochronous Stream, Central Initiated, CIG Parameters Failure Behavior] MSC

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with PHY_C_To_P for both CIS = 0x00, all the remaining values as specified in [Table 4.92](#).
2. The IUT sends an HCI_Command_Complete event to the Upper Tester failing the command.
3. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with the values specified in the Initial Value(s) column specified in [Table 4.92](#).
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status = 0x00, CIG_ID = 0x01, and CIS_Count = 2.
5. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with the values specified in the Second Value(s) column specified in [Table 4.92](#).
6. The IUT sends an HCI_Command_Complete event to the Upper Tester failing the command.
7. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT for CIS_ID 0x01.
8. The IUT sends an HCI_Command_Status event to the Upper Tester with Status = 0x00.
9. The IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x01.
10. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
11. The IUT sends an LL_CIS_IND PDU to the Lower Tester.
12. The IUT sends an empty ISO Data packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.
13. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester for CIS_ID 0x01.
14. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT for CIS_ID 0x02.
15. The IUT sends an HCI_Command_Status event to the Upper Tester with Status = 0x00.
16. The IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID = 0x02.
17. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
18. The IUT sends an LL_CIS_IND PDU to the Lower Tester.
19. The IUT sends an empty ISO Data Packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.
20. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester for CIS_ID 0x02.

Parameter	Initial Value(s)	Second Value(s)
CIG_ID	0x01	0x01
SDU_Interval_C_To_P, SDU_Interval_P_To_C	50 ms	60 ms
CIS_Count	2	3
CIS_ID[]	0x01, 0x02	0x01, 0x02, 0x03
Worst_Case_SCA	0x00	0x01
Packing	Sequential (0x00)	Interleaved (0x01)
Framing	Framed (0x01)	Unframed (0x00)
Max_SDU_C_To_P[]	16, 16	4096, 4096, 4096
Max_SDU_P_To_C[]	16, 16	4096, 4096, 4096
Max_Transport_Latency_C_To_P, Max_Transport_Latency_P_To_C	200 ms	250 ms
RTN_C_To_P[]	4, 4	5, 5, 5
RTN_P_To_C[]	4, 4	5, 5, 5
PHY_C_To_P[]	0x01, 0x01	0x01, 0x01, 0x01
PHY_P_To_C[]	0x01, 0x01	0x00, 0x01, 0x01

Table 4.92: CIG Parameter Values

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester failing the command.

In Step 4, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status = 0x00, CIG_ID = 0x01, and CIS_Count = 2.

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester failing the command.

In Step 8, the IUT sends an HCI_Command_Status event to the Upper Tester with Status = 0x00.

In Step 9, the IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x01. Framed PDUs are specified.

In Step 11, the IUT sends an LL_CIS_IND PDU to the Lower Tester.

In Step 13, the IUT sends an HCI_LE_CIS_Established event to the Upper Tester for CIS_ID 0x01.

In Step 15, the IUT sends an HCI_Command_Status event to the Upper Tester with Status = 0x00.

In Step 16, the IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID = 0x02. Framed PDUs are specified.

In Step 18, the IUT sends an LL_CIS_IND PDU to the Lower Tester.

In Step 20, the IUT sends an HCI_LE_CIS_Established event to the Upper Tester for CIS_ID 0x02.

The resulting CIG with 2 CISes meets the following criteria:

- SDU_Interval_C_To_P and SDU_Interval_P_To_C are the value specified in the Initial Value(s) column in [Table 4.92](#).
- The CIS IDs match the values specified in the Initial Value(s) column in [Table 4.92](#).
- Max_SDU_C_To_P[] are the values specified in the Initial Value(s) column in [Table 4.92](#).
- Max_SDU_P_To_C[] are the values specified in the Initial Value(s) column in [Table 4.92](#).

4.15.1.2 Ignoring RFU Bits in HCI ISO Data Packets, CIS

- Test Purpose

Verify that the IUT ignores RFU bits in ISO Data Packets received from the Upper Tester and sends the ISO data in a CIS.

- Reference

[\[12\] 5.4.5](#)

- Initial Condition

- CIS established in the relevant role defined in [Table 4.95](#) per the following configurations:

Variable	Value(s)
sdu_int_c2p	0x186A0 (100 ms)
sdu_int_p2c	0x186A0 (100 ms)
ft_c2p	1
ft_p2c	1

Variable	Value(s)
iso_int	0x50 (100 ms)
packing	any supported
framing	any
cis_cnt	1
nse[]	0x03
mx_sdu_c2p[]	8
mx_sdu_p2c[]	0
mx_pdu_c2p[]	8
mx_pdu_p2c[]	0
phy_c2p[]	0x01
phy_p2c[]	0x01
bn_c2p[]	0x01
bn_p2c[]	0x00

Table 4.93: IUT as Central configuration

Variable	Value(s)
sdu_int_c2p	0x186A0 (100 ms)
sdu_int_p2c	0x186A0 (100 ms)
ft_c2p	1
ft_p2c	1
iso_int	0x50 (100 ms)
packing	any supported
framing	any
cis_cnt	1
nse[]	0x03
mx_sdu_c2p[]	0
mx_sdu_p2c[]	8
mx_pdu_c2p[]	0
mx_pdu_p2c[]	8
phy_c2p[]	0x01
phy_p2c[]	0x01
bn_c2p[]	0x00
bn_p2c[]	0x01

Table 4.94: IUT as Peripheral configuration

- Test Case Configuration

Test Case	IUT Role
HCI/CIS/BI-01-C [Receiving HCI ISO Data Packets with RFU Bits Set, CIS, Central]	Central
HCI/CIS/BI-02-C [Receiving HCI ISO Data Packets with RFU Bits Set, CIS, Peripheral]	Peripheral

Table 4.95: Ignoring RFU Bits in HCI ISO Data Packets, CIS test cases

- Test Procedure

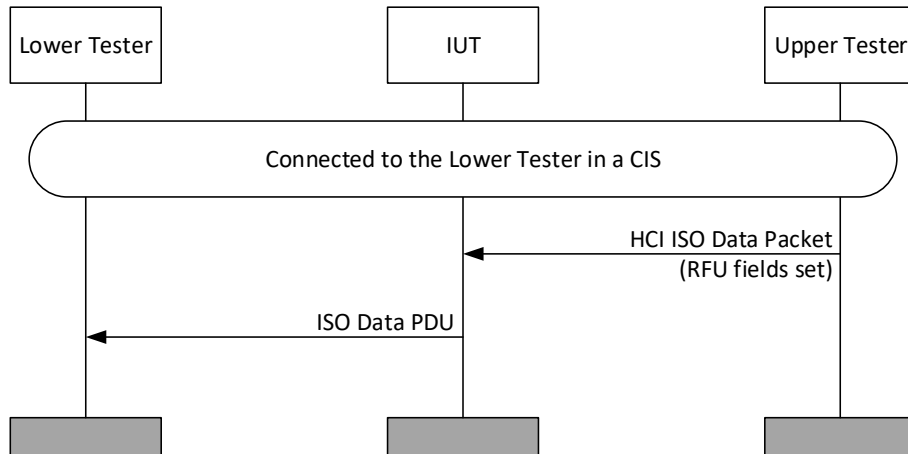


Figure 4.149: Ignoring RFU Bits in HCI ISO Data Packets, CIS MSC

1. The Upper Tester sends HCI ISO Data packets to the IUT with all RFU field bits set.
2. The IUT sends the ISO Data packets to the Lower Tester.

- Expected Outcome

Pass verdict

The IUT sends the ISO Data packets to the Lower Tester.

4.15.1.3 Connected Isochronous Stream, Reject Early Read ISO TX Sync

- Test Purpose

Verify that an IUT properly rejects the LE Read ISO TX Sync command issued by the Upper Tester before an SDU has been transmitted by the IUT.

- Reference

[\[12\]](#) 7.8.96

- Initial Condition

- The IUT is in the specified role.
- A CIS has been established using Framing=unframed and all other values as specified in [\[14\]](#) Section 4.10.1.3, Default Values for Set_CIG_Parameters_Test Commands, the ISO data path has been set up, and the Upper Tester does not provide SDU data.
- The Lower Tester is in the peer role to the IUT.
- The Lower Tester sends CIS NULL PDUs in each sub-event.

- Test Case Configuration

Test Case
HCI/CIS/BI-03-C [Connected Isochronous Stream, Central, Reject Early Read ISO TX Sync]
HCI/CIS/BI-04-C [Connected Isochronous Stream, Peripheral, Reject Early Read ISO TX Sync]

Table 4.96: Connected Isochronous Stream, Reject Early Read ISO TX Sync test cases

- Test Procedure

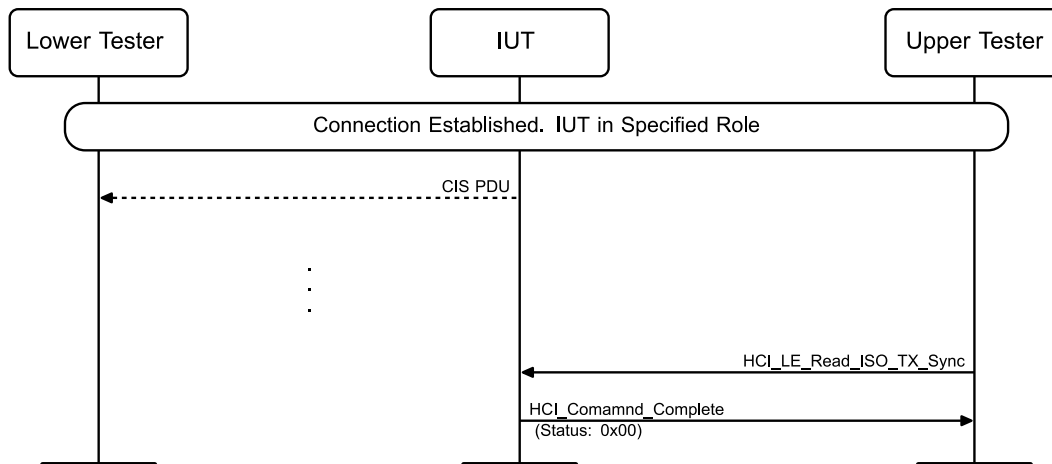


Figure 4.150: Connected Isochronous Stream, Reject Early Read ISO TX Sync MSC

1. The IUT starts sending CIS PDUs to the Lower Tester.
2. As soon as the Lower Tester has received a PDU or after 5 seconds if the IUT does not transmit any PDUs, the Upper Tester sends an HCI_LE_Read_ISO_TX_Sync command to the IUT.
3. The IUT sends an HCI_Command_Complete event to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 3:

- If the IUT only sends CIS Null PDUs to the Lower Tester or does not transmit in the subevent, then Status is set to Command Disallowed (0x0C).
- Otherwise, Status is set to 0 and the event has the TX_Time_Stamp and Packet_Sequence_Number fields set to appropriate values.

[HCI/CIS/BV-05-C \[Connected Isochronous Stream, Central Initiated, Add or Modify CIS\]](#)

- Test Purpose

Verify that a Central IUT can add or modify a Connected Isochronous Group before a CIS is created. Verify that a Central IUT rejects an LE Create CIS command when a CIS Connection Handle is specified twice.

- Reference

[\[15\]](#) 4.10.1.3

[\[12\]](#) 7.8.97

[\[13\]](#) 7.8.99



- Initial Condition
 - An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
 - The Lower Tester acts in the Peripheral role.
- Test Procedure

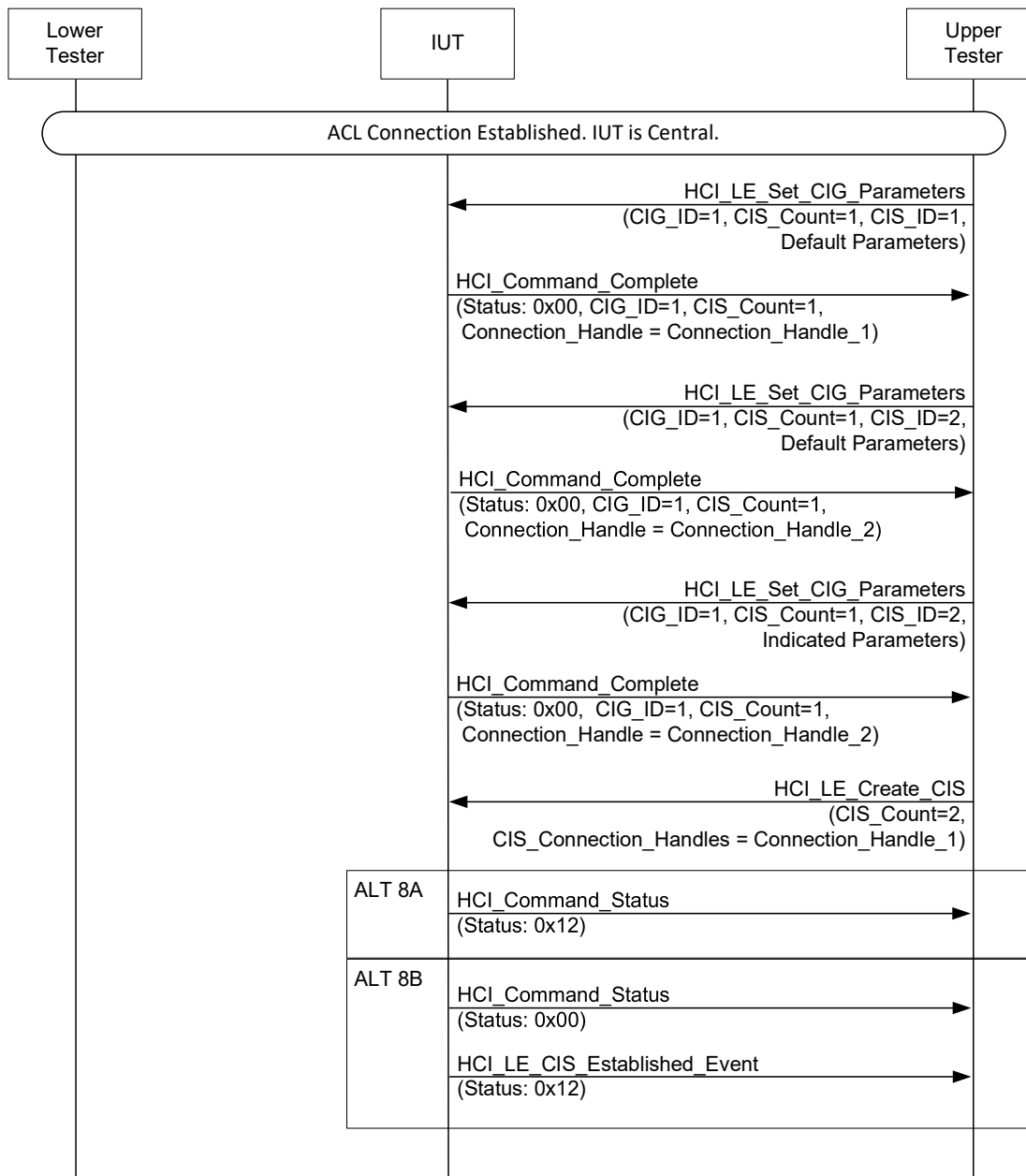


Figure 4.151: HCI/CIS/BV-05-C [Connected Isochronous Stream, Central Initiated, Add or Modify CIS] MSC – Page 1 of 2

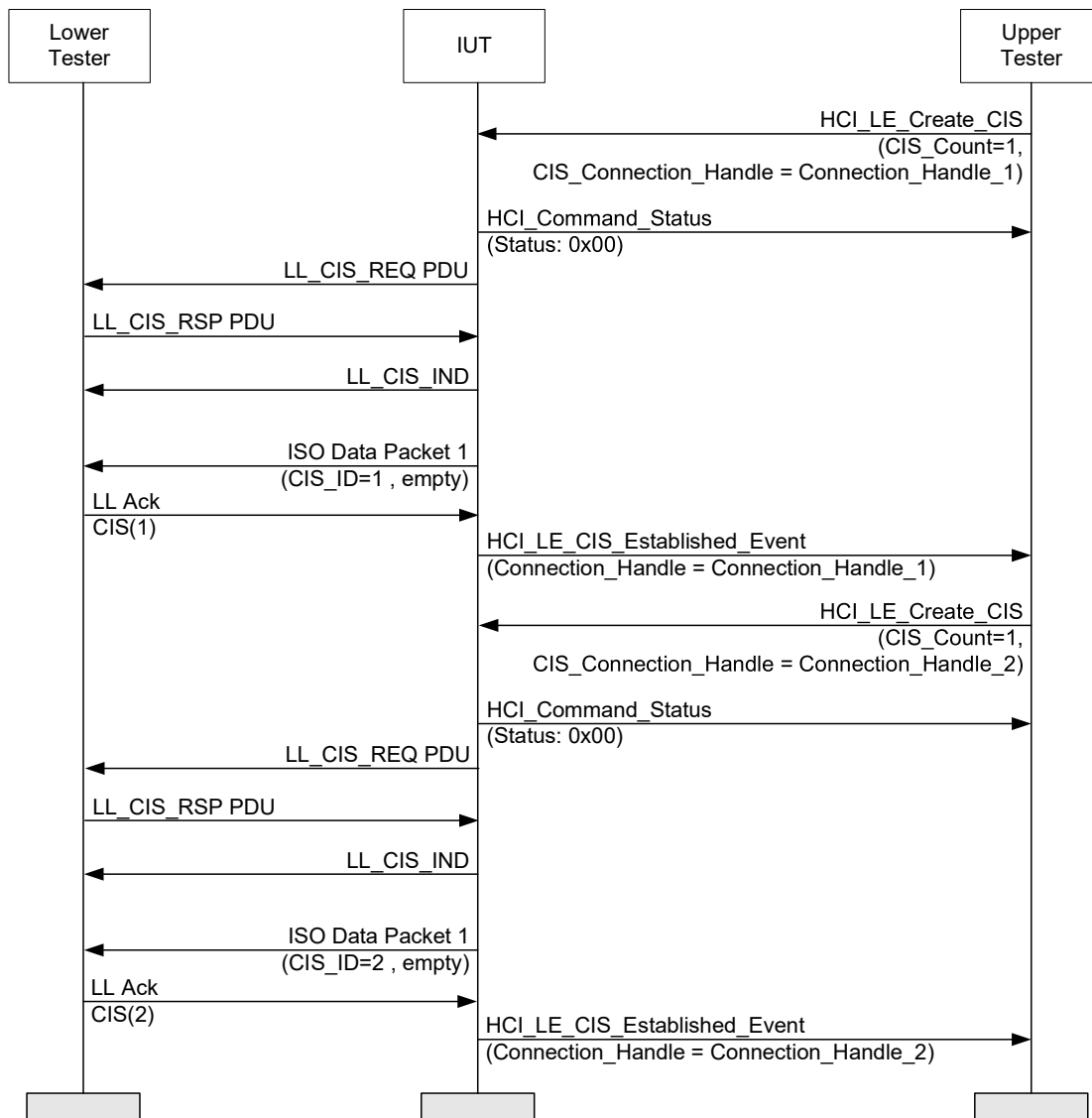


Figure 4.152: HCI/CIS/BV-05-C [Connected Isochronous Stream, Central Initiated, Add or Modify CIS] MSC – Page 2 of 2

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with the CIG_ID set to 1 and default values as specified in [15] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_1.
3. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with the CIS_ID set to 2, CIG_ID set to 1, and default values as specified in [15] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_2.
5. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with CIS_ID set to 2, CIG_ID set to 1, and the values as specified in Table 4.97.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Connection_Handle_2 received in Step 4.
7. The Upper Tester sends an HCI_LE_Create_CIS command with a CIS_Count of 2 and both connection handles set to CIS_Connection_Handle_1.

8. Perform alternative 8A or 8B depending on how the IUT rejects the HCI_LE_Create_CIS command.
 - Alternative 8A (The IUT returns an HCI_Command_Status event with an error code)
 - 8A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with the error code Invalid HCI Command Parameters (0x12).
 - Alternative 8B (The IUT returns an HCI_LE_CIS_Established event with an error code)
 - 8B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 8B.2 The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with the error code Invalid HCI Command Parameters (0x12).
9. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with a valid CIS_Connection_Handle_1 for CIS_ID 0x01.
10. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0.
11. The IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x01.
12. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
13. The IUT sends an LL_CIS_IND PDU to the Lower Tester.
14. The IUT sends an empty ISO Data packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.
15. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Connection_Handle_1 for CIS_ID 0x01.
16. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with a valid CIS_Connection_Handle_2 for CIS_ID 0x02.
17. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0.
18. The IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x02.
19. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
20. The IUT sends an LL_CIS_IND PDU to the Lower Tester.
21. The IUT sends an empty ISO Data Packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.
22. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Connection_Handle_2 for CIS_ID 0x02.

Parameter	Value
SDU_Interval_C_To_P, SDU_Interval_P_To_C	20 ms
CIS_Count	1
Peripherals_Clock_Accuracy	0
Packing	Sequential (0x00)
Framing	Unframed (0x00)
Max_SDU_C_To_P, Max_SDU_P_To_C	100
Max_Transport_Latency_C_To_P, Max_Transport_Latency_P_To_C	40 ms
RTN_C_To_P, RTN_P_To_C	4

Table 4.97: CIG Parameter Values

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Connection_Handle_1.

In Step 4, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and valid Connection_Handle_2.



In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and the Connection_Handle received in Step 4.

In Step 8, the IUT rejects the HCI_LE_Create_CIS command with the error code Invalid HCI Command Parameters (0x12).

In Step 10, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0.

In Step 11, the IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x01 and CIS parameters matching the values in Step 1.

In Step 13, the IUT sends an LL_CIS_IND PDU to the Lower Tester.

In Step 14, the IUT sends an empty ISO Data Packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.

In Step 15, the IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Connection_Handle_1 for CIS_ID 0x01.

In Step 17, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0.

In Step 18, the IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x02 and CIS parameters matching the values in Step 5.

In Step 20, the IUT sends an LL_CIS_IND PDU to the Lower Tester.

In Step 21, the IUT sends an empty ISO Data packet to the Lower Tester, and the Lower Tester sends an Ack to the IUT.

In Step 22, the IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Connection_Handle_2 for CIS_ID 0x02.

HCI/CIS/BI-05-C [Connected Isochronous Stream Using Non-Test Command, Central, Reject Invalid Parameters]

- Test Purpose

Verify that a Central IUT properly rejects invalid parameters in the LE_Set_CIG_Parameters command.

- Reference

[12] 7.8.97

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
- The Lower Tester acts in the Peripheral role.

- Test Procedure

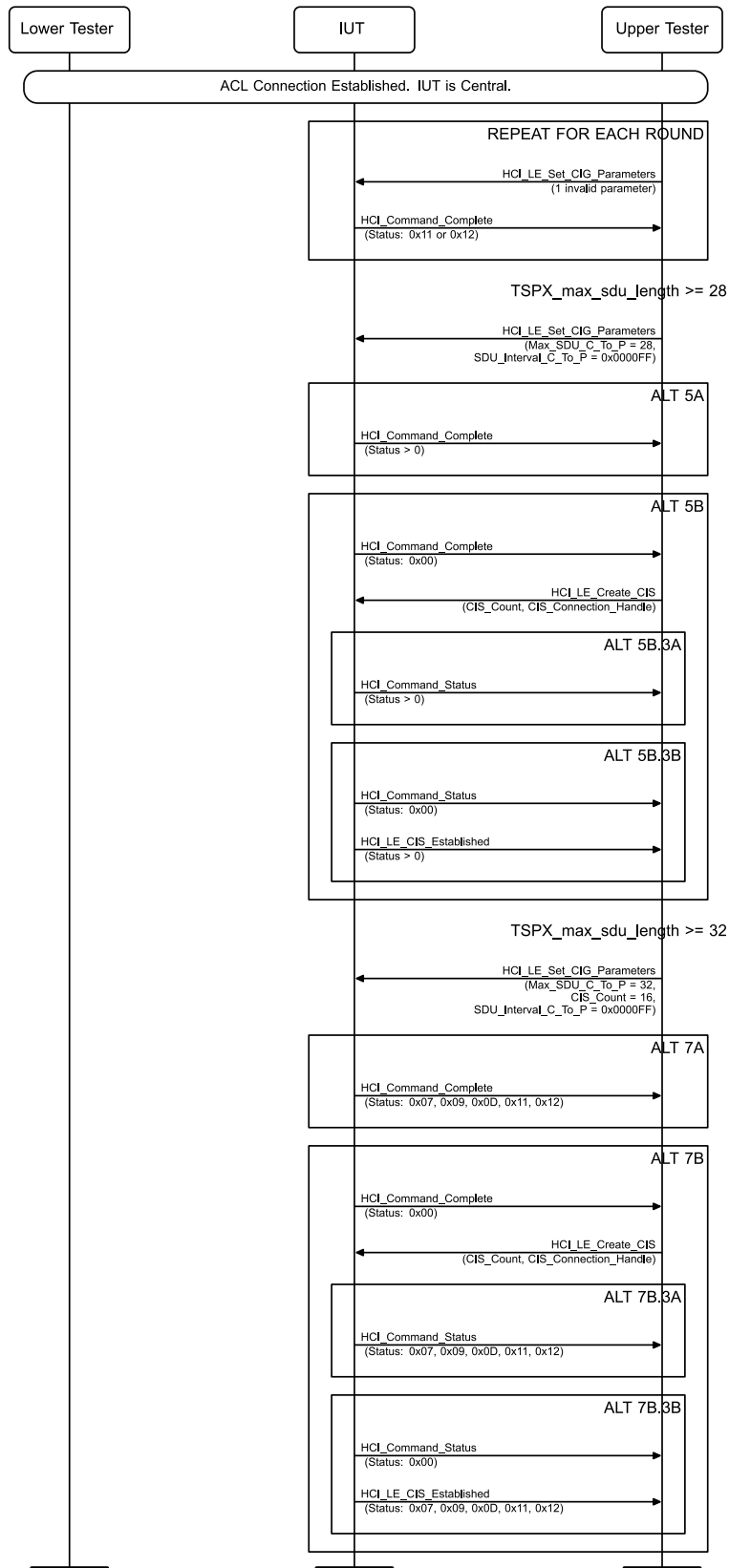


Figure 4.153: HCI/CIS/BI-05-C [Connected Isochronous Stream Using Non-Test Command, Central, Reject Invalid Parameters] MSC

1. For each round in [Table 4.98](#), the Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with one parameter set to the value specified and all other values set as specified in [Table 4.99](#).

Note: For round 7, the number of parameters required to describe the CIS_Count specified exceeds the size of an HCI command. Fill in an array of 26 valid CIS values, leaving only the CIS_Count in error.

2. The IUT then sends an HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) in rounds 11 and 12 and Invalid HCI Command Parameters (0x12) in all other rounds.
3. Return to Step 1 until all rounds are completed.
4. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with values as specified in [Table 4.99](#) except that SDU_Interval_C_To_P is set to 0x0000FF (255 μ s) and Max_SDU_C_to_P = 28.
5. Perform either alternative 5A or 5B depending on the IUT response.

Alternative 5A (non-zero status):

- 5A.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to a valid error code.

Alternative 5B (Status set to 0x00):

- 5B.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
- 5B.2 The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with CIS_Count and CIS_Connection_Handle set to the values returned in Step 5B.1.
- 5B.3 Perform either 5B.3A or 5B.3B depending on the HCI_Command_Status response.

Alternative 5B.3A (non-zero status):

- 5B.3A The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.

Alternative 5B.3B (Status set to 0x00):

- 5B.3B The IUT sends a successful HCI_Command_Status event to the Upper Tester followed by an HCI_LE_CIS_Established event with Status set to a valid error code.

6. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with Max_SDU_C_To_P = 32, SDU_Interval_C_To_P = 0x0000FF (255 μ s) and CIS_Count = 16. All other values as specified in [Table 4.99](#).
7. Perform either alternative 7A or 7B depending on the IUT response.

Alternative 7A (non-zero status):

- 7A.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to error code Invalid HCI Command Parameters (0x12), Unsupported Feature or Parameter Value (0x11), error code Memory Capacity Exceeded (0x07), error code Rejected Due to Limited Resources (0x0D), or error code Connection Limit Exceeded (0x09).

Alternative 7B (Status set to 0x00):

- 7B.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
- 7B.2 The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with CIS_Count and CIS_Connection_Handle set to the values returned in Step 7B.1.
- 7B.3 Perform either 7B.3A or 7B.3B depending on the HCI_Command_Status response.

Alternative 7B.3A (non-zero status):

- 7B.3A The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to error code Invalid HCI Command Parameters (0x12), Unsupported Feature or Parameter Value (0x11), error code Memory Capacity Exceeded (0x07), error code Rejected Due to Limited Resources (0x0D), or error code Connection Limit Exceeded (0x09).

Alternative 7B.3B (Status set to 0x00):

7B.3B The IUT sends a successful HCI_Command_Status event to the Upper Tester followed by an HCI_LE_CIS_Established event with Status set to error code Invalid HCI Command Parameters (0x12), Unsupported Feature or Parameter Value (0x11), error code Memory Capacity Exceeded (0x07), error code Rejected Due to Limited Resources (0x0D), or error code Connection Limit Exceeded (0x09).

Round	Parameter	Value
1	CIG_ID	0xFF
2	SDU_Interval_C_To_P	0xF00000
3	Worst_Case_SCA	0xF0
4	Packing	0xF0
5	Framing	0xF0
6	Max_Transport_Latency_C_To_P	0xF000
7	CIS_Count	0x20
8	CIS_ID	0xFF
9	Max_SDU_C_To_P	0xF000
10	Max_SDU_P_To_C	0xF000
11	PHY_C_To_P	0xF0
12	PHY_P_To_C	0xF0

Table 4.98: CIG Parameters for each round

Parameter	Default Value
SDU_Interval_C_To_P	20 ms
SDU_Interval_P_To_C	20 ms
CIS_Count	2 (round 4), 1 (all other rounds)
Worst_Case_SCA	0
Packing	Sequential (0x00) OR Interleaved (0x01)
Framing	Unframed (0x00)
Max_SDU_C_To_P	10
Max_SDU_P_To_C	0
PHY_C_To_P	LE 1M PHY
PHY_P_To_C	LE 1M PHY
Max_Transport_Latency_C_To_P	40 ms
Max_Transport_Latency_P_To_C	40 ms
RTN_C_To_P	2
RTN_P_To_C	2

Table 4.99: CIG Default Parameters

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) in rounds 11 and 12 and Invalid HCI Command Parameters (0x12) in all other rounds.

In Steps 5A.1, 5B.3A, and 5B.3B, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to a valid error code.

In Step 7A.1, 7B.3A, and 7B.3B, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to error code Invalid HCI Command Parameters (0x12), Unsupported Feature or Parameter Value (0x11), error code Memory Capacity Exceeded (0x07), error code Rejected Due to Limited Resources (0x0D), or error code Connection Limit Exceeded (0x09).

HCI/CIS/BV-06-C [Connected Isochronous Stream Using Test Command, Central Initiated, Time_Offset]

- Test Purpose

Verify that the Central IUT, when transmitting unframed data packets, returns a Time_Offset value of 0 when LE Read ISO TX Sync is called.

- Reference

[12] 7.8.96

- Initial Condition

- The Isochronous Channels (Host Support) FeatureSet bit is set.
- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
- The Lower Tester acts in the Peripheral role.

- Test Procedure

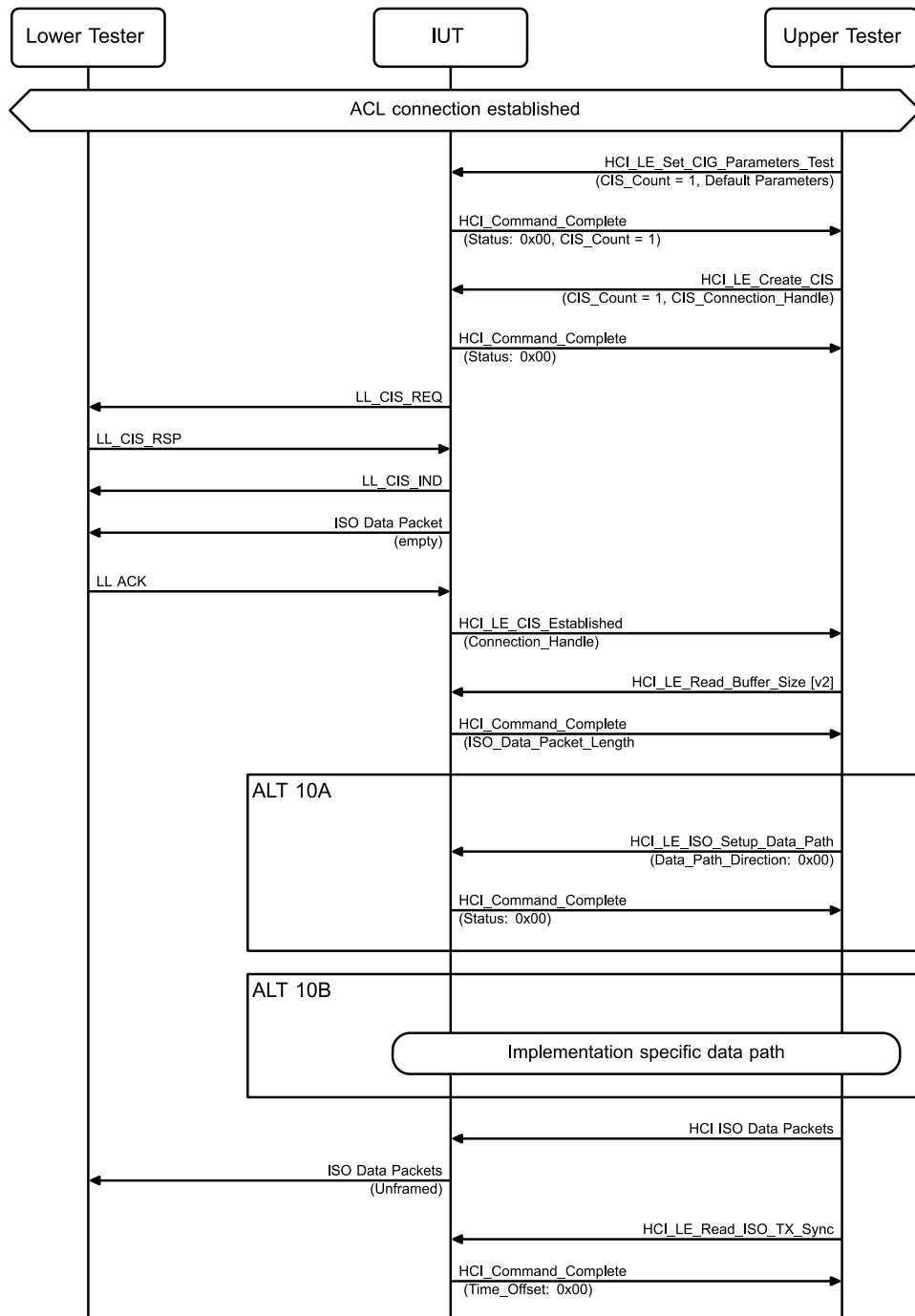


Figure 4.154: HCI/CIS/BV-06-C [Connected Isochronous Stream Using Test Command, Central Initiated, Time_Offset] MSC

1. The Upper Tester sends an `HCI_LE_Set_CIG_Parameters_Test` command to the IUT with the default parameters in [15] Section 4.10.1.3, Default Values for Set CIG Parameters Commands. The Upper Tester receives an `HCI_Command_Complete` success response from the IUT and `CIS_Count = 1`.
2. The Upper Tester sends an `HCI_LE_Create_CIS` command to create a single CIS and receives a success response from the IUT.
3. The IUT sends an `LL_CIS_REQ` PDU to the Lower Tester.

4. The Lower Tester sends an LL_CIS_RSP PDU to the IUT.
5. The IUT sends an LL_CIS_IND to the Lower Tester.
6. The IUT sends an empty ISO Data packet to the Lower Tester.
7. The Lower Tester acknowledges the empty ISO Data packet.
8. The IUT sends an HCI_LE_CIS_Established event indicating success to the Upper Tester. The Connection_Handle parameter is set to the value provided in the HCI_LE_Create_CIS command.
9. The Upper Tester sends an HCI_LE_Read_Buffer_Size [v2] command to the IUT and receives an HCI_Command_Complete event providing an ISO_Data_Packet_Length.
10. Execute alternative 10A or 10B depending on the ISO_Data_Packet_Length in Step 9.
 - Alternative 10A (ISO_Data_Packet_Length > 0):
 - 10A.1 The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command with the Data_Path_Direction set to Input (0x00) to the IUT and receives a success response.
 - Alternative 10B (ISO_Data_Packet_Length = 0):
 - 10B.1 The Upper Tester uses an implementation-specific data path for Step 11.
11. The Upper Tester sends HCI ISO Data packets over the CIS, and the Lower Tester receives unframed ISO data. The HCI ISO Data packets are no larger than the permitted size read in Step 9.
12. The Upper Tester sends an HCI_LE_Read_ISO_TX_Sync command to the IUT.
13. The IUT sends an HCI_Command_Complete event that includes the Time_Offset to the Upper Tester. The Time_Offset return parameter is 0.

- Expected Outcome

Pass verdict

The IUT provides an HCI_Command_Complete success response in Step 1.

The IUT provides an HCI_Command_Status success response in Step 2.

In Step 8, the IUT sends an HCI_LE_CIS_Established event indicating success to the Upper Tester. The Connection_Handle parameter is set to the value provided in the HCI_LE_Create_CIS command.

In Step 13, the value of the Time_Offset return parameter is 0.

4.15.1.4 Connected Isochronous Stream, Invalid LE Read ISO TX Sync Parameters

- Test Purpose

Verify that an IUT returns an error when receiving an HCI_LE_Read_ISO_TX_Sync command when the CIS is not configured to transmit from the IUT.

- Reference

[12] 7.8.96

- Initial Condition

- The IUT and the Lower Tester are connected in their respective roles in a unidirectional CIS. The IUT does not transmit data and receives data from the Lower Tester.
- IUT as Central: Max_SDU_C_To_P[] = 0x00; Max_PDU_C_To_P[] = 0x00; BN_C_To_P[] = 0x00. All other values default as specified in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
- IUT as Peripheral: Max_SDU_P_To_C[] = 0x00; Max_PDU_P_To_C[] = 0x00; BN_P_To_C[] = 0x00. All other values default as specified in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.



- Test Case Configuration

Test Case
HCI/CIS/BV-07-C [Connected Isochronous Stream, Invalid LE Read ISO TX Sync Parameters, Central]
HCI/CIS/BV-08-C [Connected Isochronous Stream, Invalid LE Read ISO TX Sync Parameters, Peripheral]

Table 4.100: Connected Isochronous Stream, Invalid LE Read ISO TX Sync Parameters test cases

- Test Procedure

1. The Upper Tester sends an HCI_LE_Read_ISO_TX_Sync command to the IUT with Connection_Handle set to the current CIS connection handle.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

HCI/CIS/BI-06-C [Invalid LE Accept or Reject CIS Request, Premature Setup ISO Data Path]

- Test Purpose

Verify that a Peripheral IUT returns an error when the Host sends an HCI_LE_Setup_ISO_Data_Path command prior to sending the HCI_LE_Accept_CIS_Request command.

Verify that a Peripheral IUT returns an error when the Host sends an HCI_LE_Accept_CIS_Request or HCI_LE_Reject_CIS_Request command with an HCI_LE_Accept_CIS_Request command in progress or with a connected CIS.

- Initial Condition

- The IUT is Peripheral.
- The event mask has been configured to allow the HCI_LE_CIS_Established [v1] and [v2] events to be passed to the Upper Tester.

- Test Procedure

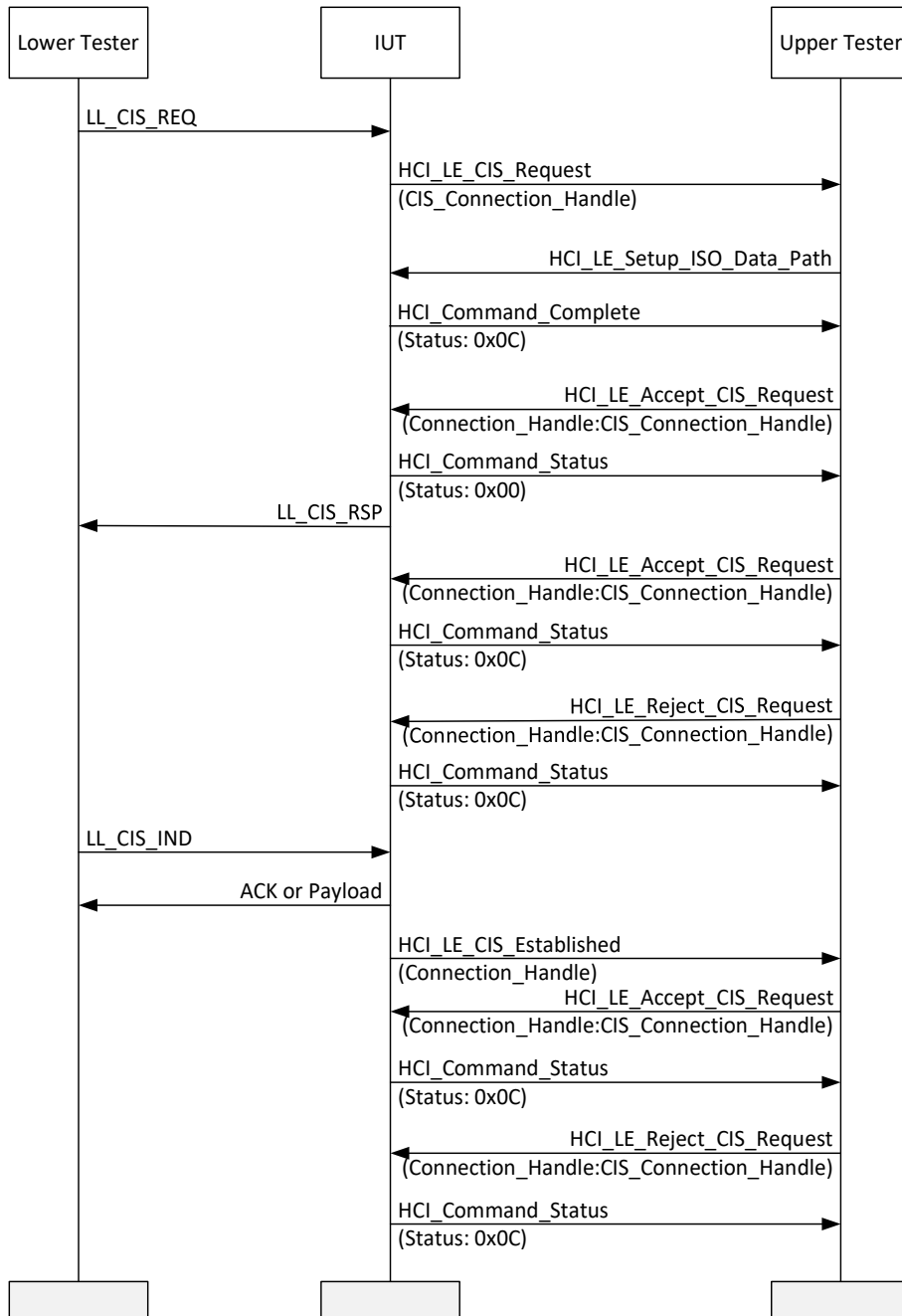


Figure 4.155: HCI/CIS/BI-06-C [Invalid LE Accept or Reject CIS Request, Premature Setup ISO Data Path] MSC

1. The Lower Tester sends an LL_CIS_REQ PDU to the IUT.
2. The IUT sends an HCI_LE_CIS_Request event to the Upper Tester with a CIS_Connection_Handle.
3. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command with Data_Path_Direction set to Output (0x01) and using the CIS_Connection_Handle provided in Step 2. The IUT responds with an HCI_Command_Complete with error code Command Disallowed (0x0C).
4. The Upper Tester sends an HCI_LE_Accept_CIS_Request command to the IUT with the Connection_Handle set to the CIS_Connection_Handle received in Step 2 and receives a successful HCI_Command_Status event in return.

5. The IUT sends an LL_CIS_RSP PDU to the Lower Tester.
 6. The Upper Tester sends an HCI_LE_Accept_CIS_Request command to the IUT with the Connection_Handle set to the CIS_Connection_Handle received in Step 2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.
 7. The Upper Tester sends an HCI_LE_Reject_CIS_Request command to the IUT with the Connection_Handle set to the CIS_Connection_Handle received in Step 2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.
 8. The Lower Tester sends an LL_CIS_IND PDU to the IUT.
 9. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with a Connection_Handle. If the IUT sends an HCI_LE_CIS_Established [v2] event, then the Sub_Interval, Max_SDU_C_To_P, Max_SDU_P_To_C, SDU_Interval_C_To_P, SDU_Interval_P_To_C, and Framing parameters are set to the corresponding values from the LL_CIS_REQ PDU sent in Step 1.
 10. The Upper Tester sends an HCI_LE_Accept_CIS_Request command to the IUT with the Connection_Handle set to the Connection_Handle received in Step 9.
 11. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.
 12. The Upper Tester sends an HCI_LE_Reject_CIS_Request command to the IUT with the Connection_Handle set to the Connection_Handle received in Step 9.
 13. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.
- Expected Outcome

Pass verdict

In Step 3, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed 0x0C.

In Steps 6, 7, 11, and 13, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C.

HCI/CIS/BI-07-C [LE CIS Request Timeout]

- Test Purpose

Verify that a Peripheral IUT returns an error when the Host fails to send an HCI_LE_Accept_CIS_Request or HCI_LE_Reject_CIS_Request command before the Connection Accept Timeout expires.
- Initial Condition
 - The IUT is Peripheral.
- Test Procedure
 1. The Lower Tester sends an LL_CIS_REQ PDU to the IUT.
 2. The IUT sends an HCI_LE_CIS_Request event to the Upper Tester with a CIS_Connection_Handle.
 3. The Upper Tester does not send an HCI_LE_Accept_CIS_Request or HCI_LE_Reject_CIS_Request within the Connection_Accept_Timeout.
 4. The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Status set to Connection Accept Timeout Exceeded (0x10).
- Expected Outcome

Pass verdict

In Step 4, the IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Status set to 0x10 after Connection_Accept_Timeout after Step 2 has elapsed.



HCI/CIS/BI-08-C [Connected Isochronous Stream, Peripheral, Reject Invalid Commands]

- **Test Purpose**
Verify that a Peripheral IUT properly rejects invalid CIS commands.
- **Reference**
[\[12\]](#) 7.8.99, 7.8.101, 7.8.109
- **Initial Condition**
 - A CIS has been established and the ISO data path has been set up. The Connection_Handle of the CIS is preserved as Connection_Handle_1.
 - The Lower Tester acts in the Central role.
- **Test Procedure**

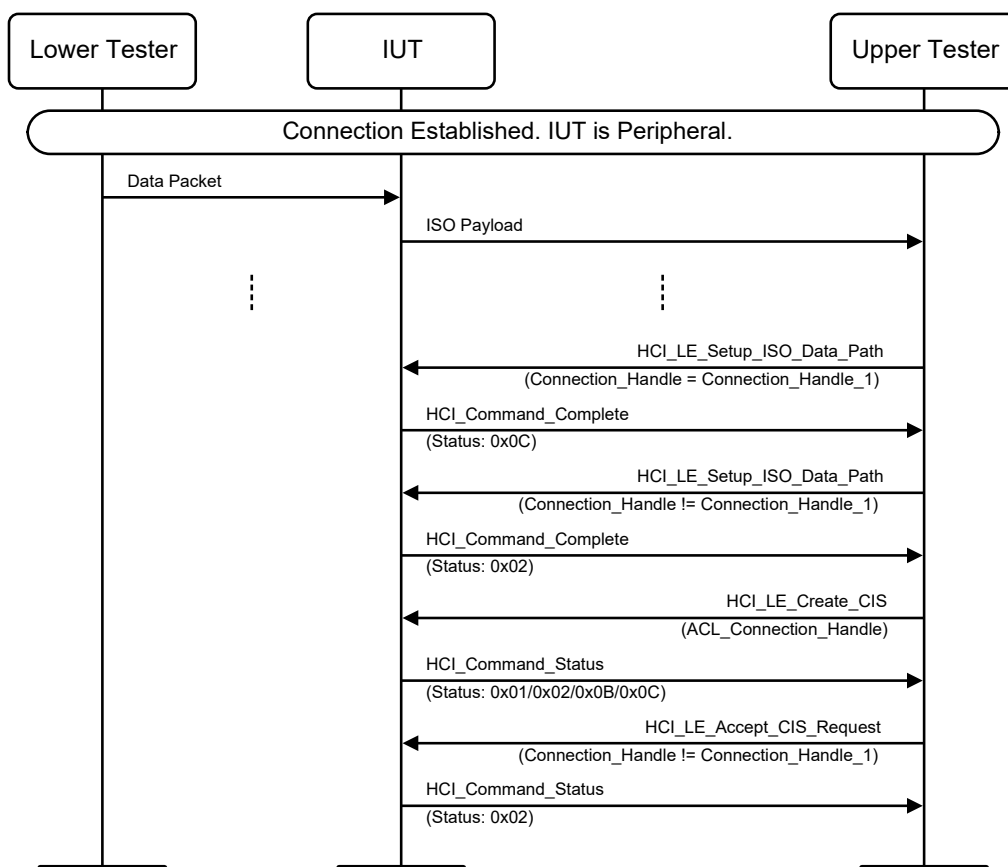


Figure 4.156: HCI/CIS/BI-08-C [Connected Isochronous Stream, Peripheral, Reject Invalid Commands] MSC

1. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with Connection_Handle set to Connection_Handle_1.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
3. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Connection_Handle set to a different value than Connection_Handle_1.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

5. The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with the ACL_Connection_Handle set to the value of the current ACL connection and CIS_Handle set to Connection_Handle_1.
6. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown HCI Command (0x01), Unknown Connection Identifier (0x02), Connection Already Exists (0x0B), or Command Disallowed (0x0C).
7. The Upper Tester sends an HCI_LE_Accept_CIS_Request to the IUT with Connection_Handle set to a different value than Connection_Handle_1.
8. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

In Step 4, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

In Step 6, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown HCI Command (0x01), Unknown Connection Identifier (0x02), Connection Already Exists (0x0B), or Command Disallowed (0x0C).

In Step 8, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

HCI/CIS/BI-09-C [Connected Isochronous Stream, Peripheral, Reject Invalid Disconnect Command]

- Test Purpose

Verify that a Peripheral IUT connecting to a CIS properly rejects a disconnect command that was received before the CIS is fully established.

- Reference

[\[12\]](#) 7.1.6

- Initial Condition

- The Isochronous Channels (Host Support) FeatureSet bit is set. The event mask has been configured to allow CIS events to be passed to the Upper Tester.
- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
- The Lower Tester is configured as the Central.

- Test Procedure

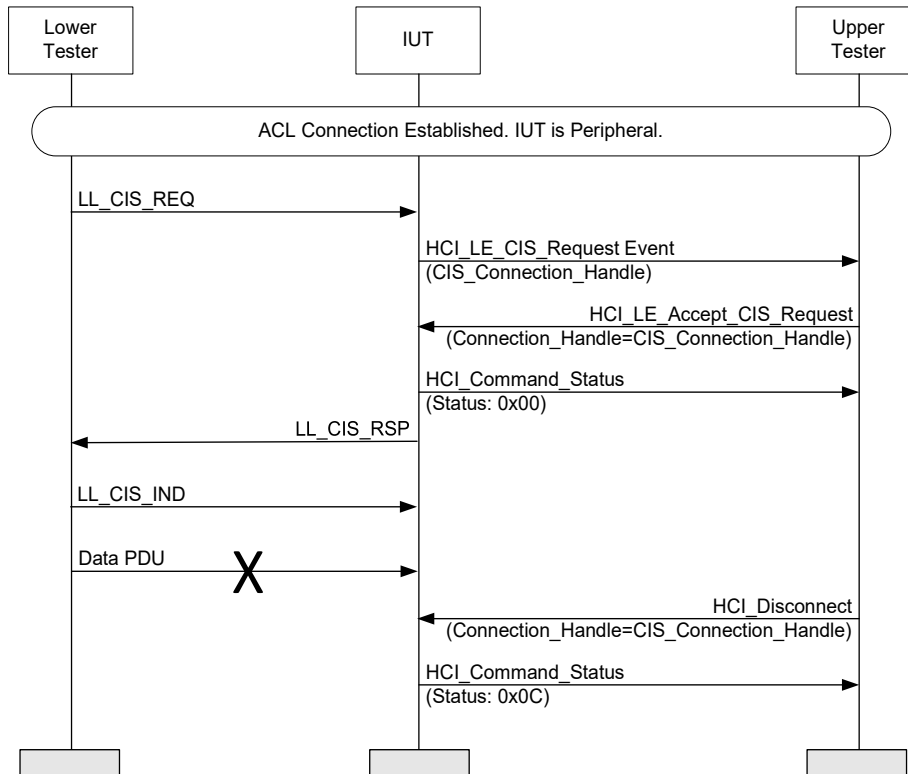


Figure 4.157: HCI/CIS/BI-09-C [Connected Isochronous Stream, Peripheral, Reject Invalid Disconnect Command] MSC

1. The Lower Tester sends an LL_CIS_REQ to the IUT with valid values.
2. The IUT sends an HCI_LE_CIS_Request event to the Upper Tester and the parameters include the CIS_Connection_Handle assigned by the IUT.
3. The Upper Tester sends an HCI_LE_Accept_CIS_Request command to the IUT, with the Connection_Handle field set to the value of the CIS_Connection_Handle received in Step 2.
4. The IUT sends a successful Command Status to the Upper Tester.
5. The IUT sends an LL_CIS_RSP PDU to the Lower Tester.
6. The Lower Tester sends an LL_CIS_IND to the IUT. The Lower Tester does not send ISO data PDUs to the IUT.
7. Before the CIS times out, the Upper Tester sends an HCI_Disconnect command to the IUT with the Connection_Handle equal to the CIS_Connection_Handle received in Step 2.
8. The IUT sends an HCI_Command_Status to the Upper Tester with Status set to error code Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_LE_CIS_Request event to the Upper Tester with the CIS_Connection_Handle assigned by the IUT.

In Step 4, the IUT sends a successful Command Status to the Upper Tester.

In Step 8, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to error code Command Disallowed (0x0C).

4.15.1.5 Connected Isochronous Stream, Time_Stamp

- Test Purpose

Verify that a Central or Peripheral IUT sets the TS_Flag bit if the ISO_Data_Load field provides a Time_Stamp to the Upper Tester over the HCI, and the bit is only set if the PB_Flag field equals 0b00 or 0b10.

Verify that a Central or Peripheral IUT provides a Time_Stamp to the Upper Tester over the HCI when time stamps are mandatory.

Verify that an Isochronous Broadcaster IUT correctly handles receiving a Time_Stamp in HCI ISO Data packets from the Upper Tester.

- Reference

[13] 5.4.5

- Initial Condition

- The IUT and the Lower Tester are connected in their respective roles as specified in Table 4.101 in a CIS using framed PDUs. All other values as defined in [14] 4.10.1.
- Peripheral IUT: The Lower Tester may request the IUT SCA if the IUT supports it in order to reduce timestamp tolerance.

- Test Case Configuration

Test Case	Role	Time_Stamp
HCI/CIS/BV-09-C	Central	Optional
HCI/CIS/BV-10-C	Peripheral	Optional
HCI/CIS/BV-11-C	Central	Mandatory
HCI/CIS/BV-12-C	Peripheral	Mandatory

Table 4.101: Connected Isochronous Stream, Time_Stamp test cases

- Test Procedure

1. The Lower Tester sends framed PDUs containing isochronous data to the IUT. The SDU data consists of octets that count from 0x00 to 0xFF and roll over back to 0x00, then the count resumes. This count continues across all SDU data.
2. The IUT sends the received data to the Upper Tester in HCI ISO Data packets.
3. The Upper Tester sends SDU data to the IUT and includes Time_Stamps in the appropriate HCI ISO Data packets. The SDU data consists of octets that count from 0x00 to 0xFF and roll over back to 0x00, then the count resumes. This count continues across all SDU data.
4. The IUT sends the SDUs provided by the Upper Tester to the Lower Tester.

- Expected Outcome

Pass verdict

When the IUT sends HCI ISO Data packets with the PB_Flag set to 0b00 or 0b10, then:

- The Packet_Sequence_Number, ISO_SDU_Length, and Packet_Status_Flag fields are present.
- If Time_Stamps are mandatory, then the TS flag is set. Otherwise, the TS flag can be set or clear.
- If the TS_Flag is set, then a valid Time_Stamp field is present. Otherwise, Time_Stamp is not present.

When the IUT sends HCI ISO Data packets with the PB_Flag set to 0b01 or 0b11, then the TS flag is clear and the Time_Stamp, Packet_Sequence_Number, ISO_SDU_Length, and Packet_Status_Flag fields are not present.

When Time_Stamps are provided, the difference between Time_Stamps of adjacent SDUs is the SDU Interval within $\pm(\text{SCA_Central} + \text{SCA_Peripheral}) * \text{ISO_Interval} \pm \text{Jitter}$.

The Lower Tester receives PDUs with data consisting of the data described in Step 3; the contents of the Upper Tester's Time_Stamp do not corrupt the contents of the data received by the Lower Tester.

The IUT sends SDUs to the Upper Tester with the contents as specified in Step 1.

HCI/CIS/BI-10-C [Connected Isochronous Stream, Central, Reject Max_SDU in Wrong Direction]

- Test Purpose

Verify that a Central IUT properly rejects Max_SDU values that conflict with existing data path directions.

- Reference

[\[13\]](#) 7.8.97

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
- The Lower Tester acts in the Peripheral role.

- Test Procedure

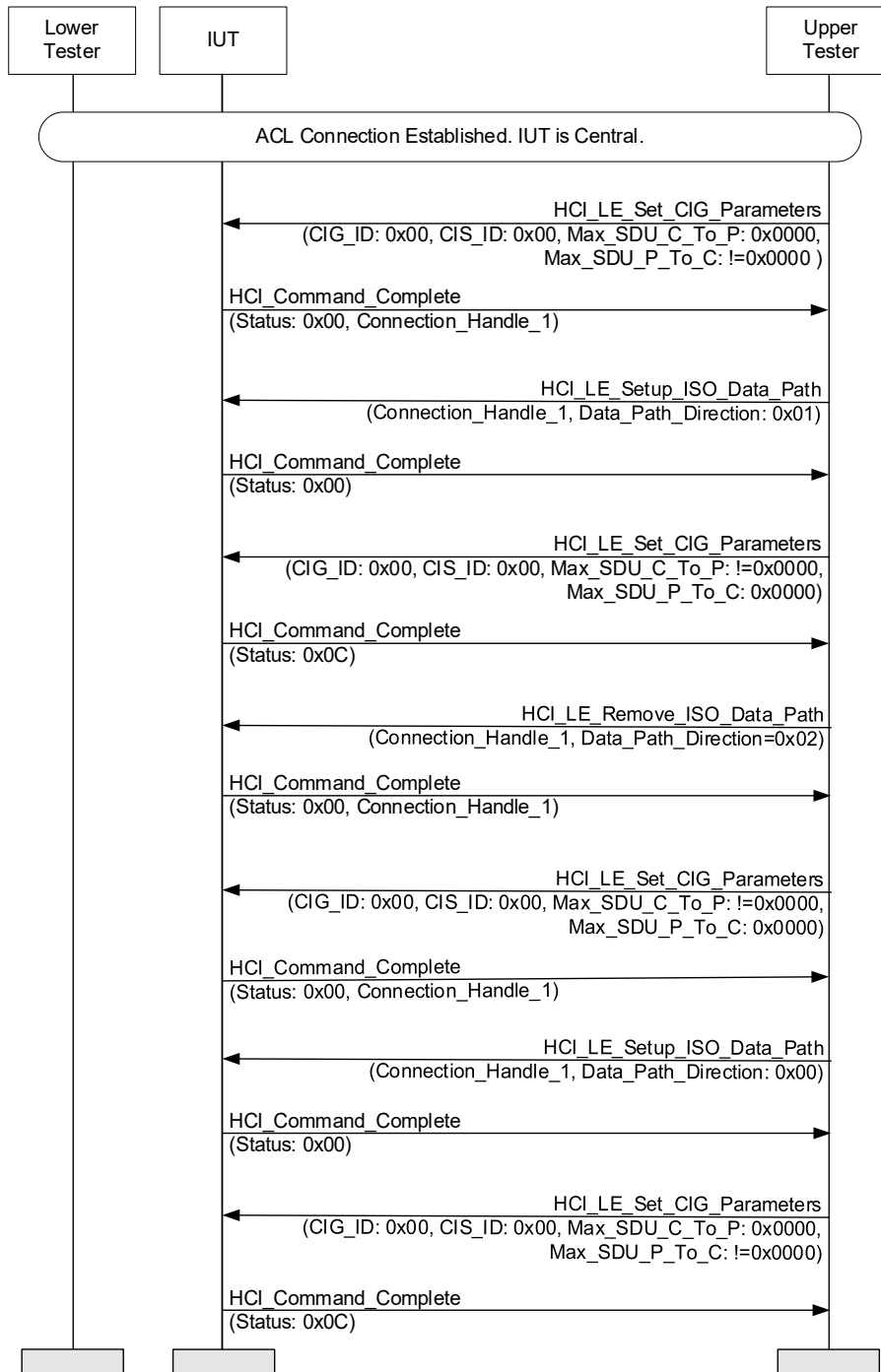


Figure 4.158: HCI/CIS/BI-10-C [Connected Isochronous Stream, Central, Reject Max_SDU in Wrong Direction] MSC

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with CIG_ID set to 0x00, CIS_ID set to 0x00, Max_SDU_P_To_C set to 42, and Max_SDU_C_To_P set to 0x0000.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_1.

3. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with Connection_Handle_1 from Step 2 and Data_Path_Direction set to 0x01 for the Output direction.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
5. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with CIG_ID set to 0x00, CIS_ID set to 0x00, and Max_SDU_P_To_C set to 0x0000, and Max_SDU_C_To_P set to 42.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
7. The Upper Tester sends an HCI_LE_Remove_ISO_Data_Path command to the IUT with Connection_Handle set to Connection_Handle_1 and Data_Path_Direction set to 0x02.
8. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Connection_Handle set to Connection_Handle_1.
9. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with CIG_ID set to 0x00, CIS_ID set to 0x00, Max_SDU_P_To_C set to 0x0000, and Max_SDU_C_To_P set to 42.
10. The IUT sends an HCI_Command_Complete to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_1.
11. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path to the IUT with Connection_Handle_1 and Data_Path_Direction set to 0x00 for the Input direction.
12. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.
13. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with CIG_ID set to 0x00, CIS_ID set to 0x00, Max_SDU_P_To_C set to 42, and Max_SDU_C_To_P set to 0x0000.
14. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_1.

In Step 4, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

In Step 8, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00 and Connection_Handle set to Connection_Handle_1.

In Step 10, the IUT sends an HCI_Command_Complete to the Upper Tester with Status set to 0x00 and a valid Connection_Handle_1.

In Step 12, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

In Step 14, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

HCI/CIS/BI-12-C [CIS Setup Procedure, Central Initiated, Invalid Transport Latency]

- Test Purpose
Verify that a Central IUT rejects the creation of a CIS with an invalid max transport latency value.
- Reference
[\[13\]](#) 7.8.97
- Initial Condition
 - The Isochronous Channels (Host Support) FeatureSet bit is set.
 - An ACL connection has been established between the IUT and the Lower Tester.
 - The Lower Tester acts in the Peripheral role.
- Test Procedure

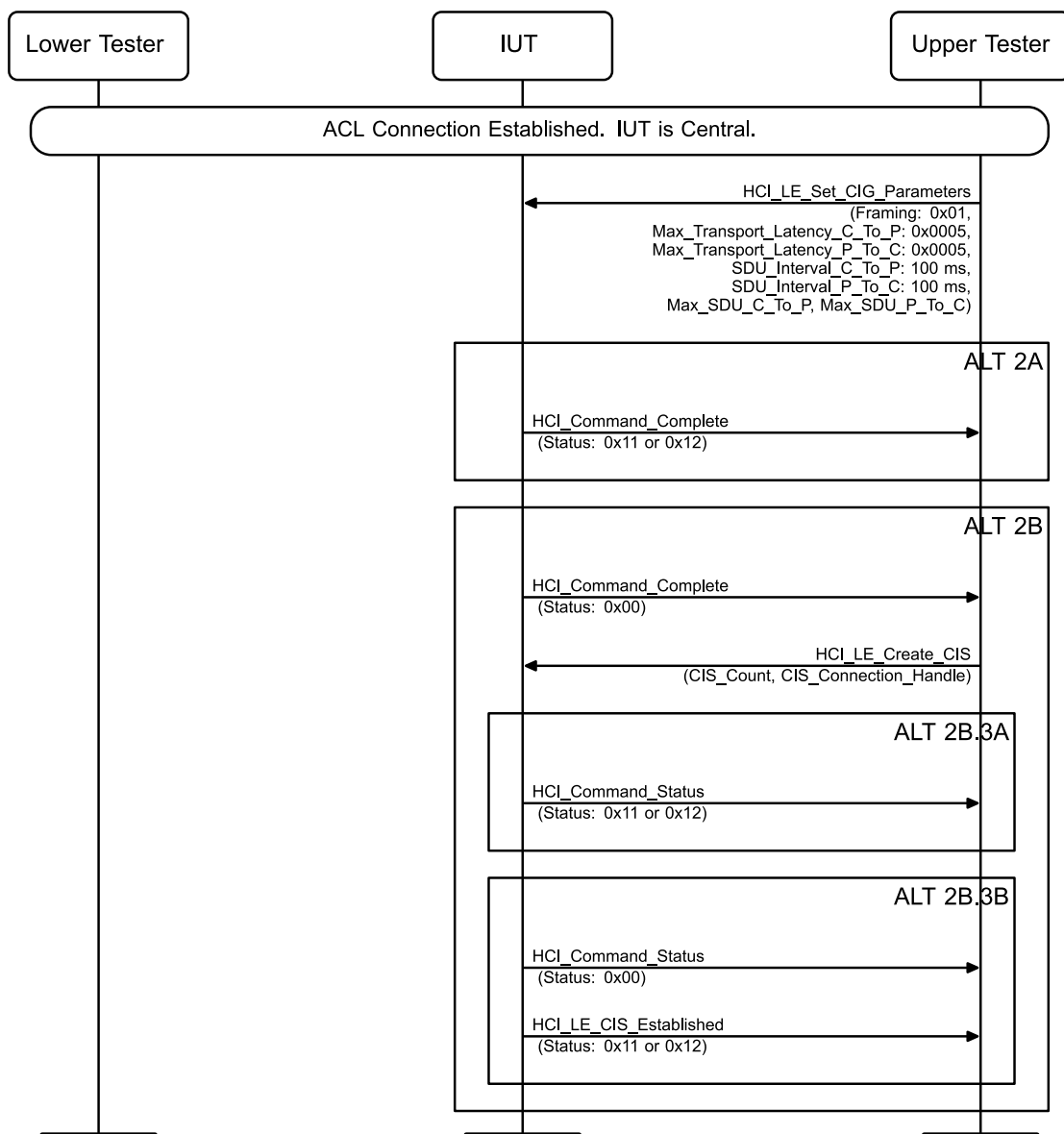


Figure 4.159: HCI/CIS/BI-12-C [CIS Setup Procedure, Central Initiated, Invalid Transport Latency] MSC

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with Framing set to 1, Max_Transport_Latency_C_To_P and Max_Transport_Latency_P_To_C set to 0x0005, SDU_Interval_C_To_P and SDU_Interval_P_To_C set to 100 ms, and Max_SDU_C_To_P and Max_SDU_P_To_C set to 384. All other values are assigned the default values specified in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
 2. Perform either alternative 2A or 2B depending on the IUT response.
 - Alternative 2A (Status set to 0x11 or 0x12):
 - 2A.1 The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12).
 - Alternative 2B (Status set to 0x00):
 - 2B.1 The IUT sends a successful HCI_Command_Complete event to the Upper Tester.
 - 2B.2 The Upper Tester sends an HCI_LE_Create_CIS command to the IUT with CIS_Count and CIS_Connection_Handle set to the values returned in Step 2B.1.
- Perform either 2B.3A or 2B.3B depending on the HCI_Command_Status response.
- 2B.3A The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12).
 - 2B.3B The IUT sends a successful HCI_Command_Status event to the Upper Tester followed by an HCI_LE_CIS_Established event with Status set to Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12).

- Expected Outcome

Pass verdict

In Step 2A.1, 2B.3A, or 2B.3B, the IUT sends an HCI event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12).

HCI/CIS/BV-13-C [Connected Isochronous Stream, Central, Removal of Configurable and Inactive CIG]

- Test Purpose

Verify that a Central IUT can remove a CIG in the configurable and inactive states.

- Reference

[13] 7.8.100

- Initial Condition

- A single CIS has been established using the values specified in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
- The Lower Tester is Peripheral.

- Test Procedure

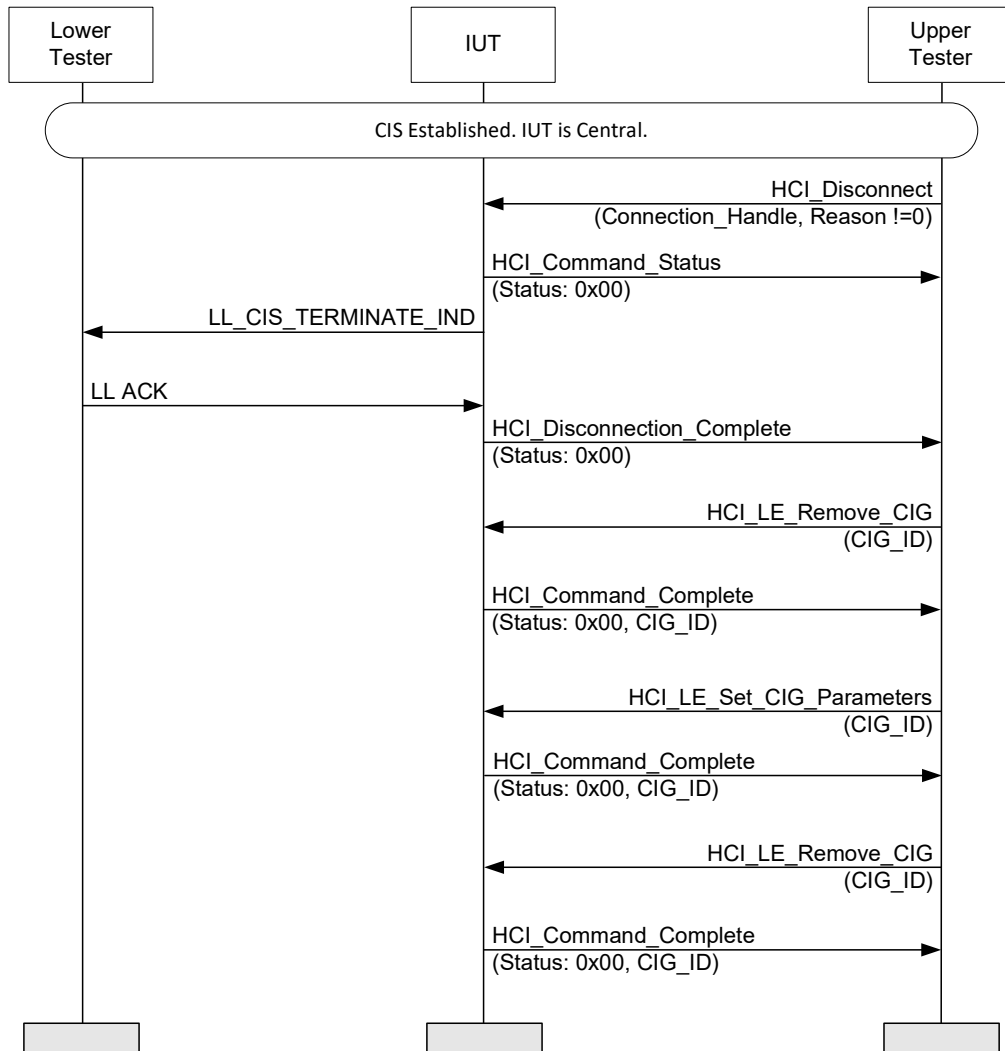


Figure 4.160: HCI/CIS/BV-13-C [Connected Isochronous Stream, Central, Removal of Configurable and Inactive CIG] MSC

1. The Upper Tester sends an HCI_Disconnect command to the IUT with Connection_Handle set to the current CIS_Connection_Handle and Reason set to any valid value, and it receives a successful HCI_Command_Status in response.
2. The IUT sends an LL_CIS_TERMINATE_IND PDU to the Lower Tester.
3. The Lower Tester sends an LL Ack to the IUT.
4. The IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Status set to 0x00, Connection_Handle set to the CIS_Connection_Handle in Step 1, and Reason set to a valid value.
5. The Upper Tester sends an HCI_LE_Remove_CIG command to the IUT with CIG_ID set to the value of CIG_ID in Step 1.
6. The IUT sends the Upper Tester an HCI_Command_Complete event with CIG_ID set to the CIG_ID in Step 1 and Status set to 0x00.
7. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with values as stated in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands, and receives a successful HCI_Command_Complete event in response.

8. The Upper Tester sends an HCI_LE_Remove_CIG command to the IUT with CIG_ID set to the CIG_ID value in Step 7.
9. The IUT sends an HCI_Command_Complete event to the Upper Tester with CIG_ID set to the value in Step 7 and Status set to 0x00.

- Expected Outcome

Pass verdict

In Step 1, the IUT sends a successful HCI_Command_Status to the Upper Tester.

In Step 4, the IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Status set to 0x00, Connection_Handle set to the CIS_Connection_Handle in Step 1, and Reason set to a valid value.

In Step 6, the IUT sends the Upper Tester an HCI_Command_Complete event with CIG_ID set to the CIG_ID in Step 1 and Status set to 0x00.

In Step 9, the IUT sends an HCI_Command_Complete event to the Upper Tester with CIG_ID set to the value in Step 7 and Status set to 0x00.

HCI/CIS/BI-13-C [Connected Isochronous Stream, Central, Reject Parameter Change of Inactive CIG]

- Test Purpose

Verify that a Central IUT properly rejects the LE_Setup_CIG_Parameters command (the non-test variant) used on an inactive Connected Isochronous Stream.

- Reference

[13] 7.8.97

- Initial Condition

- A single CIS has been established using the values specified in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
- The Lower Tester is Peripheral.

- Test Procedure

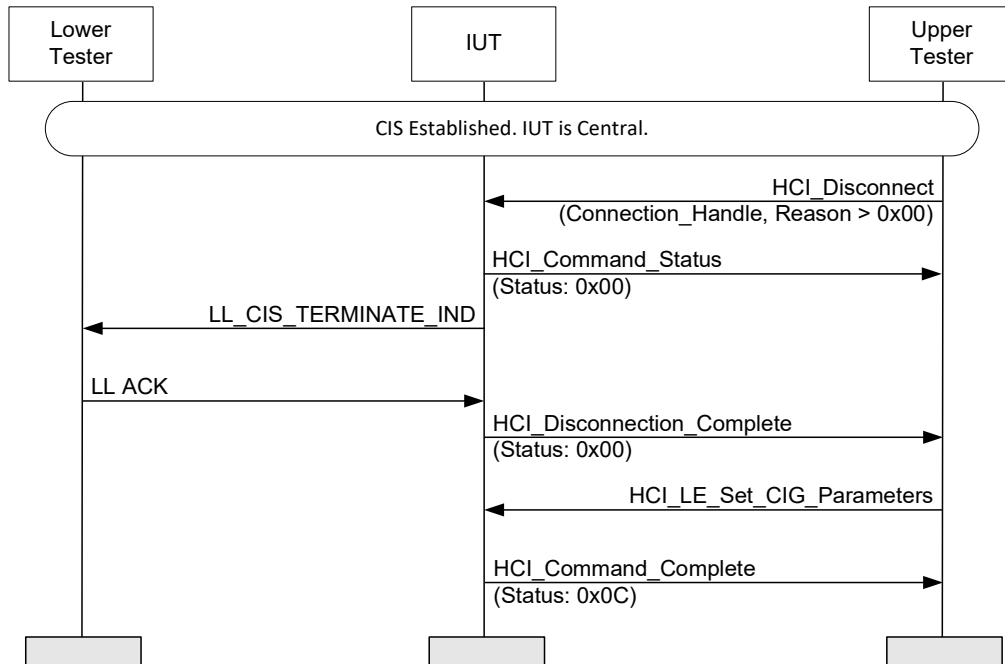


Figure 4.161: HCI/CIS/BI-13-C [Connected Isochronous Stream, Central, Reject Parameter Change on Inactive CIG] MSC

1. The Upper Tester sends an HCI_Disconnect command to the IUT with Connection_Handle set to the current CIS_Connection_Handle and Reason set to any valid value, and it receives a successful HCI_Command_Status in response.
2. The IUT sends an LL_CIS_TERMINATE_IND PDU to the Lower Tester.
3. The Lower Tester sends an LL Ack to the IUT.
4. The IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Status set to 0x00, Connection_Handle set to the CIS_Connection_Handle, and Reason set to a valid value.
5. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with values as stated in [14] Section 4.10.1.3, Default Values for Set CIG Parameters Commands.
6. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

- Expected Outcome

Pass verdict

In Step 1, the IUT sends a successful HCI_Command_Status to the Upper Tester.

In Step 4, the IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Status set to 0x00, Connection_Handle set to the CIS_Connection_Handle, and Reason set to a valid value.

In Step 6, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

4.15.1.6 Verify CIS Features Not Supported

- Test Purpose

Verify that an IUT does not support CIS features that are marked as unsupported features. The Upper Tester attempts to set CIG parameters that use the unsupported features, expecting the IUT to return an error.

- Reference

[7] 4.5.13

[12] 7.8.98

- Initial Condition

- An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.

- Test Case Configuration

Test Case	HCI Parameters
HCI/CIS/BI-14-C [Verify CIS Features Not Supported, BN > 1]	BN_C_To_P = 2 BN_P_To_C = 2
HCI/CIS/BI-15-C [Verify CIS Features Not Supported, FT > 1]	FT_C_TO_P = 2 FT_P_TO_C = 2

Table 4.102: Verify CIS Features Not Supported test cases

- Test Procedure

For each entry in the HCI Parameters in [Table 4.102](#):

1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters_Test command to the IUT with that parameter set as specified in [Table 4.102](#) and the remaining parameters (including any others listed in [Table 4.102](#)) as valid parameters.
2. The IUT sends an HCI_Command_Complete event with Error set to 0x11 (Unsupported Feature or Parameter Value).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an error code of 0x11 to the IUT.

[HCI/CIS/BI-16-C \[Disconnecting Immediately After a Failed Create CIS Attempt\]](#)

- Test Purpose

Verify that a Central IUT properly responds when an Upper Tester attempts to disconnect a connection after a failed CIS creation attempt. The Upper Tester sends an HCI_Disconnect after the IUT sends the failed HCI_LE_CIS_Established event.

- Reference

[13] 7.1.6, 7.8.99

- Initial Condition
 - An ACL connection has been established between the IUT and the Lower Tester with a valid Connection Handle.
 - The Lower Tester acts in the Peripheral role.
- Test Procedure

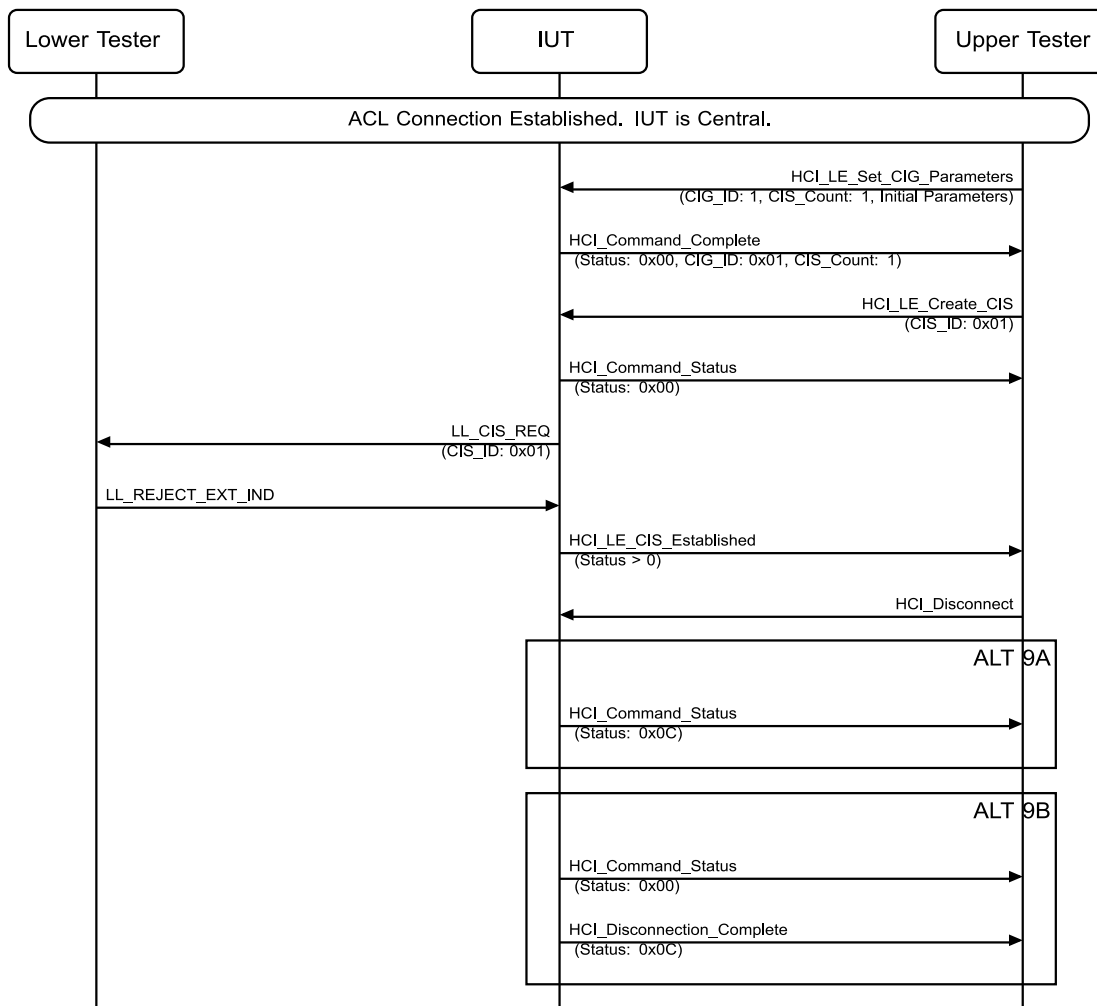


Figure 4.162: HCI/CIS/BI-16-C [Disconnecting Immediately After a Failed Create CIS Attempt] MSC

- The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with the values specified in the Initial Value(s) column in [Table 4.103](#).
- The IUT sends an HCI_Command_Complete event to the Upper Tester with Status = 0x00, CIG_ID = 0x01, and CIS_Count = 1.
- The Upper Tester sends an HCI_LE_Create_CIS command to the IUT for CIS_ID 0x01.
- The IUT sends an HCI_Command_Status event to the Upper Tester with Status = 0x00.
- The IUT sends an LL_CIS_REQ PDU to the Lower Tester with CIS_ID set to 0x01.
- The Lower Tester sends an LL_REJECT_EXT_IND PDU to the IUT.
- The IUT sends an HCI_LE_CIS_Established event to the Upper Tester with Status > 0.
- The Upper Tester sends an HCI_Disconnect command to the IUT.

9. Perform alternative 9A or 9B depending on the HCI_Command_Status response.

Alternative 9A (HCI_Command_Status = 0x0C):

- 9A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Alternative 9B (Successful HCI_Command_Status):

- 9B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
9B.2 The IUT sends an HCI_Disconnection_Complete event to the Upper Tester with Status set to 0x0C (Command Disallowed).

Parameter	Initial Value(s)
CIG_ID	0x01
SDU_Interval_C_To_P, SDU_Interval_P_To_C	50 ms
CIS_Count	1
CIS_ID[]	0x01
Worst_Case_SCA	0x00
Packing	Sequential (0x00)
Framing	Framed (0x01)
Max_SDU_C_To_P[]	16
Max_SDU_P_To_C[]	16
Max_Transport_Latency_C_To_P, Max_Transport_Latency_P_To_C	200 ms
RTN_C_To_P[]	4
RTN_P_To_C[]	4
PHY_C_To_P[]	0x01
PHY_P_To_C[]	0x01

Table 4.103: CIG Parameter Values

- Expected Outcome

Pass verdict

In Steps 9A.1 or 9B.2, the IUT sends an event with Error Code 0x0C.

HCI/CIS/BV-14-C [Number of Completed Packets Event after Sending data in Unidirectional CIS]

- Test Purpose

Verify that the IUT properly sends the HCI Number of Completed Packets event after the IUT sends Isochronous data to a device in the Connected Isochronous Group.

- Reference

[13] 7.7.19

- Initial Condition

- The maximum number of CISes in a CIG is defined in the TSPX_max_cis_per_cigs IXIT value.
- A CIG with TSPX_max_cis_per_cigs CISes has been established between the IUT and the Lower Tester with Max_SDU set to 4, BN set to 1, and FT set to 1 in each direction for each CIS. The remaining parameters are the defaults specified in [14] Section 4.10.1.3 Default Values for Set

CIG Parameters Commands but may be adjusted if necessary to establish the CIG. The IUT can be in either role.

- The input data path (Host to Controller) for each CIS is set up to receive data over HCI.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Read_Buffer_Size [v2] command to the IUT.
2. The IUT sends a successful HCI_Command_Complete event with an ISO_Data_Packet_Length and Total_Num_ISO_Data_Packets.
3. Let $n = \text{Total_Num_ISO_Data_Packets}$ from Step 2.
4. Throughout the remaining steps:
 - a) The IUT sends either CIS Null PDUs or the data from the HCI ISO Data packets in Step 7 to the Lower Tester.
 - b) If the Lower Tester is the Central, then it sends CIS Null PDUs to the IUT in each CIS sub-event within the CIG.
 - c) Whenever the IUT sends an HCI_Number_Of_Completed_Packets event to the Upper Tester, increase n by the sum of the Num_Completed_Packets[i] values in the event for those values of i where Connection_Handle[i] refers to a CIS. Ignore those values of i where Connection_Handle[i] does not refer to a CIS.
5. Perform Steps 6–9 a total of 10 times.
6. Perform Steps 7–9 for each CIS in a random order (different each time).
7. If n is zero, wait until n is non-zero.
8. The Upper Tester sends an HCI ISO Data packet to the IUT containing an SDU of length 4 octets and the correct connection handle for the CIS.
9. Decrement n by 1.
10. Wait for 10 seconds.

- Expected Outcome

Pass verdict

For each CIS, the sum of the Num_Completed_Packets[i] where Connection_Handle[i] refers to that CIS equals 10.

$n = \text{Total_Num_ISO_Data_Packets}$ from Step 2.

Fail verdict

After Step 10 completes, n does not equal Total_Num_ISO_Data_Packets from Step 2.

HCI/CIS/BI-18-C [LE Set CIG Parameters, Framed, Unsegmented Mode Unsupported]

- Test Purpose

Verify that the IUT that does not support Framed, Unsegmented mode returns an error in response to the HCI_LE_Set_CIG_Parameters command.

- Reference

[19] 7.8.97

- Initial Condition

- An ACL connection has been established between the IUT and Lower Tester with a valid Connection Handle.

- Test Procedure
 1. The Upper Tester sends an HCI_LE_Set_CIG_Parameters command to the IUT with Framing set to 0x02.
 2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11.

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an Unsupported Feature or Parameter Value error.

4.15.1.7 Connected Isochronous Stream, HCI Read/Write Authenticated Payload Timeout error

- Test Purpose

Verify that an IUT rejects the Read or Write Authenticated Payload Timeout command applied to a CIS.

- Initial Condition

- The IUT is in the role specified in [Table 4.104](#).
- The Lower Tester and the IUT have established an encrypted ACL connection.
- A CIS has been established using values as specified in [\[14\]](#) Section 4.10.1.3, Default Values for Set_CIG_Parameters_Test Commands, and the Upper Tester does not provide SDU data.
- The Lower Tester is in the peer role to the IUT.

- Test Case Configuration

Test Case	Role	Reference
HCI/CIS/BI-19-C [Connected Isochronous Stream, Central]	Central	[12] 7.3.93, 7.3.94
HCI/CIS/BI-20-C [Connected Isochronous Stream, Peripheral]	Peripheral	[12] 7.3.93, 7.3.94

Table 4.104: Connected Isochronous Stream, HCI Read/Write Authenticated Payload Timeout error test cases

- Test Procedure

1. The Upper Tester sends the HCI_Read_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the CIS.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.
3. The Upper Tester sends the HCI_Write_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the CIS.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Steps 2 and 4, the IUT sends an 0x0C error to the Upper Tester.

4.15.2 Broadcast Isochronous Streams

Verify the correct implementation of the Broadcast Connected Isochronous Stream commands and events.

HCI/BIS/BI-08-C [Invalid LE BIG Create Sync Parameters and LE ISO Remove Data Path behavior, BIS]

- Test Purpose

Verify that the IUT properly handles invalid parameters for the LE BIG Create Sync command. Also verify that the LE IUT properly handles the LE ISO Remove Data Path command being called by the Upper Tester before the ISO Data Path is properly set, and the IUT rejects a request to terminate a BIS when the IUT is a Synchronized Receiver.

- Reference

[12] 5.4.5

- Initial Condition

- The IUT is configured in the passive scanning state. The Lower Tester is in the advertising state.
- The IUT is synchronized to the Lower Tester Periodic Advertising.
- The Lower Tester establishes a BIG with the values in [Table 4.105](#).

Variable	Value(s)
num_bis	2
sdu_int	200 ms
iso_int	200 ms
nse	1
mx_sdu	32
mx_pdu	32
phy	LE 1M PHY
packing	0x00
framing	0x00
bn	1
irc	1
pto	0
Encryption	0x00
broadcast_code	TSPX_broadcast_code

Table 4.105: BIS Configuration

- Test Procedure

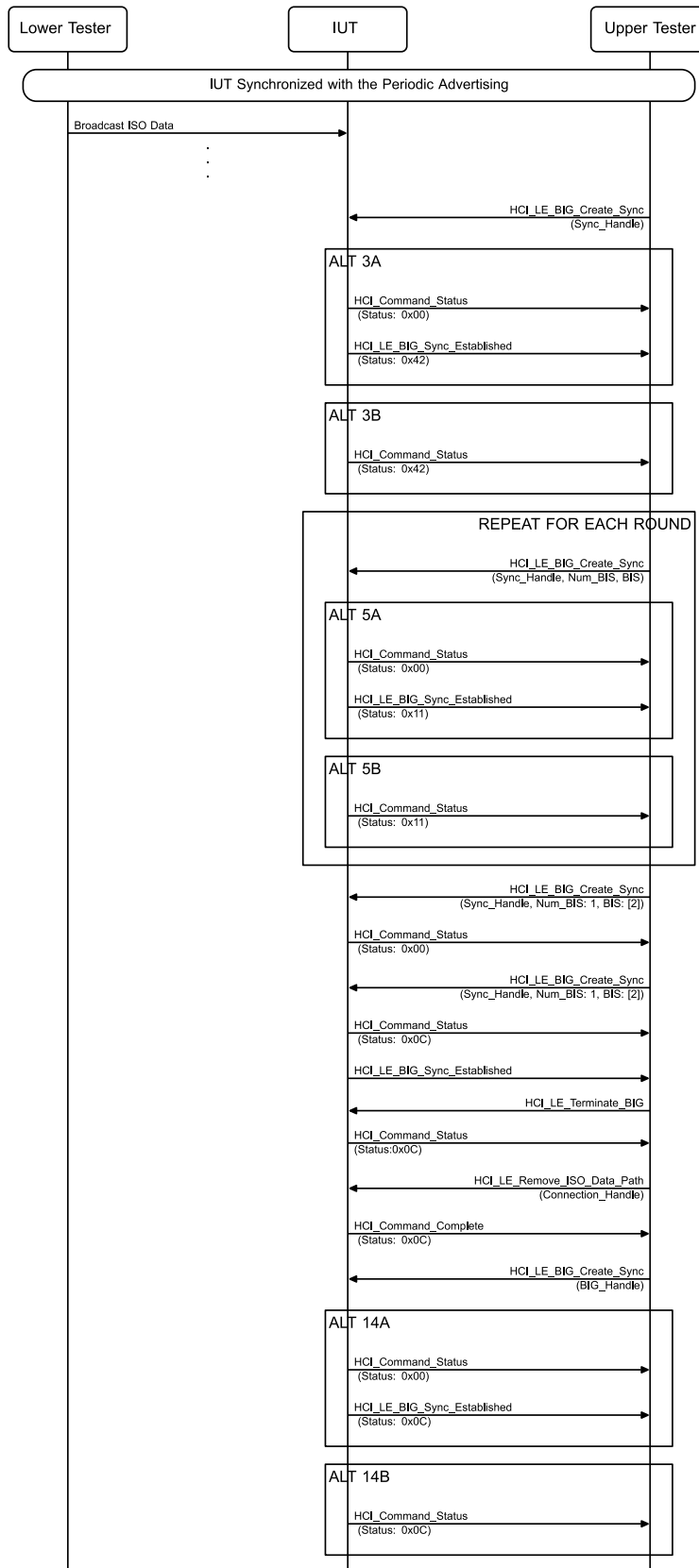


Figure 4.163: HCI/BIS/BI-08-C [Invalid LE BIG Create Sync Parameters and LE ISO Remove Data Path behavior, BIS] MSC

1. The Lower Tester broadcasts the Broadcast ISO Data packets to the IUT.
 2. The Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT with an invalid Sync_Handle.
 3. Perform either alternative 3A or 3B depending on the value returned in the HCI_Command_Status event.
 - Alternative 3A (Successful HCI_Command_Status event):
 - 3A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 3A.2 The IUT sends an HCI_LE_BIG_Sync_Established event with Status set to Unknown Advertising Identifier (0x42).
 - Alternative 3B (HCI_Command_Status event with an error):
 - 3B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unknown Advertising Identifier (0x42).
- Repeat Steps 4 and 5 for each round in [Table 4.106](#).
4. The Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT with the correct Sync_Handle and with Num_BIS and the BIS set as specified in [Table 4.106](#).
 5. Perform either alternative 5A or 5B depending on the value returned in the HCI_Command_Status event.
 - Alternative 5A (Successful HCI_Command_Status event):
 - 5A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 5A.2 The IUT sends an HCI_LE_BIG_Sync_Established event with Status set to the error in [Table 4.106](#).
 - Alternative 5B (HCI_Command_Status event with an error):
 - 5B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to the error in [Table 4.106](#).
 6. The Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT with the correct Sync_Handle, Num_BIS set to 0x01, and BIS set to [2] and receives a successful HCI_Command_Status in response.
 7. Immediately after Step 6, the Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT with the same values as in Step 6.
 8. The IUT sends an HCI_Command_Status command to the Upper Tester with Status set to Command Disallowed (0x0C).
 9. The IUT syncs with the BIG and sends a successful HCI_LE_BIG_Sync_Established event to the Upper Tester.
 10. The Upper Tester sends an HCI_LE_Terminate_BIG command to the IUT, and the IUT responds with Command Disallowed (0x0C).
 11. The Upper Tester sends an HCI_LE_Remove_ISO_Data_Path command to the IUT with Connection_Handle set to the connection handle of the BIS.
 12. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
 13. The Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT using the same BIG_Handle as the established BIG.
 14. Perform either alternative 14A or 14B depending on the value returned in the HCI_Command_Status event.
 - Alternative 14A (Successful HCI_Command_Status event):
 - 14A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 14A.2 The IUT sends an HCI_LE_BIG_Sync_Established event with Status set to Command Disallowed (0x0C).
 - Alternative 14B (HCI_Command_Status event with an error):
 - 14B.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Command Disallowed (0x0C).

Round	Num_BIS	BIS	HCI Error
1	3	[1, 2, 3]	0x11, 0x0D
2	1	[3]	0x11
3	1	[0]	0x12

Table 4.106: Invalid LE BIG Create Sync Parameters and LE ISO Remove Data Path behavior, BIS rounds

- Expected Outcome

Pass verdict

In Step 3, the IUT sends an Unknown Advertising Identifier (0x42) error to the Upper Tester.

In Step 5, the IUT sends an event with Status set to the error in Table 4.106 to the Upper Tester. In round 1, error Rejected Due To Limited Resources (0x0D) is allowed if TSPX_max_tx_bises = 2.

In Steps 8, 10, 12, 14A.2, and 14B.1, the IUT sends a Command Disallowed (0x0C) error to the Upper Tester.

HCI/BIS/BI-09-C [Invalid LE BIG Create Sync Encryption Parameter, BIS]

- Test Purpose

Verify that the IUT properly rejects when the Upper Tester attempts to sync to the BIG when the encryption is the opposite of the BIG encryption type.

- Reference

[12] 7.8.106

- Initial Condition

- The IUT is configured in the passive scanning state. The Lower Tester is in the advertising state.
- The IUT is synchronized to the Lower Tester Periodic Advertising.

- Test Procedure

Repeat Steps 1–3 for each round in Table 4.107.

- The Lower Tester establishes a BIG with the values in Table 4.105 except that Encryption is set as specified in Table 4.107.
- The Upper Tester sends an HCI_LE_BIG_Create_Sync command to the IUT with Encryption set as specified in Table 4.107.
- Perform either alternative 3A or 3B depending on the value returned in the HCI_Command_Status event.
 - Alternative 3A (Successful HCI_Command_Status event):
 - The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - The IUT sends an HCI_LE_BIG_Sync_Established event with Status set to Encryption Mode Not Acceptable (0x25).
 - Alternative 3B (HCI_Command_Status event with an error):
 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Encryption Mode Not Acceptable (0x25).

Round	Lower Tester BIG Encrypted	Upper Tester Encryption Parameter
1	Yes	0x00 (Broadcast_Code invalid)
2	No	0x01 (Broadcast_Code valid)

Table 4.107: Invalid LE BIG Create Sync Encryption Parameter rounds



- Expected Outcome

Pass verdict

In Step 3, the IUT sends an Encryption Mode Not Acceptable (0x25) error.

HCI/BIS/BI-16-C [Reporting Failure to Sync to BIS]

- Test Purpose

Verify that a Synchronized Receiver IUT correctly reports failure to synchronize to BIS.

- Reference

[\[1\]](#) 7.8.106

- Initial Condition

- The IUT is a Synchronized Receiver.
- The Lower Tester is an Isochronous Broadcaster and broadcasts periodic advertising streams over the LE 1M PHY. The periodic advertising includes BIGInfo, but the BIS that BIGInfo would point to is never broadcast.

- Test Procedure

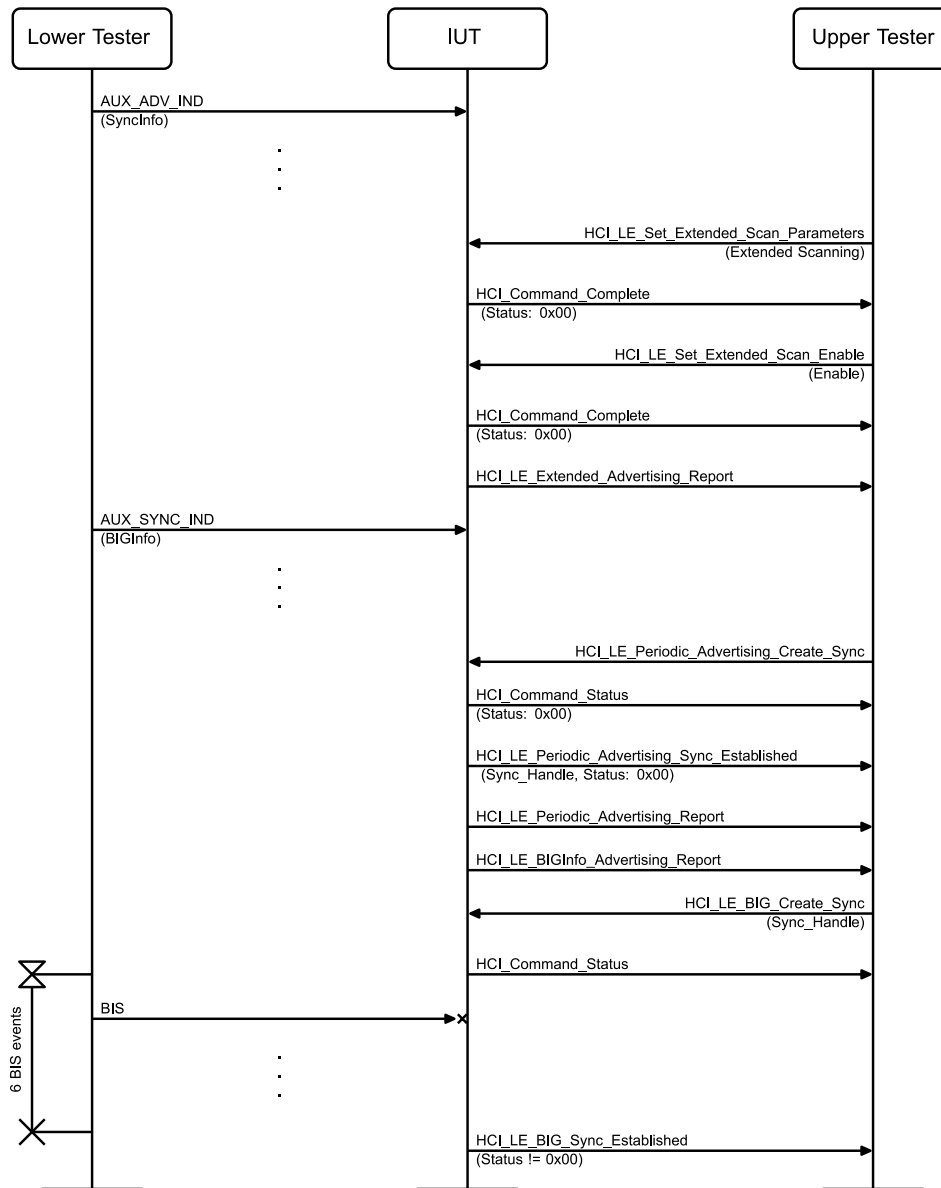


Figure 4.164: HCI/BIS/BI-16-C [Reporting Failure to Sync to BIS] MSC

1. The Upper Tester sends an `HCI_LE_Set_Extended_Scan_Parameters` command to the IUT using the LE 1M PHY and receives a successful `HCI_Command_Complete` in response.
2. The Upper Tester sends an `HCI_LE_Set_Extended_Scan_Enable` command to the IUT to enable scanning and receives a successful `HCI_Command_Complete` in response.
3. The IUT sends an `HCI_LE_Extended_Advertising_Report` event to the Upper Tester.
4. The Upper Tester sends an `HCI_LE_Periodic_Advertising_Create_Sync` command to the IUT to synchronize with the Lower Tester's periodic advertisements. The Upper Tester receives an `HCI_Command_Status` event in response.
5. The IUT sends a successful `HCI_LE_Periodic_Advertising_Sync_Established` event to the Upper Tester. The event returns a `Sync_Handle` as one of its parameters.
6. The IUT sends an `HCI_LE_Periodic_Advertising_Report` event to the Upper Tester.
7. Immediately following sending an `HCI_LE_Periodic_Advertising_Report` to the Upper Tester, the IUT sends an `HCI_LE_BIGInfo_Advertising_Report` event.

8. The Upper Tester orders the IUT to synchronize to the Lower Tester's presumed BIG described in BIGInfo by sending an HCI_LE_BIG_Create_Sync command using the Sync_Handle returned in the HCI_LE_Periodic_Advertising_Sync_Established event and receives an HCI_Command_Status event in response.
9. After six BIS events, the IUT sends an HCI_LE_BIG_Sync_Established event to the Upper Tester with the Status field set to an error, which can be Connection Failed to be Established / Synchronization Timeout (0x3E).

- Expected Outcome

Pass verdict

The IUT provides the event to the Upper Tester as described in Step 9.

4.15.2.1 Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster

- Test Purpose

Verify that the IUT correctly executes the LE Create BIG Command (the non-test variant) and correctly handles error conditions.

- Reference

[12] 7.8.103, 7.8.109

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser.
- TSPX_max_tx_bises is the Max Supported TX NumBIS, as defined in IXIT.
- TSPX_max_iso_pkt is the ISO Max Data Packet Length, as defined in IXIT.
- TSPX_max_periodic_adv_train is the maximum number of periodic advertising trains, as defined in IXIT.

- Test Case Configuration

Test Case	Step 19 performed
HCI/BIS/BV-01-C [Broadcast Isochronous Stream Using Non-Test Command, all PHYs]	No
HCI/BIS/BV-02-C [Broadcast Isochronous Stream Using Non-Test Command, not all PHYs]	Yes

Table 4.108: Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster test cases

- Test Procedure

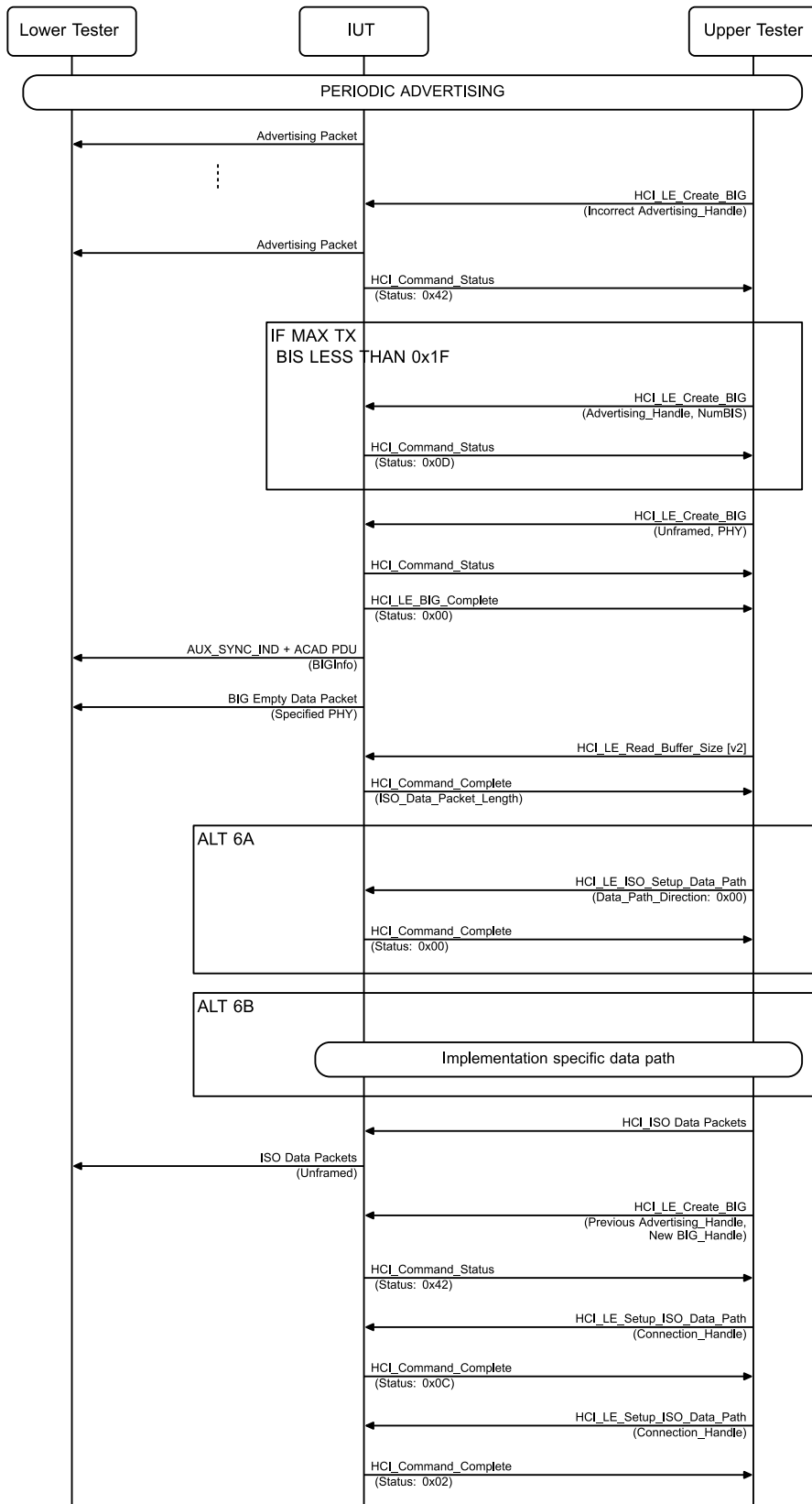


Figure 4.165: Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster MSC – Page 1 of 2

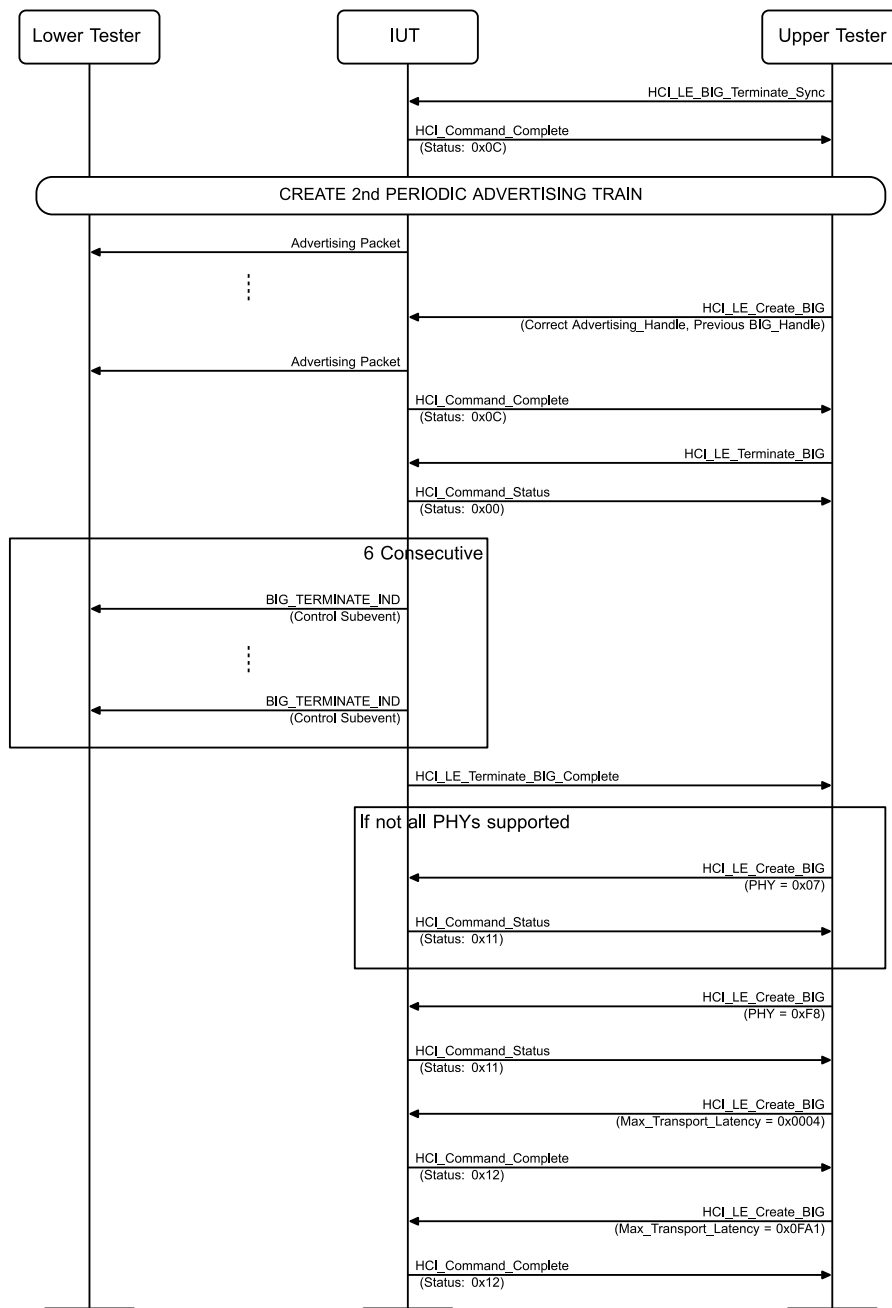


Figure 4.166: Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster MSC – Page 2 of 2

1. The Upper Tester sends an HCI_LE_Create_BIG command using an Advertising_Handle that does not identify a periodic advertising train and the IUT returns error code Unknown Advertising Identifier (0x42).
2. If TSPX_max_tx_bises is less than 0x1F, then the Upper Tester sends an HCI_LE_Create_BIG command using the correct Advertising_Handle obtained previously and the Num_BIS field set to TSPX_max_tx_bises plus 1. The IUT returns the error code Rejected due to Limited Resources (0x0D) to the Upper Tester.
3. The Upper Tester sends an HCI_LE_Create_BIG command using the correct Advertising_Handle obtained previously. The frame bit is set to 0b0 and encryption is disabled. The Upper Tester receives a successful HCI_Command_Status event in return.

4. The Upper Tester receives an HCI_LE_Create_BIG_Complete event from the IUT. The PHY matches the PHY used to create the BIG.
5. The Upper Tester sends an HCI_LE_Read_Buffer_Size [v2] command and the IUT responds with an HCI_Command_Complete event providing an ISO_Data_Packet_Length that matches TSPX_max_iso_pkt.
6. Execute alternative 6A or 6B depending on the ISO_Data_Packet_Length in Step 5.
 - Alternative 6A (ISO_Data_Packet_Length > 0):
 - 6A.1 The Upper Tester sets up Isochronous data paths on the IUT by sending an HCI_LE_Setup_ISO_Data_Path command to the IUT and receives a successful HCI_Command_Complete in response.
 - Alternative 6B (ISO_Data_Packet_Length = 0):
 - 6B.1 The Upper Tester uses an implementation-specific data path for Step 7.
7. The Upper Tester begins sending HCI ISO Data Packets to the IUT. The data size is less than the maximum buffer size as read from the IUT.
8. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle used to create the previous BIG but a different BIG_Handle. The IUT returns the error code Unknown Advertising Identifier (0x42) to the Upper Tester.
9. If the ISO_Data_Packet_Length in Step 5 is > 0, the Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with Connection_Handle and Direction as in Step 6.
10. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
11. If the ISO_Data_Packet_Length in Step 5 is > 0, the Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with Connection_Handle set to an invalid value.
12. If the ISO_Data_Packet_Length in Step 5 is > 0, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).
13. The Upper Tester sends an HCI_LE_BIG_Terminate_Sync command with the correct BIG_Handle and expects the IUT to respond with Status parameter Command Disallowed (0x0C) if the IUT supports the Synchronized Receiver role feature; otherwise, with Unknown Command.
14. If TSPX_max_periodic_adv_train is 1, the test ends with a Pass verdict; otherwise, the Upper Tester commands the IUT to open a second periodic advertising train.
15. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle created in the previous step but using the BIG_Handle from the BIG previously created. The IUT returns the error code Command Disallowed (0x0C) to the Upper Tester.
16. The Upper Tester sends an HCI_LE_Terminate_BIG command using the BIG_Handle of the existing BIG to the IUT and receives an HCI_Command_Status event in response.
17. The Upper Tester receives an HCI_LE_Terminate_BIG_Complete event from the IUT.
18. If this step is performed (see [Table 4.108](#)), the Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle created in Step 14 and sets PHY=0x07. The IUT returns the error code Unsupported Feature or Parameter value (0x11) to the Upper Tester.
19. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle created in Step 14 and sets PHY=0xF8. The IUT returns the error code Unsupported Feature or Parameter value (0x11) to the Upper Tester.
20. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle created in Step 14 and sets Max_Transport_Latency to 0x0004. The IUT returns the error code Invalid HCI Command Parameters (0x12) to the Upper Tester.
21. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle created in Step 14 and sets Max_Transport_Latency to 0x0FA1. The IUT returns the error code Invalid HCI Command Parameters (0x12) to the Upper Tester.

- Expected Outcome

Pass verdict

In Step 1, the IUT returns error code Unknown Advertising Identifier (0x42).

In Step 2, the IUT returns error code Rejected due to Limited Resources (0x0D).

In Step 4, the Upper Tester receives an HCI_LE_Create_BIG_Complete event from the IUT.

In Step 5, the IUT broadcasts BIS Empty Data Packets.

In Step 5, the ISO_Data_Packet_Length matches TSPX_max_iso_pkt.

In Step 8, the IUT returns the error code Unknown Advertising Identifier (0x42).

The IUT refuses to terminate the BIG when the Upper Tester sends an HCI_LE_BIG_Terminate_Sync command, responding with Status parameter Command Disallowed (0x0C).

In Step 10, the IUT returns the error code Command Disallowed (0x0C).

In Step 12, the IUT returns the error code Unknown Connection Identifier (0x02).

In Step 15, the IUT returns the error code Command Disallowed (0x0C).

In Step 17, the IUT returns an HCI_LE_Terminate_BIG_Complete event to the Upper Tester.

If the IUT does not support all PHYs, then in Step 18 the IUT returns the error code Unsupported Feature or Parameter value (0x11).

In Step 19, the IUT returns the error code Unsupported Feature or Parameter value (0x11).

In Steps 20–21, the IUT returns the error code Invalid HCI Command Parameters (0x12).

HCI/BIS/BI-01-C [Ignoring RFU Bits in HCI ISO Data Packets, BIS]

- Test Purpose

Verify that the IUT ignores RFU bits in ISO Data Packets received from the Upper Tester and sends the ISO data when broadcasting a BIS.

- Reference

[12] 5.4.5

- Initial Condition

- BIS established per the following configuration and broadcast by the IUT, with the Lower Tester synchronized to the BIS:

Variable	Value(s)
num_bis	1
sdu_int	100 ms
iso_int	100 ms
nse	3
mx_sdu	8
mx_pdu	8
phy	LE 1M PHY
packing	any supported

Variable	Value(s)
framing	any
bn	1
irc	3
pto	0
encryption	any supported
broadcast_code	any supported

Table 4.109: BIS Configuration

- Test Procedure

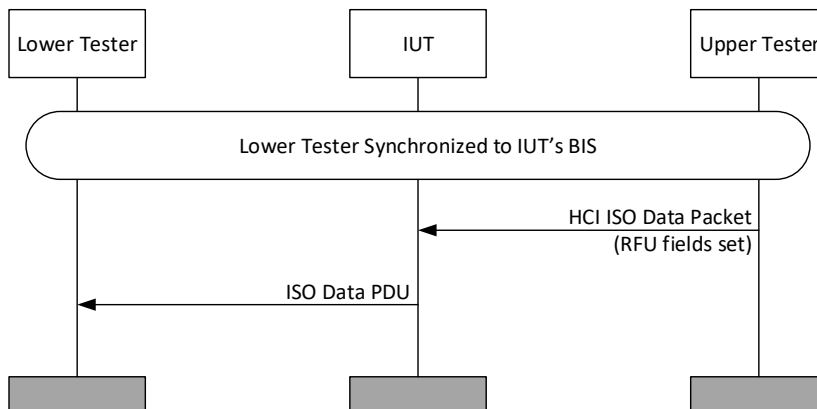


Figure 4.167: HCI/BIS/BI-01-C [Ignoring RFU Bits in HCI ISO Data Packets, BIS] MSC

1. The Upper Tester sends HCI ISO Data packets to the IUT with all RFU field bits set.
2. The IUT broadcasts the ISO Data packets to the Lower Tester.

- Expected Outcome

Pass verdict

The IUT broadcasts the ISO Data packets to the Lower Tester.

HCI/BIS/BV-03-C [Broadcast Isochronous Stream Using Test Command, Time_Offset]

- Test Purpose

Verify that an Isochronous Broadcaster IUT, when sending unframed data packets, returns a Time_Offset value of 0 when LE Read ISO TX Sync is called.

- Reference

[12] 7.8.103

- Initial Condition

- The Isochronous Broadcaster IUT is advertising periodic advertising using selected parameters compatible with the default BIG values as defined in [15] Section 4.11.1, Common Parameters.

- Test Procedure

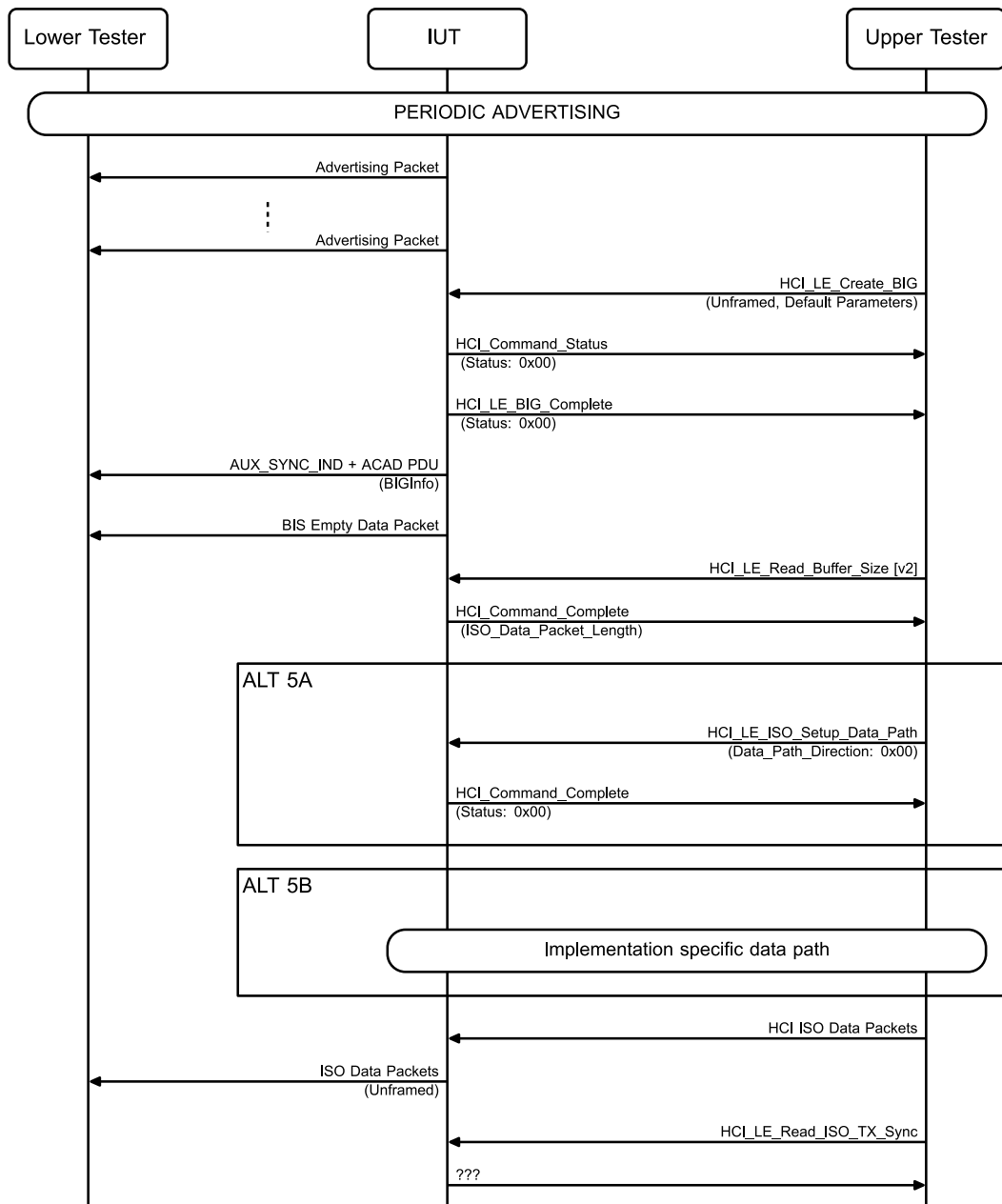


Figure 4.168: HCI/BIS/BV-03-C [Broadcast Isochronous Stream Using Test Command, Time_Offset] MSC

1. The Upper Tester sends an HCI_LE_Create_BIG_Test command to the IUT. The frame bit is set to 0b0, encryption is disabled, and NumBIS = 1. All other parameters set to default values as defined in [15] Section 4.11.1, Common Parameters. The Upper Tester receives an HCI_Command_Status event in return.
2. The IUT sends a successful HCI_LE_Create_BIG_Complete event to the Upper Tester.
3. The IUT sends advertising PDUs (AUX_SYNC_IND+ACAD) to the Lower Tester and BIS Empty Data packets.
4. The Upper Tester sends an HCI_LE_Read_Buffer_Size [v2] command, and the IUT responds with an HCI_Command_Complete event providing an ISO_Data_Packet_Length.

5. Execute alternative 5A or 5B depending on the ISO_Data_Packet_Length in Step 4.
Alternative 5A (ISO_Data_Packet_Length > 0):
 - 5A.1 The Upper Tester sets up Isochronous data paths on the IUT by sending an HCI_LE_Setup_ISO_Data_Path command with the Data_Path_Direction set to Input (0x00) to the IUT.
 Alternative 5B (ISO_Data_Packet_Length = 0):
 - 5B.1 The Upper Tester uses an implementation-specific data path for Steps 6 and 7.
6. The Upper Tester begins sending HCI ISO Data packets to the IUT. The data size is the lesser of Default_Data_Size, Unframed as defined in [15] Section 4.11.1, Common Parameters, and the maximum buffer size as previously read from the IUT.
7. The IUT sends ISO Data packets to the Lower Tester. The data packets are unframed.
8. The Upper Tester sends an HCI_LE_Read_ISO_TX_Sync command to the IUT.
9. The IUT sends an HCI_Command_Complete event that includes the Time_Offset to the Upper Tester. The value of the Time_Offset return parameter is 0.

- Expected Outcome

Pass verdict

In Step 1, the IUT sends a successful HCI_Command_Status to the Upper Tester.

In Step 2, the IUT sends a successful HCI_LE_Create_BIG_Complete event to the Upper Tester.

In Step 9, the value of the Time_Offset return parameter is 0.

HCI/BIS/BV-04-C [Broadcast Isochronous Stream, Invalid LE Read ISO TX Sync Parameters]

- Test Purpose

Verify that a Synchronized Receiver IUT returns an error when receiving an HCI_LE_Read_ISO_TX_Sync command.

- Reference

[12] 7.8.96

- Initial Condition

- The Synchronized Receiver IUT is synchronized to a BIS with a Lower Tester acting as an Isochronous Broadcaster.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Read_ISO_TX_Sync command to the IUT with Connection_Handle set to the current ACL connection handle.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

HCI/BIS/BI-02-C [Broadcast Isochronous Stream, Synchronized Receiver, Reject Invalid Commands]

- Test Purpose

Verify that the Synchronized Receiver IUT can correctly reject invalid LE Setup ISO Data Path commands.

- Reference

[12] 7.8.109

- Initial Condition

- The Lower Tester broadcasts a BIS in a BIG, and the IUT has synchronized to it.

- Test Procedure

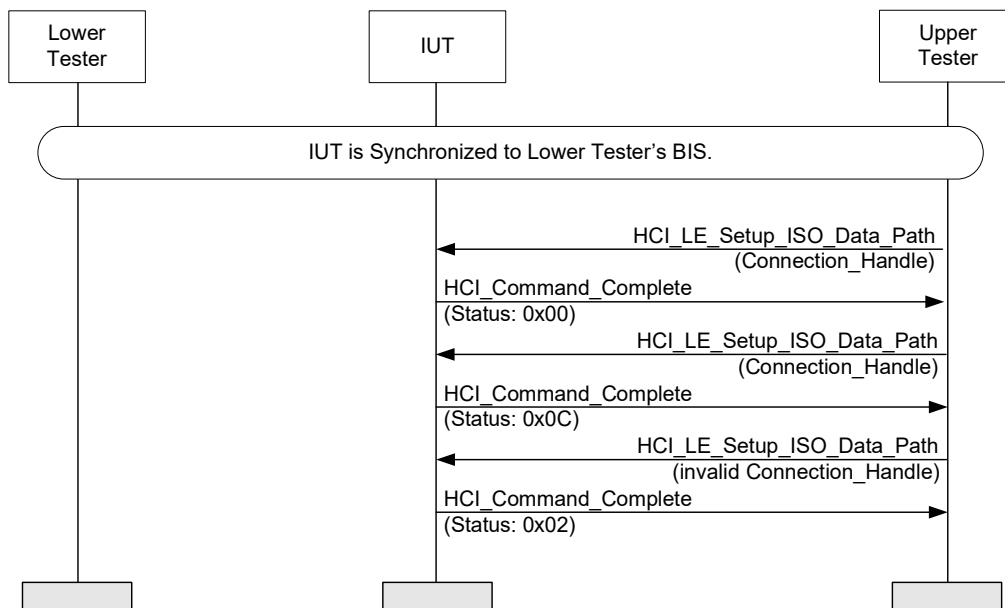


Figure 4.169: HCI/BIS/BI-02-C [Broadcast Isochronous Stream, Synchronized Receiver, Reject Invalid Commands] MSC

1. The Upper Tester creates an ISO output data path by sending an HCI_LE_Setup_ISO_Data_Path command with the Connection_Handle of the active BIS to the IUT, and the IUT sends a successful HCI_Command_Complete event in return.
2. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the same Connection_Handle from Step 1.
3. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).
4. The Upper Tester sends an HCI_LE_Setup_ISO_Data_Path command to the IUT with the Connection_Handle set to an invalid value.
5. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

- Expected Outcome

Pass verdict

In Step 1, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x00.

In Step 3, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Command Disallowed (0x0C).

In Step 5, the IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to Unknown Connection Identifier (0x02).

HCI/BIS/BV-05-C [Broadcast Isochronous Stream, Time_Stamp, Isochronous Broadcaster]

- Test Purpose

Verify that an Isochronous Broadcaster IUT correctly handles receiving a Time_Stamp in HCI ISO Data packets from the Upper Tester.

- Reference

[13] 5.4.5

- Initial Condition

- The Isochronous Broadcaster IUT broadcasts a single BIS using framed PDUs.
- The Lower Tester acts as a Synchronized Receiver and is synchronized to the IUT.
- All other BIS values as defined in [14] 4.11.1.

- Test Procedure

1. The Upper Tester sends SDU data to the IUT and includes Time_Stamps in the appropriate HCI ISO Data packets. The SDU data consists of octets that count from 0x00 to 0xFF and roll over back to 0x00, then the count resumes. This count continues across all SDU data.
2. The IUT broadcasts framed PDUs to the Lower Tester.

- Expected Outcome

Pass verdict

The Lower Tester receives PDUs with data as described in Step 1. Specifically, the contents of the HCI ISO Data packet Time_Stamp do not corrupt the contents of the data received by the Lower Tester.

4.15.2.2 Broadcast Isochronous Stream, Time_Stamp, Synchronized Receiver

- Test Purpose

Verify that a Synchronized Receiver IUT sets the TS_Flag bit if the ISO_Data_Load field provides a Time_Stamp to the Upper Tester over the HCI, and the bit is only set if the PB_Flag field equals 0b00 or 0b10.

Verify that a Synchronized Receiver IUT provides a Time_Stamp to the Upper Tester over the HCI when time stamps are mandatory.

- Reference

[13] 5.4.5

- Initial Condition

- The Synchronized Receiver IUT is synchronized to a single BIS using framed PDUs broadcast by the Lower Tester acting in the Isochronous Broadcaster role.
- All other BIS values as defined in [14] 4.11.1.

- Test Case Configuration

Test Case	Time_Stamp
HCI/BIS/BV-06-C	Optional
HCI/BIS/BV-07-C	Mandatory

Table 4.110: Broadcast Isochronous Stream, Time_Stamp, Synchronized Receiver test cases

- Test Procedure

- The Lower Tester sends framed PDUs containing isochronous data to the IUT.
- The IUT sends the received data to the Upper Tester in HCI ISO Data packets.

- Expected Outcome

Pass verdict

When the IUT sends HCI ISO Data packets with the PB_Flag set to 0b00 or 0b10, then:

- The Packet_Sequence_Number, ISO_SDU_Length, and Packet_Status_Flag fields are present.
- If Time_Stamps are mandatory, then the TS flag is set. Otherwise, the TS flag can be set or clear.
- If the TS_Flag is set, then a valid Time_Stamp field is present. Otherwise, Time_Stamp is not present.

When the IUT sends HCI ISO Data packets with the PB_Flag set to 0b01 or 0b11, then the TS flag is clear and the Time_Stamp, Packet_Sequence_Number, ISO_SDU_Length, and Packet_Status_Flag fields are not present.

When Time_Stamps are provided, the difference between Time_Stamps of adjacent SDUs is the SDU Interval within $\pm(\text{SCA_Broadcaster} + \text{SCA_Scanner}) * \text{ISO_Interval} \pm \text{Jitter}$. If SCA_Scanner is not known, assume that it may be up to 500 ppm.

[HCI/BIS/BI-06-C \[Broadcast Isochronous Stream Using Non-Test Command, Invalid BIG Parameters\]](#)

- Test Purpose

Verify that the IUT properly rejects the HCI_LE_Create_BIG command with invalid parameters.

- Reference

[\[13\]](#) 7.8.103

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser.

- Test Procedure

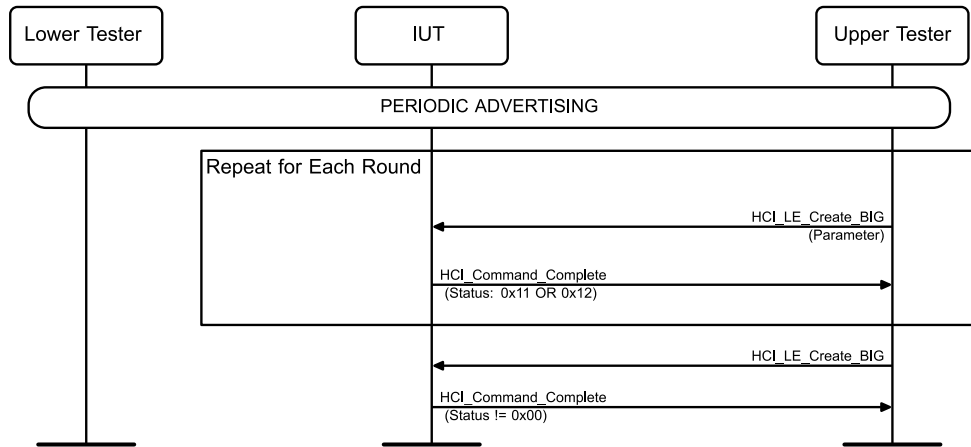


Figure 4.170: HCI/BIS/BI-06-C [Broadcast Isochronous Stream Using Non-Test Command, Invalid BIG Parameters] MSC

1. The Upper Tester sends an HCI_LE_Create_BIG command using the parameter value specified in Table 4.111 for the round. All other parameters are set to valid, supported values.
2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) in round 8 and Invalid HCI Command Parameters (0x12) in all other rounds.
3. Repeat Steps 1 and 2 for each round in Table 4.111.
4. The Upper Tester sends an HCI_LE_Create_BIG command using all of the values specified in Table 4.112.
5. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.

Round	LE_Create_BIG Parameter	Value
1	BIG_Handle	0xF0
2	Advertising_Handle	0xF0
3	Num_BIS	0x20
4	SDU_Interval	0x100000
5	Max_SDU	0x1000
6	Max_Transport_Latency	0x0FA1
7	RTN	0x20
8	PHY	0x09
9	Packing	0xF0
10	Framing	0xF0
11	Encryption	0xF0

Table 4.111: Parameter values for each case variation

LE_Create_BIG Parameter	Value
BIG_Handle	0xF0
Advertising_Handle	0xF0
Num_BIS	0x20
SDU_Interval	0x10000
Max_SDU	0x1000
Max_Transport_Latency	0x0FA1
RTN	0x20
PHY	0x09
Packing	0xF0
Framing	0xF0
Encryption	0xF0

Table 4.112: Parameter values for LE_Create_BIG command

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) in round 8, Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12) in round 12, and Invalid HCI Command Parameters (0x12) in all other rounds.

In Step 5, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to a valid error code.

HCI/BIS/BI-07-C [Broadcast Isochronous Stream Using Non-Test Command, Invalid Transport Latency]

- Test Purpose

Verify that a Central IUT rejects the creation of a BIS with an invalid max transport latency value.

- Reference

[13] 7.8.103

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser.

- Test Procedure

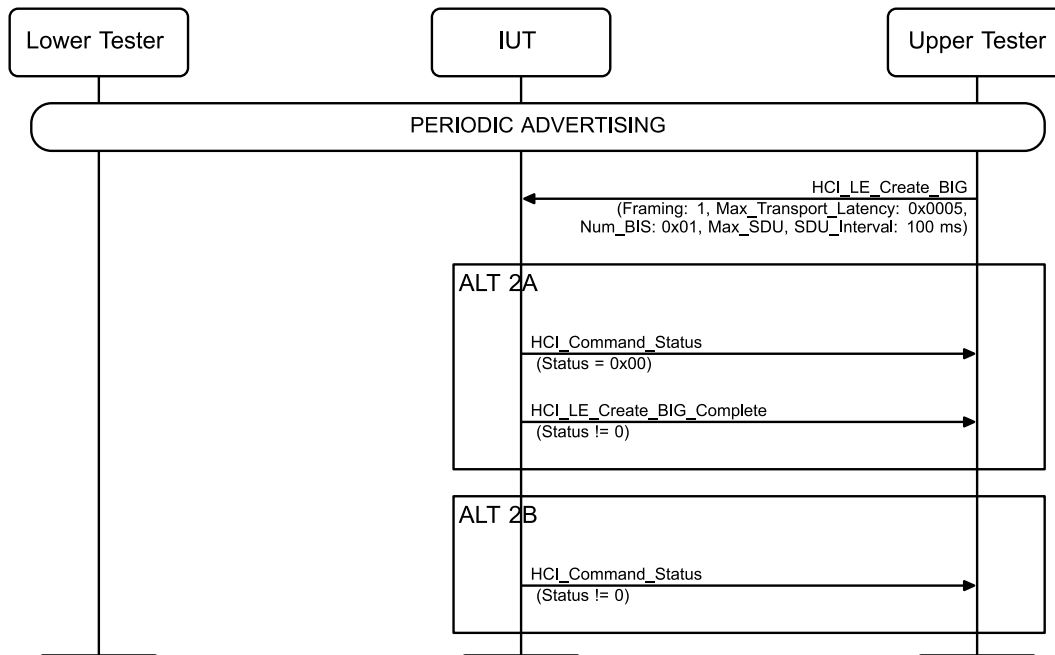


Figure 4.171: HCI/BIS/BI-07-C [Broadcast Isochronous Stream Using Non-Test Command, Invalid Transport Latency] MSC

- The Upper Tester sends an HCI_LE_Create_BIG command with Framing set to 1, Max_Transport_Latency set to 0x0005, Num_BIS set to 0x01, Max_SDU set to 753, SDU_Interval set to 100 ms, and all others parameters set to the values in [14] Section 4.11.1, Common Parameters.

- Perform alternative 2A or 2B depending on the IUT response.

Alternative 2A (Successful HCI_Command_Status event):

- 2A.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
- 2A.2 The IUT sends an HCI_LE_Create_BIG_Complete event to the Upper Tester with Status set to a valid error code, which can be Unsupported Feature or Parameter Value (0x11).

Alternative 2B (HCI_Command_Status with an error code):

- 2B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester with Status set to a valid error code, which can be Unsupported Feature or Parameter Value (0x11).

- Expected Outcome

Pass verdict

The IUT sends an HCI_LE_Create_BIG_Complete event to the Upper Tester with Status set to a valid error code, which can be Unsupported Feature or Parameter Value (0x11).

HCI/BIS/BV-08-C [Number of Completed Packets Event after Sending data in a Broadcaster]

- Test Purpose

Verify that the IUT properly sends the HCI Number of Completed Packets event after the IUT broadcasts Isochronous data.

- Reference

[13] 7.7.19

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser.
- The maximum number of BISes in a BIG is defined in the TSPX_max_tx_bises IXIT value.
- A BIG with TSPX_max_tx_bises BISes has been established with the IUT as Isochronous Broadcaster, Max_SDU set to 4, BN set to 1, and IRC set to GC. The remaining values are the defaults specified in [14] Section 4.11.1 Common Parameters for BIS but may be adjusted if necessary to establish the BIG.
- The input data path (Host to Controller) for each BIS is set up to receive data over HCI.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Read_Buffer_Size [v2] command to the IUT.
2. The IUT sends a successful HCI_Command_Complete event with an ISO_Data_Packet_Length and Total_Num_ISO_Data_Packets.
3. Let $n = \text{Total_Num_ISO_Data_Packets}$ from Step 2.
4. Throughout the remaining steps:
 - a) The IUT broadcasts either empty BIS PDUs or the data from the HCI ISO Data packets in Step 8.
 - b) Whenever the IUT sends an HCI_Number_Of_Completed_Packets event to the Upper Tester, increase n by the sum of the Num_Completed_Packets[i] values in the event for those values of i where Connection_Handle[i] refers to a BIS. Ignore those values of i where Connection_Handle[i] does not refer to a BIS.
5. Perform Steps 6–10 a total of 10 times.
6. Perform Steps 7–9 for each BIS with the BISes in a random order (different each time).
7. If n is zero, wait until n is non-zero.
8. The Upper Tester sends an HCI ISO Data packet to the IUT containing an SDU of length 4 octets and the correct connection handle for the BIS.
9. Decrement n by 1.
10. Wait for 10 seconds.

- Expected Outcome

Pass verdict

For each BIS, the sum of the Num_Completed_Packets[i] where Connection_Handle[i] refers to that BIS equals 10.

$n = \text{Total_Num_ISO_Data_Packets}$ from Step 2.

Fail verdict

After Step 10 completes, n does not equal Total_Num_ISO_Data_Packets from Step 2.



HCI/BIS/BI-10-C [LE Create BIG, Framed, Unsegmented Mode Unsupported]

- Test Purpose

Verify that the IUT that does not support Framed, Unsegmented mode returns an error in response to the HCI_LE_Create_BIG command.

- Reference

[19] 7.8.103

- Test Procedure

1. The Upper Tester sends an HCI_LE_Create_BIG command to the IUT with Framing set to 0x02.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x11.

- Expected Outcome

Pass verdict

In Step 2, the IUT returns an Unsupported Feature or Parameter Value error.

HCI/BIS/BI-11-C [Broadcast Isochronous Stream Using Non-Test Command, Invalid BIG Parameters]

- Test Purpose

Verify that the IUT properly rejects the LE Create BIG Command (the non-test variant) with invalid parameters.

- Reference

[13] 7.8.103

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser.

- Test Procedure

1. The Upper Tester sends an HCI_LE_Create_BIG command using the parameter values specified in [Table 4.113](#). All other parameters are set to valid, supported values.
2. The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x11 or 0x12.

LE_Create_BIG Parameter	Value
Framing	0x01
SDU_Interval	0x4E20
Max_Transport_Latency	0x0A

Table 4.113: Parameter values

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Status event to the Upper Tester with Status set to Unsupported Feature or Parameter Value (0x11) or Invalid HCI Command Parameters (0x12) in round 12.

HCI/BIS/BI-12-C [Broadcast Isochronous Stream, Broadcaster, HCI Read/Write Authenticated Payload Timeout error]

- Test Purpose

Verify that the IUT rejects an HCI Read or Write Authenticated Payload Timeout command applied to a BIS.

- Initial Condition

- The IUT is the Broadcaster role.
- BIS is established per the following configuration and broadcast by the IUT:

Variable	Value(s)
num_bis	1
sdu_int	100 ms
iso_int	100 ms
nse	3
mx_sdu	8
mx_pdu	8
phy	LE 1M PHY
packing	any supported
framing	any
bn	1
irc	3
pto	0
Encryption	1
broadcast_code	any supported

Table 4.114: BIS Configuration

- Test Procedure

1. The Upper Tester sends the HCI_Read_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the BIS.
2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.
3. The Upper Tester sends the HCI_Write_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the BIS.
4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.

- Expected Outcome

Pass verdict

In Steps 2 and 4, the IUT sends an 0x0C error to the Upper Tester.

HCI/BIS/BI-14-C [Broadcast Isochronous Stream, Synchronized Receiver, HCI Read/Write Authenticated Payload Timeout error]

- **Test Purpose**
Verify that the IUT rejects an HCI Read or Write Authenticated Payload Timeout command applied to a BIS.
- **Initial Condition**
 - The Lower Tester broadcasts a BIS in a BIG, and the IUT has synchronized to it.
- **Test Procedure**
 1. The Upper Tester sends the HCI_Read_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the BIS.
 2. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.
 3. The Upper Tester sends the HCI_Write_Authenticated_Payload_Timeout command to the IUT with Connection_Handle set to the handle for the BIS.
 4. The IUT sends an HCI_Command_Complete event to the Upper Tester with Status set to 0x0C.
- **Expected Outcome**
Pass verdict
In Steps 2 and 4, the IUT sends an 0x0C error to the Upper Tester.

4.15.2.3 Reject creating a BIG when the IUT does not support a BIG created from a Periodic Advertising with Responses

- **Test Purpose**
Verify that an Isochronous Broadcaster IUT fails the command to create a BIG when advertising using Periodic Advertising with Responses.
- **Reference**
[\[12\]](#) 7.8.103, 7.8.104
- **Initial Condition**
 - The Isochronous Broadcaster IUT is advertising periodic advertising with responses using selected parameters compatible with the default BIG values as defined in [\[15\]](#) Section 4.11.1, Common Parameters.
- **Test Case Configuration**

Test Case	HCI Command
HCI/BIS/BV-09-C [Reject creating a BIG when the IUT does not support a BIG created from a Periodic Advertising with Responses, LE Create BIG]	HCI_LE_Create_BIG
HCI/BIS/BV-10-C [Reject creating a BIG when the IUT does not support a BIG created from a Periodic Advertising with Responses, LE Create BIG Test]	HCI_LE_Create_BIG_Test

Table 4.115: Reject creating a BIG when the IUT does not support a BIG created from a Periodic Advertising with Responses test cases

- Test Procedure

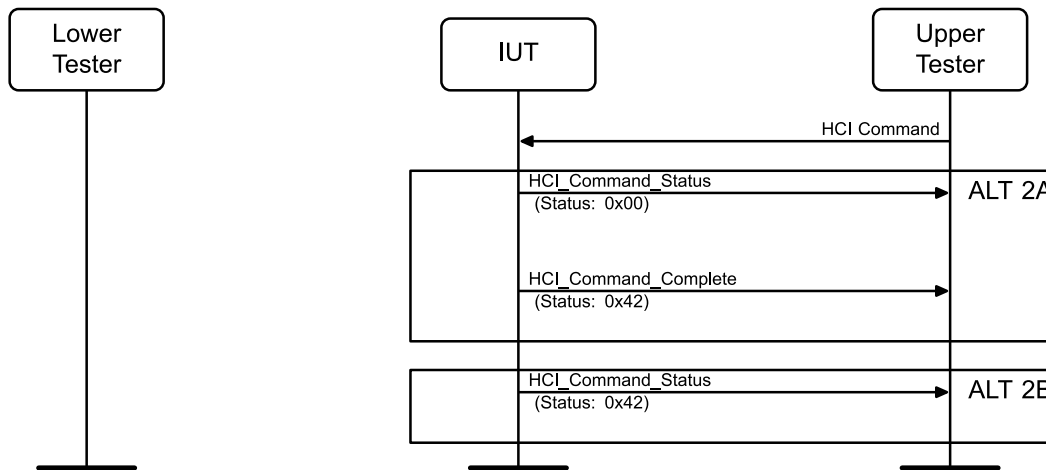


Figure 4.172: Reject creating a BIG when the IUT does not support a BIG created from a Periodic Advertising with Responses MSC

- The Upper Tester sends the HCI Command specified by [Table 4.115](#) to the IUT.
- Perform either alternative 2A or 2B depending on the IUT response.
 - Alternative 2A (Successful HCI_Command_Status):
 - The IUT sends a successful HCI_Command_Status to the Upper Tester.
 - The IUT sends an HCI_LE_Create_BIG_Complete event to the Upper Tester with Status set to 0x42 (Unknown Advertising Identifier).
 - Alternative 2B (HCI_Command_Status with an error code):
 - The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x42 (Unknown Advertising Identifier).

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an error to the Upper Tester.

HCI/BIS/BV-11-C [Broadcast Isochronous Stream testing overlength data on the LE Coded PHY]

- Test Purpose

Verify that the IUT correctly handles Periodic Advertising data plus a BIGInfo that will not fit within the periodic advertising interval.

- Reference

[\[12\]](#) 7.8.103

- Initial Condition

- State: Periodic Advertising, the IUT is advertiser, PHY is the LE Coded PHY, the periodic advertising interval is 7.5 ms, periodic advertising data is 93 random octets, and periodic advertising is enabled.

- Test Procedure
 1. The Upper Tester sends an HCI_LE_Create_BIG command using the Advertising_Handle of the periodic advertising in the initial condition, PHY=0x04, and Encryption = 0x00.
 2. The IUT returns an HCI_Command_Status or sends a successful HCI_Command_Status followed by an HCI_LE_Create_BIG_Complete event with the error code Packet Too Long (0x45) set on one of them to the Upper Tester.
 3. The Upper Tester commands the IUT to stop the periodic advertising.
 4. Repeat Steps 1 and 2.
- Expected Outcome

Pass verdict

In Step 2, the IUT returns the error code Packet Too Long (0x45).

4.16 SCO and eSCO Connections

Verify that the IUT correctly rejects an attempt to create a SCO connection when retransmission mandates an eSCO connection.

4.16.1 SCO and eSCO default settings

These default settings will be used for the different SCO and eSCO test cases.

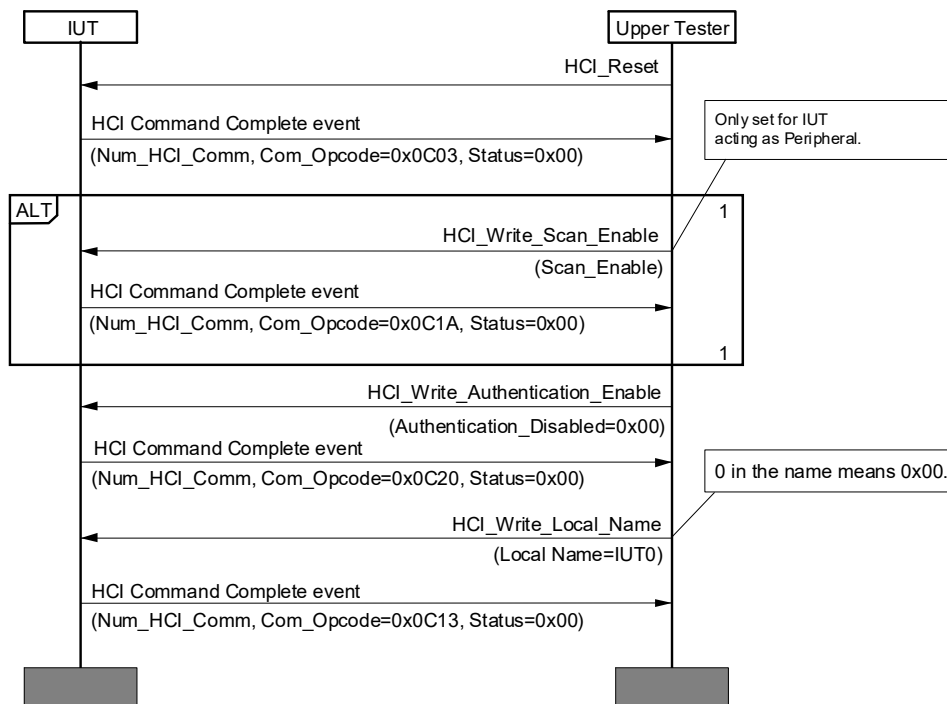


Figure 4.173: Default settings used for SCO and eSCO test cases MSC

All events are enabled in the Event_mask field in HCI_Set_Event_Mask with the exception of bit 30 Page Scan Mode Change event, which is deprecated. Bit 61, which is the LE Meta event, is considered “don’t care”, and may or may not be set.

4.16.2 Do Not Establish a SCO Connection When Retransmission is Specified

- Test Purpose

Verify that the IUT acting as either Central or Peripheral does not establish a SCO connection when retransmission is specified.

- Initial Condition

- See Section 4.16.1 SCO and eSCO default settings.
- An LMP features request has been executed.
- An ACL connection is established between the IUT and the Lower Tester.
- Valid parameters for the HCI_Setup_Synchronous_Connection command are defined by the TSPX_hci_setup_synchronous_connection_params IXIT value.
- Valid parameters for the HCI_Enhanced_Setup_Synchronous_Connection command are defined by the TSPX_hci_enhanced_setup_connection_params IXIT value.

- Test Case Configuration

Test Case	Role	HCI Command
HCI/SCO/BV-01-C [11] 7.1.26	Central	HCI_Setup_Synchronous_Connection
HCI/SCO/BV-02-C [11] 7.1.26	Peripheral	HCI_Setup_Synchronous_Connection
HCI/SCO/BV-03-C [11] 7.1.45	Central	HCI_Enhanced_Setup_Synchronous_Connection
HCI/SCO/BV-04-C [11] 7.1.45	Peripheral	HCI_Enhanced_Setup_Synchronous_Connection

Table 4.116: Do Not Establish a SCO Connection When Retransmission is Specified test cases

- Test Procedure

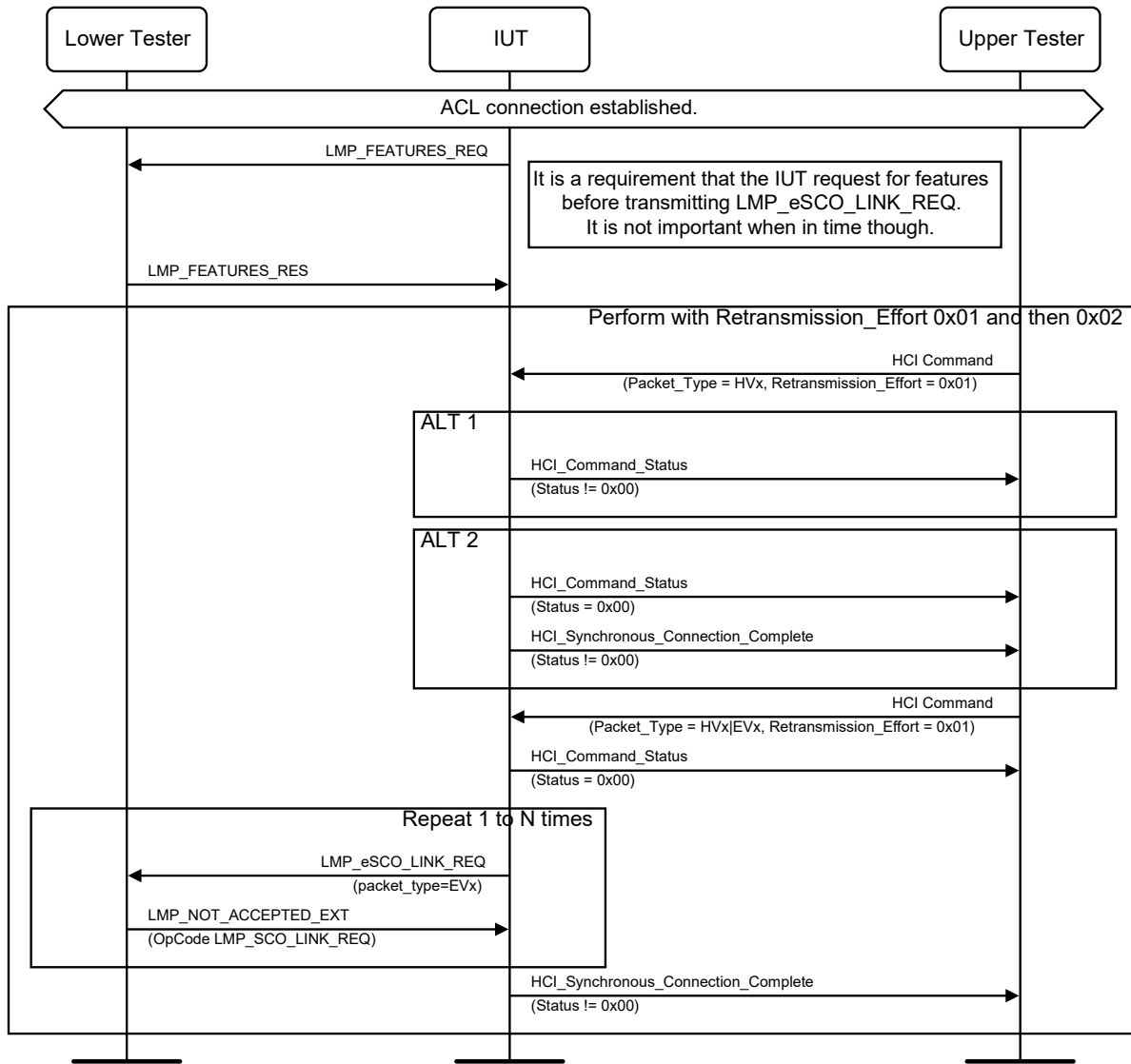


Figure 4.174: Do Not Establish a SCO Connection When Retransmission is Specified MSC

1. The Upper Tester sends an HCI Command as specified in [Table 4.116](#) to the IUT with the supported SCO packet bits set in Packet_Type, no eSCO “may be used” bits set, all eSCO “shall not be used” bits set, the Retransmission_Effort set to 0x01, and all other parameters as specified in the IXIT.
2. The Upper Tester receives an HCI_Command_Status event from the IUT indicating that the command failed or receives a successful HCI_Command_Status event followed by an HCI_Synchronous_Connection_Complete event with an error.
3. If the Lower Tester receives either an LMP_SCO_LINK_REQ or LMP_eSCO_LINK_REQ PDU, the test fails.
4. The Upper Tester sends the same command with the same parameters as in Step 1, except that Packet_Type is set to allow all SCO and eSCO packet types supported by the IUT.
5. The Upper Tester receives an HCI_Command_Status event from the IUT indicating success.
6. Perform Steps 7 and 8 between 1 to N times where N is the number of different eSCO packet types supported by the IUT as specified in the HCI Command in Step 4. In Step 7, a different eSCO packet type must be used each time.

7. The Lower Tester receives an LMP_eSCO_LINK_REQ PDU from the IUT. If the IUT sends an LMP_SCO_LINK_REQ PDU to the Lower Tester, the test fails.
8. The Lower Tester refuses the eSCO connection by sending an LMP_NOT_ACCEPTED_EXT PDU to the IUT.
9. The Upper Tester receives an HCI_Synchronous_Connection_Complete event indicating failure.
10. Repeat Steps 1–9 but using a Retransmission_Effort of 0x02.

- Expected Outcome

Pass verdict

In Step 2, the IUT sends an HCI_Command_Status event indicating that the HCI command specified in [Table 4.116](#) failed, or the IUT sends a successful HCI_Command_Status event followed by an HCI_Synchronous_Connection_Complete event with an error.

In Step 5, the IUT sends an HCI_Command_Status event indicating success.

In Step 7, the IUT sends an LMP_eSCO_LINK_REQ PDU.

In Step 9, the IUT sends an HCI_Synchronous_Connection_Complete event indicating failure.

Fail verdict

In Step 3, the IUT sends an LMP_SCO_LINK_REQ or LMP_eSCO_LINK_REQ PDU.

In Step 7, the IUT sends an LMP_SCO_LINK_REQ.

4.16.3 Accept Synchronous Connection Request, Ignore Transmit_Bandwidth, Receive_Bandwidth, and Retransmission_Effort, SCO

- Test Purpose

Verify that the IUT acting as either Central or Peripheral ignores the Transmit_Bandwidth, Receive_Bandwidth, and Retransmission_Effort parameters for an SCO connection.

- Initial Condition

- See Section [4.16.1 SCO and eSCO default settings](#).
- An LMP features request has been executed.
- An ACL connection is established between the IUT and the Lower Tester.
- Valid parameters for the HCI_Accept_Synchronous_Connection_Request command are defined by the TSPX_hci_accept_synchronous_connection_request_params IXIT value.

- Test Case Configuration

Test Case	Role	HCI Command
HCI/SCO/BV-09-C [11] 7.1.27	Central	HCI_Accept_Synchronous_Connection_Request
HCI/SCO/BV-10-C [11] 7.1.27	Peripheral	HCI_Accept_Synchronous_Connection_Request
HCI/SCO/BV-11-C [11] 7.1.46	Central	HCI_Enhanced_Accept_Synchronous_Connection_Request
HCI/SCO/BV-12-C [11] 7.1.46	Peripheral	HCI_Enhanced_Accept_Synchronous_Connection_Request

Table 4.117: Accept Synchronous Connection Request, Ignore Transmit_Bandwidth, Receive_Bandwidth, and Retransmission_Effort, SCO test cases

- Test Procedure

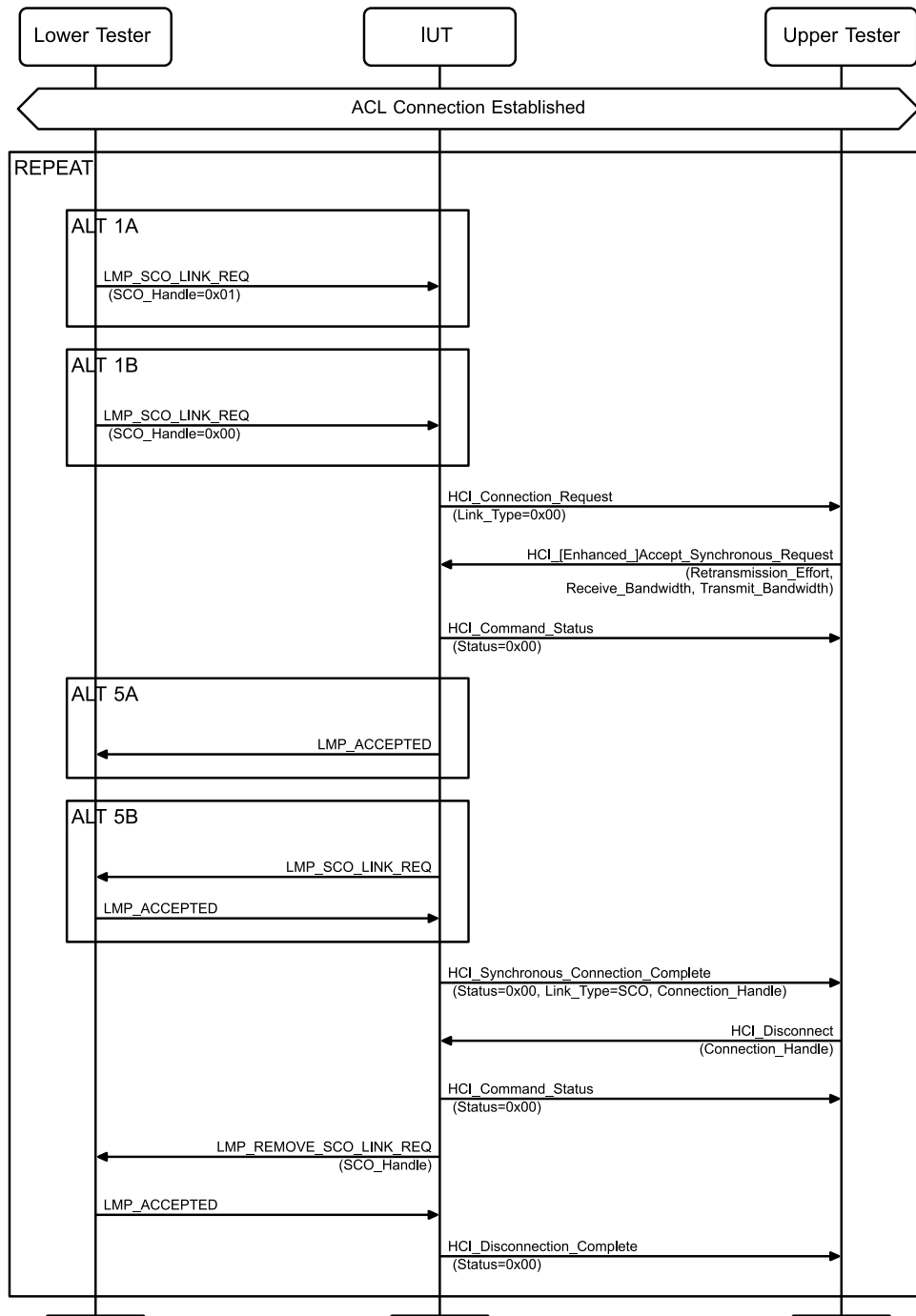


Figure 4.175: Accept Synchronous Connection Request, Ignore Transmit_Bandwidth, Receive_Bandwidth, and Retransmission_Effort, SCO MSC

Repeat Steps 1–10 for each round in [Table 4.118](#).

1. Perform either alternative 1A or 1B depending on the IUT role.

Alternative 1A (The IUT is Peripheral):

- 1A.1 The Lower Tester sends an LMP_SCO_LINK_REQ PDU to the IUT with SCO_Handle set to 0x01.

Alternative 1B (The IUT is Central):

- 1B.1 The Lower Tester sends an LMP_SCO_LINK_REQ PDU to the IUT with SCO_Handle set to 0x00.
2. The IUT sends an HCI_Connection_Request event with Link_Type set to 0x00 to the IUT.
3. The Upper Tester sends an HCI command as specified in Table 4.117 to the IUT with Transmit_Bandwidth, Retransmission_Effort, and Receive_Bandwidth set as specified in Table 4.118 and all other parameters as specified in the IXIT.
4. The IUT sends a successful HCI_Command_Status event to the Upper Tester.
5. Perform either alternative 5A or 5B depending on the IUT role.

Alternative 5A (The IUT is Peripheral):

- 5A.1 The IUT sends an LMP_ACCEPTED PDU to the Lower Tester.

Alternative 5B (The IUT is Central):

- 5B.1 The IUT sends an LMP_SCO_LINK_REQ PDU to the Lower Tester.
- 5B.2 The Lower Tester sends an LMP_ACCEPTED PDU to the IUT.
6. The IUT sends an HCI_Synchronous_Connection_Complete command to the Upper Tester with Status set to 0x00, Link_Type set to SCO, and a Connection_Handle.
7. The Upper Tester sends an HCI_Disconnect command to the IUT with Connection_Handle set to the value in Step 6 and receives a successful HCI_Command_Status in response.
8. The IUT sends an LMP_REMOVE_SCO_LINK_REQ to the Lower Tester with an SCO_Handle.
9. The Lower Tester sends an LMP_ACCEPTED PDU to the IUT.
10. The IUT sends a successful HCI_Disconnection_Complete event to the Upper Tester.

Round	Retransmission_Effort	Receive_Bandwidth	Transmit_Bandwidth
1	0x01	0x00000001	0x00000001
2	0x02	0xFFFFFFFFFE	0xFFFFFFFFFE
3	0xFF	0xFFFFFFFFF	0xFFFFFFFFF

Table 4.118: Accept Synchronous Connection Request, Ignore Transmit_Bandwidth, Receive_Bandwidth, and Retransmission_Effort, SCO rounds

- Expected Outcome

Pass verdict

In Step 5A.1, the IUT sends an LMP_ACCEPTED PDU with the OpCode set to LMP_SCO_LINK_REQ.

In Step 5B.1, the IUT sends an LMP_SCO_LINK_REQ PDU to the Lower Tester.

4.16.4 SCO Connection creation fails when AES-CCM encryption is enabled

- Test Purpose

Verify that if AES-CCM encryption has been enabled on an ACL connection, SCO connection creation requests (using the HCI Enhanced Setup Synchronous Connection command) from the Upper Tester will be rejected by the IUT with Error_Code 0x0E: Rejected Due to Security Reasons.

- Reference

[1] 4.6.1

- Initial Condition

- The IUT is in the role specified in Table 4.119.
- An AES-CCM encrypted point-to-point connection has been established between the IUT and the Lower Tester.



- Test Case Configuration

Test Case	Role	HCI Command
HCI/SCO/BV-13-C [SCO Connection creation fails when AES-CCM encryption is enabled – Setup Synchronous Connection]	Central	HCI_Setup_Synchronous_Connection
HCI/SCO/BV-14-C [SCO Connection creation fails when AES-CCM encryption is enabled – Setup Synchronous Connection]	Peripheral	HCI_Setup_Synchronous_Connection
HCI/SCO/BV-15-C [SCO Connection creation fails when AES-CCM encryption is enabled – Enhanced Setup Synchronous Connection]	Central	HCI_Enhanced_Setup_Synchronous_Connection
HCI/SCO/BV-16-C [SCO Connection creation fails when AES-CCM encryption is enabled – Enhanced Setup Synchronous Connection]	Peripheral	HCI_Enhanced_Setup_Synchronous_Connection

Table 4.119: SCO Connection creation fails when AES-CCM encryption is enabled test cases

- Test Procedure

- The Upper Tester sends the HCI command specified in Table 4.119 to the IUT with Packet_Type set to 0x07 (HV1, HV2, HV3).
- Perform either alternative 2A or 2B depending on the IUT's response.
 - Alternative 2A (HCI_Command_Status = 0x0E):
 - 2A.1 The IUT sends an HCI_Command_Status event to the Upper Tester with Status set to 0x0E.
 - Alternative 2B (Successful HCI_Command_Status):
 - 2B.1 The IUT sends a successful HCI_Command_Status event to the Upper Tester.
 - 2B.2 The IUT sends an HCI_Synchronous_Connection_Complete event to the Upper Tester with Status set to 0x0E.

- Expected Outcome

Pass verdict

The IUT responds to the HCI_Enhanced_Setup_Synchronous_Connection command with either an HCI_Command_Status event or an HCI_Synchronous_Connection_Complete event with Error_Code 0x0E: Rejected Due to Security Reasons.

- Notes

If the IUT sends an LMP_SCO_LINK_REQ to the Lower Tester, the Lower Tester should accept the request.

4.17 Event Versioning

4.17.1 Check correct handling of HCI Encryption Change event, BR/EDR

- Test Purpose

Tests that the IUT returns the correct HCI Encryption Change event on BR/EDR depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[17] 7.7.8

- Initial Condition

- The IUT is in the Peripheral role.
- The min supported encryption key size is specified by the TSPX_min_supported_encryption_key_size IXIT value.

- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-01-C	A
HCI/EVV/BV-02-C	B

Table 4.120: Check correct handling of HCI Encryption Change event, BR/EDR test cases

- Test Procedure

- The Upper Tester sends an HCI_Set_Event_Mask command that enables both [v1] and [v2] versions of the HCI_Encryption_Change event.
- The Upper Tester sends an HCI_Set_Connection_Encryption command to the IUT with Encryption_Enable set to 0x01 and receives a successful HCI_Command_Complete in response.
- The Lower Tester rejects every received LMP PDU.
- Perform either alternative 4A or 4B depending on the alternative specified in [Table 4.120](#).
Alternative 4A (alternative A is specified):
4A.1 The IUT sends the HCI_Encryption_Change [v1] event to the Upper Tester.
Alternative 4B (alternative B is specified):
4B.1 The IUT sends the HCI_Encryption_Change [v2] event to the Upper Tester.
- The Upper Tester sends an HCI_Set_Event_Mask command that enables the [v2] version of the HCI_Encryption_Change event but masks out the [v1] version.
- The Upper Tester sends an HCI_Set_Connection_Encryption command to the IUT with Encryption_Enable set to 0x01 and receives a successful HCI_Command_Complete in response.
- The Lower Tester rejects every received LMP PDU.
- Perform either alternative 8A or 8B depending on the alternative specified in [Table 4.120](#).
Alternative 8A (alternative A is specified):
8A.1 The IUT does not send an HCI_Encryption_Change event.
Alternative 8B (alternative B is specified):
8B.1 The IUT sends the HCI_Encryption_Change [v2] event to the Upper Tester.
- The Upper Tester sends an HCI_Set_Event_Mask command that enables the HCI_Encryption_Change [v1] of the event but masks out the [v2] version.
- The Upper Tester sends an HCI_Set_Connection_Encryption command to the IUT with Encryption_Enable set to 0x01 and receives a successful HCI_Command_Complete in response.
- The Lower Tester rejects every received LMP PDU.
- The IUT sends the HCI_Encryption_Change [v1] event to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT sends the [v1] versions of the events in Steps 4A.1 and 12.

The IUT sends the [v2] versions of the events in Steps 4B.1 and 8B.1.

The IUT does not send an event in Step 8A.1.

4.17.2 Check correct handling of HCI Encryption Change event with two versions, LE

- Test Purpose

Tests that the IUT returns the correct HCI Encryption Change event on LE depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[17] 7.7.8

- Initial Condition

- The IUT is in the role specified in Table 4.121.

- Test Case Configuration

Test Case ID	Role	LL Test	Alternative
HCI/EVV/BV-03-C	Peripheral	LL/SEC/PER/BV-01-C	A
HCI/EVV/BV-04-C	Peripheral	LL/SEC/PER/BV-01-C	B
HCI/EVV/BV-05-C	Central	LL/SEC/CEN/BV-01-C	A
HCI/EVV/BV-06-C	Central	LL/SEC/CEN/BV-01-C	B

Table 4.121: Check correct handling of HCI Encryption Change event with two versions, LE test cases

- Test Procedure

- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables both [v1] and [v2] versions of the HCI event specified in Table 4.121.
- Perform the LL test specified in Table 4.121 up to the HCI_Encryption_Change event.
- Perform either alternative 3A or 3B depending on the alternative specified in Table 4.121.
Alternative 3A (alternative A is specified):
3A.1 The IUT sends the HCI_Encryption_Change [v1] event to the Upper Tester.
Alternative 3B (alternative B is specified):
3B.1 The IUT sends the HCI_Encryption_Change [v2] event to the Upper Tester.
- The Lower Tester terminates the connection and then creates a new one in the same role.
- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the [v2] version of the HCI_Encryption_Change event but masks out the [v1] version.
- Perform the LL test specified in Table 4.121 up to the HCI_Encryption_Change event.
- Perform either alternative 7A or 7B depending on the alternative specified in Table 4.121.
Alternative 7A (alternative A is specified):
7A.1 The IUT does not send an HCI_Encryption_Change event.
Alternative 7B (alternative B is specified):
7B.1 The IUT sends the HCI_Encryption_Change [v2] event to the Upper Tester.
- The Lower Tester terminates the connection and then creates a new one in the same role.

9. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_Encryption_Change [v1] event but masks out the [v2] version.
10. Perform the LL test specified in [Table 4.121](#) up to the HCI_Encryption_Change [v1] event.
11. The IUT sends the HCI_Encryption_Change [v1] event to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT sends the HCI_Encryption_Change [v1] event in Steps 3A.1 and 11.

The IUT sends the HCI_Encryption_Change [v2] event in Steps 3B.1 and 7B.1.

The IUT does not send an HCI_Encryption_Change event in Step 7A.1.

4.17.3 Check correct handling of LE Periodic Advertising Sync Established event with two versions

- Test Purpose

Tests that the IUT returns the correct HCI_LE_Periodic_Advertising_Sync_Established event depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[\[17\]](#) 7.7.65.14

- Initial Condition

- The IUT is scanning.

- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-07-C	A
HCI/EVV/BV-08-C	B

Table 4.122: Check correct handling of LE Periodic Advertising Sync Established event with two versions test cases

- Test Procedure

1. The Lower Tester begins advertising using ADV_EXT_IND and AUX_ADV_IND PDUs. The ADV_EXT_IND PDUs include an AuxPtr that refers to the AUX_ADV_IND PDU on the secondary advertising channel. The AUX_ADV_IND PDUs include the AdvA field containing the Lower Tester address and the SyncInfo field referring to a missing AUX_SYNC_IND PDU such that sync is not possible. The Lower Tester continues advertising until directed to stop in the test procedure.
2. The IUT sends an HCI_LE_Extended_Advertising_Report event to the Upper Tester containing a nonzero Periodic_Advertising_Interval, Data Status in the Event_Type[i] field set to the value 0b00 (Complete).
3. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables both [v1] and [v2] versions of the HCI_LE_Periodic_Advertising_Sync_Established event.
4. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT and receives a successful HCI_Command_Status event in response.
5. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.

6. Perform either alternative 6A or 6B depending on the alternative specified in [Table 4.122](#).
 - Alternative 6A (alternative A is specified):
 - 6A.1 The IUT sends the HCI_LE_Periodic_Advertising_Sync_Established [v1] event to the Upper Tester.
 - Alternative 6B (alternative B is specified):
 - 6B.1 The IUT sends the HCI_LE_Periodic_Advertising_Sync_Established [v2] event to the Upper Tester.
7. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the [v2] version of the HCI_LE_Periodic_Advertising_Sync_Established event but masks out the [v1] version.
8. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT and receives a successful HCI_Command_Status event in response.
9. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
10. Perform either alternative 10A or 10B depending on the alternative specified in [Table 4.122](#).
 - Alternative 10A (alternative A is specified):
 - 10A.1 The IUT does not send an HCI_LE_Periodic_Advertising_Sync_Established event.
 - Alternative 10B (alternative B is specified):
 - 10B.1 The IUT sends the HCI_LE_Periodic_Advertising_Sync_Established [v2] event to the Upper Tester.
11. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Periodic_Advertising_Sync_Established [v1] event but masks out the [v2] version.
12. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync command to the IUT and receives a successful HCI_Command_Status event in response.
13. The Upper Tester sends an HCI_LE_Periodic_Advertising_Create_Sync_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
14. The IUT sends the HCI_LE_Periodic_Advertising_Sync_Established [v1] event to the Upper Tester with error code 0x3E.

- Expected Outcome

Pass verdict

The IUT sends the [v1] versions of the events in Steps 6A.1 and 12.

The IUT sends the [v2] versions of the events in Steps 6B.1 and 10B.1.

The IUT does not send an event in Step 10A.1.

4.17.4 Check correct handling of LE Periodic Advertising Report event with two versions

- Test Purpose

Tests that the IUT returns the correct LE Periodic Advertising Report event depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[\[17\]](#) 7.7.65.15

- Initial Condition

- The IUT is scanning.
- The Lower Tester is configured to send periodic advertising events.
- The IUT is synchronized to the periodic advertising sent by the Lower Tester.



- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-09-C	A
HCI/EVV/BV-10-C	B

Table 4.123: Check correct handling of LE Periodic Advertising Report event with two versions test cases

- Test Procedure

- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables both [v1] and [v2] versions of the HCI_LE_Periodic_Advertising_Report event.
- Perform either alternative 2A or 2B depending on the alternative specified in [Table 4.123](#).
Alternative 2A (alternative A is specified):
2A.1 The IUT sends at least one HCI_LE_Periodic_Advertising_Report [v1] event to the Upper Tester.
Alternative 2B (alternative B is specified):
2B.1 The IUT sends at least one HCI_LE_Periodic_Advertising_Report [v2] event to the Upper Tester.
- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the [v2] version of the HCI_LE_Periodic_Advertising_Report event but masks out the [v1] version.
- Perform either alternative 4A or 4B depending on the alternative specified in [Table 4.123](#).
Alternative 4A (alternative A is specified):
4A.1 The IUT does not send any HCI_LE_Periodic_Advertising_Report events.
Alternative 4B (alternative B is specified):
4B.1 The IUT sends HCI_LE_Periodic_Advertising_Report [v2] events to the Upper Tester.
- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Periodic_Advertising_Report [v1] event but masks out the [v2] version.
- The IUT sends HCI_LE_Periodic_Advertising_Report [v1] events to the Upper Tester.

- Note

Steps 3 and 5 may take a little while for the new event mask to take effect, and therefore Steps 4 and 6 should run for at least 50 periodic connection events or, for Step 6, until a [v1] event is sent to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT sends the [v1] versions of the events in Steps 2A.1 and 6.

The IUT sends the [v2] versions of the events in Steps 2B.1 and 4B.1.

The IUT does not send an event in Step 4A.1.

4.17.5 Check correct handling of HCI LE Periodic Advertising Sync Transfer Received event with two versions

- Test Purpose

Tests that the IUT returns the correct HCI LE Periodic Advertising Sync Transfer Received event on LE depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[\[17\]](#) 7.7.65.24



- Initial Condition
 - An ACL connection has been established between the Central IUT and the Peripheral Lower Tester with a valid Connection Handle.
- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-11-C	A
HCI/EVV/BV-12-C	B

Table 4.124: Check correct handling of HCI LE Periodic Advertising Sync Transfer Received event with two versions test cases

- Test Procedure
 1. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables both [v1] and [v2] versions of the HCI_LE_Periodic_Advertising_Sync_Transfer event.
 2. The Upper Tester sends an HCI_LE_Set_Periodic_Advertising_Sync_Transfer_Parameters command to the IUT with Mode set to 0x02, Skip set to 0, and receives a successful HCI_Command_Complete event in response.
 3. The Lower Tester sends an LL_PERIODIC_SYNC_IND PDU to the IUT with ID set to any nonzero value, SyncInfo set to any values such that sync is not possible, and all other parameters set to valid values.
 4. Perform either alternative 4A or 4B depending on the alternative specified in [Table 4.124](#).

Alternative 4A (alternative A is specified):

 - 4A.1 The IUT sends an HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v1] event to the Upper Tester with status set to 0x3E (Connection Failed to be established).

Alternative 4B (alternative B is specified):

 - 4B.1 The IUT sends an HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v2] event to the Upper Tester with status set to 0x3E (Connection Failed to be established).
 5. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v2] event but masks out the [v1] version.
 6. The Lower Tester sends an LL_PERIODIC_SYNC_IND PDU to the IUT with ID set to any nonzero value, SyncInfo set to any values such that sync is not possible, and all other parameters set to valid values.
 7. Perform either alternative 7A or 7B depending on the alternative specified in [Table 4.124](#).

Alternative 7A (alternative A is specified):

 - 7A.1 The IUT does not send an HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v1] event.

Alternative 7B (alternative B is specified):

 - 7B.1 The IUT sends an HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v2] event to the Upper Tester with status set to 0x3E (Connection Failed to be established).
 8. The Upper Tester sends an HCI_LE_Periodic_Advertising_Terminate_Sync command to the IUT and receives a successful HCI_Command_Complete event in response.
 9. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v1] event but masks out the [v2] version.
 10. The Lower Tester sends an LL_PERIODIC_SYNC_IND PDU to the IUT with ID set to any nonzero value, SyncInfo set to any values such that sync is not possible, and all other parameters set to valid values.

11. The IUT sends an HCI_LE_Periodic_Advertising_Sync_Transfer_Received [v1] event to the Upper Tester with status set to 0x3E (Connection Failed to be established).

- Expected Outcome

Pass verdict

The IUT sends the [v1] versions of the events in Steps 4A.1 and 12.

The IUT sends the [v2] versions of the events in Steps 4B.1 and 7B.1.

The IUT does not send an event in Step 7A.1.

4.17.6 Check correct handling of LE Enhanced Connection Complete Event with two versions and legacy LE Connection Complete Event, Central

- Test Purpose

Tests that the central IUT returns the correct HCI_LE_Enhanced_Connection_Complete event depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[17] 7.7.65.1

- Initial Condition

- State: Standby

- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-13-C	A
HCI/EVV/BV-14-C	B
HCI/EVV/BV-15-C	C

Table 4.125: Check correct handling of LE Enhanced Connection Complete Event with two versions and legacy LE Connection Complete Event, Central test cases

- Test Procedure

1. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Connection_Complete event and enables both [v1] and [v2] versions of the HCI_LE_Enhanced_Connection_Complete event.
2. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT and receives a successful HCI_Command_Status event in response.
3. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
4. Perform either alternative 4A, 4B, or 4C depending on the alternative specified in [Table 4.125](#).
 - Alternative 4A (alternative A is specified):
 - 4A.1 The IUT sends the HCI_LE_Connection_Complete event to the Upper Tester with a valid error code.
 - Alternative 4B (alternative B is specified):
 - 4B.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester with a valid error code.
 - Alternative 4C (alternative C is specified):
 - 4C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v2] event to the Upper Tester with a valid error code.

5. The Upper Tester sends an HCI_LE_Set_Event_Mask command that disables the HCI_LE_Connection_Complete event and enables the [v2] version of the HCI_LE_Enhanced_Connection_Complete event but masks out the [v1] version.
6. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT and receives a successful HCI_Command_Status event in response.
7. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
8. Perform either alternative 8A, 8B, or 8C depending on the alternative specified in [Table 4.125](#).
 - Alternative 8A (alternative A is specified):
 - 8A.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.
 - Alternative 8B (alternative B is specified):
 - 8B.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.
 - Alternative 8C (alternative C is specified):
 - 8C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v2] event to the Upper Tester with a valid error code.
9. The Upper Tester sends an HCI_LE_Set_Event_Mask command that disables the HCI_LE_Connection_Complete event and enables the HCI_LE_Enhanced_Connection_Complete [v1] event but masks out the [v2] version.
10. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT and receives a successful HCI_Command_Status event in response.
11. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
12. Perform either alternative 12A, 12B, or 12C depending on the alternative specified in [Table 4.125](#).
 - Alternative 12A (alternative A is specified):
 - 12A.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.
 - Alternative 12B (alternative B is specified):
 - 12B.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester with a valid error code.
 - Alternative 12C (alternative C is specified):
 - 12C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester with a valid error code.
13. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Connection_Complete event and masks out both the [v1] and [v2] versions of the HCI_LE_Enhanced_Connection_Complete event.
14. The Upper Tester sends an HCI_LE_Create_Connection command to the IUT and receives a successful HCI_Command_Status event in response.
15. The Upper Tester sends an HCI_LE_Create_Connection_Cancel command to the IUT and receives a successful HCI_Command_Complete event in response.
16. The IUT sends the HCI_LE_Connection_Complete event to the Upper Tester with a valid error code.

- Expected Outcome

Pass verdict

The IUT sends the HCI_LE_Connection_Complete event in Steps 4A.1 and 16.

The IUT sends the [v1] versions of the events in Steps 4B.1, 12B.1, and 12C.1.

The IUT sends the [v2] versions of the events in Steps 4C.1 and 8C.1.

The IUT does not send an event in Steps 8A.1, 8B.1, and 12A.1.

4.17.7 Check correct handling of LE Enhanced Connection Complete Event with two versions and legacy LE Connection Complete Event, Peripheral

- Test Purpose

Tests that the peripheral IUT returns the correct HCI_LE_Enhanced_Connection_Complete event depending on which of the v1 and v2 versions are set in the event mask.

- Reference

[17] 7.7.65.1

- Initial Condition

- State: Standby

- Test Case Configuration

Test Case ID	Alternative
HCI/EVV/BV-16-C	A
HCI/EVV/BV-17-C	B
HCI/EVV/BV-18-C	C

Table 4.126: Check correct handling of LE Enhanced Connection Complete Event with two versions and legacy LE Connection Complete Event, Peripheral test cases

- Test Procedure

- The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Connection_Complete event and enables both [v1] and [v2] versions of the HCI_LE_Enhanced_Connection_Complete event.
- The Upper Tester sends the HCI_LE_Set_Advertising_Parameters command to the IUT with Advertising_Type set to 0x00 (ADV_IND), Advertising_Filter_Policy set to 0x00, and other parameters valid, and receives a successful HCI_Command_Complete event in response.
- The Upper Tester sends an HCI_LE_Set_Advertising_Enable command to the IUT with Enable set to 0x01 and receives a successful HCI_Command_Complete event in response.
- The IUT sends an ADV_IND PDU to the Lower Tester.
- The Lower Tester sends a CONNECT_IND PDU to the IUT but does not send any ACL packet to the IUT.
- Perform either alternative 6A, 6B, or 6C depending on the alternative specified in [Table 4.126](#).
Alternative 6A (alternative A is specified):
6A.1 The IUT sends the HCI_LE_Connection_Complete event to the Upper Tester.
Alternative 6B (alternative B is specified):
6B.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester.

Alternative 6C (alternative C is specified):

- 6C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v2] event to the Upper Tester.
- 7. The IUT is sending an HCI_Disconnection_Complete event with reason set to 0x3E (Connection Failed to be established)
- 8. The Upper Tester sends an HCI_LE_Set_Event_Mask command that disables the HCI_LE_Connection_Complete event and enables the [v2] version of the HCI_LE_Enhanced_Connection_Complete event but masks out the [v1] version.

Repeat Steps 2–5.

- 9. Perform either alternative 9A, 9B, or 9C depending on the alternative specified in [Table 4.126](#).

Alternative 9A (alternative A is specified):

- 9A.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.

Alternative 9B (alternative B is specified):

- 9B.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.

Alternative 9C (alternative C is specified):

- 9C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v2] event to the Upper Tester.
- 10. The IUT is sending an HCI_Disconnection_Complete event with reason set to 0x3E (Connection Failed to be established).
- 11. The Upper Tester sends an HCI_LE_Set_Event_Mask command that disables the HCI_LE_Connection_Complete event and enables the [v1] version of the HCI_LE_Enhanced_Connection_Complete event but masks out the [v2] version.

Repeat Steps 2–5.

- 12. Perform either alternative 12A, 12B, or 12C depending on the alternative specified in [Table 4.126](#).

Alternative 12A (alternative A is specified):

- 12A.1 The IUT does not send an HCI_LE_Connection_Complete or HCI_LE_Enhanced_Connection_Complete event.

Alternative 12B (alternative B is specified):

- 12B.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester.

Alternative 12C (alternative C is specified):

- 12C.1 The IUT sends the HCI_LE_Enhanced_Connection_Complete [v1] event to the Upper Tester.
- 13. The IUT is sending an HCI_Disconnection_Complete event with reason set to 0x3E (Connection Failed to be established).
- 14. The Upper Tester sends an HCI_LE_Set_Event_Mask command that enables the HCI_LE_Connection_Complete event and masks out both the [v1] and [v2] versions of the HCI_LE_Enhanced_Connection_Complete event.

Repeat Steps 2–5.

- 15. The IUT sends the HCI_LE_Connection_Complete event to the Upper Tester.
- 16. The IUT is sending an HCI_Disconnection_Complete event with reason set to 0x3E (Connection Failed to be established).

- Expected Outcome

Pass verdict

The IUT sends the HCI_LE_Connection_Complete event in Steps 6A.1 and 15.

The IUT sends the [v1] versions of the events in Steps 6B.1, 12B.1, and 12C.1.

The IUT sends the [v2] versions of the events in Steps 6C.1 and 9C.1.

The IUT does not send an event in Steps 9A.1, 9B.1, and 12A.1.

5 Test case mapping

The Test Case Mapping Table (TCMT) maps test cases to specific requirements in the ICS. The IUT is tested in all roles for which support is declared in the ICS document.

The columns for the TCMT are defined as follows:

Item: Contains a logical expression based on specific entries from the associated ICS document. Contains a logical expression (using the operators AND, OR, NOT as needed) based on specific entries from the applicable ICS document(s). The entries are in the form of y/x references, where y corresponds to the table number and x corresponds to the feature number as defined in the ICS document for HCI [2].

If a test case is mandatory within the respective layer, then the y/x reference is omitted.

Feature: A brief, informal description of the feature being tested.

Test Case(s): The applicable test case identifiers are required for Bluetooth Qualification if the corresponding y/x references defined in the Item column are supported. Further details about the function of the TCMT are elaborated in [3].

For the purpose and structure of the ICS/IXIT, refer to [3].

Item	Feature	Test Case(s)
(HCI 1a/1 AND NOT HCI 1/1b) OR (HCI 1a/3 AND NOT HCI 1/1c) OR (HCI 1a/4 AND NOT HCI 1/1d)	Command Complete Event on each supported controller	HCI/GEV/BV-01-C
LL 3/9	Extended Advertising Extended Scanning	HCI/GEV/BV-02-C HCI/GEV/BV-04-C
LL 4/7	Extended Scanning	HCI/GEV/BV-03-C
HCI 1/1	RFU OGF	HCI/GEV/BI-01-C
HCI 1a/1	Reset Command	HCI/DSU/BV-01-C
LL 1/1 AND LL 3/2 AND HCI 1a/4	Reset Command	HCI/DSU/BV-02-C
LL 1/4 AND HCI 1a/4	Reset Command	HCI/DSU/BV-03-C
LL 1/2 AND HCI 1a/4	Reset Command	HCI/DSU/BV-04-C
LL 1/3 AND HCI 1a/4	Reset Command	HCI/DSU/BV-05-C
LL 1/5 AND HCI 1a/4	Reset Command	HCI/DSU/BV-06-C
HCI 1a/3	Reset Command	HCI/DSU/BV-07-C
HCI 16/68 AND CORE 1b/61	Set Min Encryption Key Size, Core v6.1 or earlier	HCI/CCO/BV-21-C HCI/CCO/BI-35-C
HCI 16/68 AND CORE 1a/62	Set Min Encryption Key Size, Core v6.2 or later	HCI/CCO/BV-27-C

Item	Feature	Test Case(s)
HCI 3/1 AND NOT HCI 3/5 AND (HCI 9/6 OR HCI 9/7) AND HCI 1a/1	Read Buffer Size Command, BR/EDR, [e]SCO data over HCI supported	HCI/CFC/BV-01-C
HCI 3/1 AND NOT HCI 3/5 AND (HCI 9/6 OR HCI 9/7) AND HCI 1a/3	Read Buffer Size Command, AMP, [e]SCO data over HCI supported	HCI/CFC/BV-03-C
HCI 3/1 AND NOT HCI 3/5 AND NOT HCI 9/6 AND NOT HCI 9/7 AND HCI 1a/1	Read Buffer Size Command, BR/EDR, [e]SCO data over HCI not supported	HCI/CFC/BV-06-C
HCI 3/1 AND NOT HCI 3/5 AND NOT HCI 9/6 AND NOT HCI 9/7 AND HCI 1a/3	Read Buffer Size Command, AMP, [e]SCO data over HCI not supported	HCI/CFC/BV-07-C
HCI 3/5 AND NOT HCI 3/1	LE Read Buffer Size Command	HCI/CFC/BV-02-C
HCI 3/1 AND HCI 3/5 AND (HCI 9/6 OR HCI 9/7) AND NOT HCI 14/23	Read Buffer Size Command, BR/EDR/LE, Combined Data Buffers, [e]SCO data over HCI supported	HCI/CFC/BV-04-C
HCI 3/1 AND HCI 3/5 AND (HCI 9/6 OR HCI 9/7) AND HCI 14/23	Read Buffer Size Command, BR/EDR/LE, Separate Data Buffers, [e]SCO data over HCI supported	HCI/CFC/BV-05-C
HCI 3/1 AND HCI 3/5 AND NOT HCI 9/6 AND NOT HCI 9/7 AND NOT HCI 14/23	Read Buffer Size Command, BR/EDR/LE, Combined Data Buffers, [e]SCO data over HCI not supported	HCI/CFC/BV-08-C
HCI 3/1 AND HCI 3/5 AND NOT HCI 9/6 AND NOT HCI 9/7 AND HCI 14/23	Read Buffer Size Command, BR/EDR/LE, Separate Data Buffers, [e]SCO data over HCI not supported	HCI/CFC/BV-09-C
HCI 3/1 AND NOT HCI 9/6 AND NOT HCI 9/7	Read Buffer Size Command, [e]SCO data over HCI not supported	HCI/CFC/BI-03-C
HCI 3/1 AND (HCI 9/6 OR HCI 9/7)	Read Buffer Size Command, [e]SCO data over HCI supported	HCI/CFC/BI-04-C
HCI 4/2	Read Local Supported Commands command [v1]	HCI/CIN/BV-03-C
HCI 4/2a	Read Local Supported Commands command [v2]	HCI/CIN/BV-17-C

Item	Feature	Test Case(s)
(HCI 1a/1 OR HCI 1a/3) AND HCI 4/3	Read Local Supported Features Command	HCI/CIN/BV-01-C
(HCI 1a/1 OR HCI 1a/3) AND HCI 4/4	Read Local Extended Features Command	HCI/CIN/BV-02-C
HCI 4/1	Read Local Version Information Command	HCI/CIN/BV-04-C
HCI 1a/4	LE Filter Accept List	HCI/CIN/BV-06-C
HCI 4/12	Read Local Simple Pairing Options Command	HCI/CIN/BV-08-C
HCI 4/10	Read Local Supported Codecs [v1]	HCI/CIN/BV-10-C
HCI 4/13 AND HCI 4/14 AND HCI 4/15	Locally supported Codecs	HCI/CIN/BV-11-C
HCI 4/8	LE Read Local Supported Features Page 0 Command	HCI/CIN/BV-12-C
HCI 4/18	LE Read All Local Supported Features Page 0 Command	HCI/CIN/BV-15-C
HCI 15/4a	Read RSSI Value, BR/EDR	HCI/CIN/BV-13-C
HCI 15/4c	Read RSSI Value, LE Controller	HCI/CIN/BV-14-C
HCI 5/27 OR HCI 5/28 OR HCI 5/29 OR HCI 5/30	LE Resolving List Management	HCI/CCO/BV-12-C HCI/CCO/BV-13-C HCI/CCO/BV-14-C HCI/CCO/BI-46-C HCI/CCO/BI-47-C HCI/CCO/BI-48-C
HCI 7/39 AND HCI 5/27 AND HCI 6/20	LE Add Device To Resolving List, Scanner	HCI/CCO/BI-50-C
HCI 7/39 AND HCI 6/15 AND LL 3/2	LE Add Device To Resolving List, Advertiser, Connectable	HCI/CCO/BI-69-C
HCI 7/39 AND HCI 6/15 AND NOT LL 3/2 AND LL 3/5	LE Add Device To Resolving List, Advertiser, Non-Connectable	HCI/CCO/BI-70-C
HCI 7/23 AND LL 1/3 AND LL 2/2	Reject Create Connection Command, Random Device Address	HCI/CCO/BI-51-C
HCI 7/23 AND LL 1/3 AND LL 2/4 AND LL 5/3	Reject Create Connection Command, Resolvable Private Address, Filter Accept List Used or Not Used	HCI/CCO/BI-52-C HCI/CCO/BI-53-C
HCI 7/41 AND LL 1/3 AND LL 2/2	Reject Extended Create Connection Command, Random Device Address	HCI/CCO/BI-54-C
HCI 7/41 AND LL 1/3 AND LL 2/4 AND LL 5/3	Reject Extended Create Connection Command, Random Device Address, Filter Accept List Used or Not Used	HCI/CCO/BI-55-C HCI/CCO/BI-56-C
HCI 13/10	LE Set Default PHY Command	HCI/CCO/BV-15-C

Item	Feature	Test Case(s)
HCI 14/17 AND HCI 14/18 AND HCI 14/19	LE Add Device To Periodic Advertiser List Command, LE Remove Device From Periodic Advertiser List Command, LE Clear Periodic Advertiser List Command	HCI/CCO/BV-17-C
HCI 14/20	LE Read Periodic Advertiser List Size Command	HCI/CCO/BV-16-C
HCI 5/44	LE Read Transmit Power Command	HCI/CCO/BV-18-C
HCI 5/45	LE Write RF Path Compensation Command	HCI/CCO/BV-19-C
HCI 5/46	LE Read RF Path Compensation Command	HCI/CCO/BV-20-C
LL 9/13 AND LL 1/1	LE Resolving List and Advertising	HCI/CCO/BI-01-C
LL 9/13 AND LL 1/2	LE Resolving List and Scanning	HCI/CCO/BI-02-C
LL 9/13 AND LL 1/3 AND HCI 7/23	LE Resolving List and Create Connection	HCI/CCO/BI-03-C
LL 9/13 AND LL 1/3 AND HCI 7/41	LE Resolving List and Extended Create Connection	HCI/CCO/BI-04-C
LL 9/13 AND LL 4/8	LE Resolving List and Periodic Advertising	HCI/CCO/BI-05-C
HCI 7/1 AND NOT LMP 2/1	Validate Unsupported Packet Types are Not Accepted, Create Connection, 3-slot	HCI/CCO/BI-14-C
HCI 7/1 AND NOT LMP 2/2	Validate Unsupported Packet Types are Not Accepted, Create Connection, 5-slot	HCI/CCO/BI-15-C
HCI 7/1 AND CORE 1a/60	Create Connection, Invalid Address	HCI/CCO/BI-118-C
HCI 7/29 AND CORE 1a/60	Truncated Page, Invalid Address	HCI/CCO/BI-119-C
HCI 7/50	LE Set Default Subrate	HCI/CCO/BI-120-C
HCI 13/6 AND NOT LMP 2/1	Validate Unsupported Packet Types are Not Accepted, Change Connection Packet Type, 3-slot	HCI/CCO/BI-16-C
HCI 13/6 AND NOT LMP 2/2	Validate Unsupported Packet Types are Not Accepted, Change Connection Packet Type, 5-slot	HCI/CCO/BI-17-C
HCI 15/8	LE Read Channel Map	HCI/CCO/BI-43-C
HCI 1a/1 AND (NOT HCI 16/47a) AND HCI 16/47b	Error Response for Unsupported Transports on Commands, Read Authenticated Payload Timeout, BR/EDR	HCI/CCO/BI-18-C
HCI 1a/4 AND HCI 16/47a AND (NOT HCI 16/47b)	Error Response for Unsupported Transports on Commands, Read Authenticated Payload Timeout, LE	HCI/CCO/BI-19-C
HCI 1a/1 AND (NOT HCI 15/3a) AND HCI 15/3b	Error Response for Unsupported Transports on Commands, Read Link Quality, BR/EDR	HCI/CCO/BI-20-C
HCI 1a/3 AND HCI 15/3a AND (NOT HCI 15/3b)	Error Response for Unsupported Transports on Commands, Read Link Quality, AMP	HCI/CCO/BI-21-C

Item	Feature	Test Case(s)
HCI 1a/1 AND (NOT HCI 13/1a) AND HCI 13/1b	Error Response for Unsupported Transports on Commands, Read Link Supervision Timeout, BR/EDR	HCI/CCO/BI-22-C
HCI 1a/1 AND (NOT HCI 8/8a) AND HCI 8/8b	Error Response for Unsupported Transports on Commands, Read Remote Version Information, BR/EDR	HCI/CCO/BI-23-C
HCI 1a/4 AND HCI 8/8a AND (NOT HCI 8/8b)	Error Response for Unsupported Transports on Commands, Read Remote Version Information, LE	HCI/CCO/BI-24-C
HCI 1a/1 AND (NOT HCI 15/4a) AND HCI 15/4b AND HCI 15/4c	Error Response for Unsupported Transports on Commands, Read RSSI, BR/EDR	HCI/CCO/BI-25-C
HCI 1a/3 AND HCI 15/4a AND (NOT HCI 15/4b) AND HCI 15/4c	Error Response for Unsupported Transports on Commands, Read RSSI, AMP	HCI/CCO/BI-26-C
HCI 1a/4 AND HCI 15/4a AND HCI 15/4b AND (NOT HCI 15/4c)	Error Response for Unsupported Transports on Commands, Read RSSI, LE	HCI/CCO/BI-27-C
HCI 1a/1 AND (NOT HCI 15/2b) AND HCI 15/2c	Error Response for Unsupported Transports on Commands, Read Transmit Power Level, BR/EDR	HCI/CCO/BI-28-C
HCI 1a/4 AND HCI 15/2b AND (NOT HCI 15/2c)	Error Response for Unsupported Transports on Commands, Read Transmit Power Level, LE	HCI/CCO/BI-29-C
HCI 1a/1 AND (NOT HCI 16/48a) AND HCI 16/48b	Error Response for Unsupported Transports on Commands, Write Authenticated Payload Timeout, BR/EDR	HCI/CCO/BI-30-C
HCI 1a/4 AND HCI 16/48a AND (NOT HCI 16/48b)	Error Response for Unsupported Transports on Commands, Write Authenticated Payload Timeout, LE	HCI/CCO/BI-31-C
HCI 1a/1 AND (NOT HCI 13/2a) AND HCI 13/2b	Error Response for Unsupported Transports on Commands, Write Link Supervision Timeout, BR/EDR	HCI/CCO/BI-32-C
HCI 5/37 AND LL 9/43	Invalid LE Set Periodic Advertising Data Parameters, Periodic Advertising ADI Supported	HCI/CCO/BI-33-C
HCI 5/41 AND NOT LL 9/43	Invalid LE Set Periodic Advertising Enable Parameters	HCI/CCO/BI-34-C
HCI 6/37 AND NOT LL 9/43	Invalid LE Set Periodic Advertising Receive Enable, Periodic Advertising ADI Not Supported	HCI/CCO/BI-59-C
HCI 10/27 AND NOT LL 9/43	Invalid LE Set Periodic Advertising Sync Transfer Parameters, Periodic Advertising ADI Not Supported	HCI/CCO/BI-60-C
HCI 10/28 AND NOT LL 9/43	Invalid LE Set Default Periodic Advertising Sync Transfer Parameters, Periodic Advertising ADI Not Supported	HCI/CCO/BI-61-C

Item	Feature	Test Case(s)
HCI 7/50	Invalid Default Subrate Parameters	HCI/CCO/BI-37-C
HCI 7/51	Invalid Subrate Requests	HCI/CCO/BI-36-C
HCI 10/20 AND LL 9/45	Invalid LE Connection CTE Request Enable Parameters	HCI/CCO/BI-38-C
HCI 16/48b AND LL 9/45	Invalid Write Authenticated Payload Timeout Parameters	HCI/CCO/BI-39-C
HCI 5/66	Configure Data Path	HCI/CCO/BI-42-C
HCI 20/5 AND NOT LL 9/31 AND NOT LL 9/32	Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller, Connected Isochronous Stream	HCI/CCO/BI-44-C
HCI 20/5 AND NOT LL 9/45	Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller, Connection Subrating	HCI/CCO/BI-45-C
HCI 20/5 AND NOT LL 9/48	Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller, Advertising Coding Selection	HCI/CCO/BI-121-C
HCI 20/5 AND NOT LL 9/56	Reject Setting Host Controlled FeatureSet Bit, Unsupported Feature on Controller, Channel Sounding	HCI/CCO/BI-122-C
HCI 20/5 AND LL 5/1 AND LL 9/60	LE Set Host Feature, During Connection, Initiator	HCI/CSE/BV-08-C
HCI 20/5 AND LL 3/1 AND LL 9/60	LE Set Host Feature, During Connection, Advertiser	HCI/CSE/BV-09-C
HCI 15/5	Read Clock Offset, Peripheral	HCI/CCO/BV-22-C
HCI 4/13 AND HCI 5/54 AND (LL 9/31 OR LL 9/32)	LE Setup ISO Data Path, CIS	HCI/CCO/BI-57-C
HCI 4/13 AND HCI 5/54 AND LL 9/33	LE Setup ISO Data Path, BIS, Isochronous Broadcaster	HCI/CCO/BI-58-C
HCI 5/54 AND LL 9/34 AND HCI 4/13	LE Setup ISO Data Path, BIS, Synchronized Receiver	HCI/CCO/BI-62-C
HCI 5/34a AND LL 9/9 AND NOT LL 9/48	LE Set Extended Advertising Parameters, Advertising Coding Selection not supported	HCI/CCO/BV-23-C
HCI 7/41a	LE Extended Create Connection [v2]	HCI/CCO/BI-63-C
HCI 5/35	LE Set Periodic Advertising Parameters [v1]	HCI/CCO/BI-64-C
HCI 5/35a	LE Set Periodic Advertising Parameters [v2]	HCI/CCO/BI-65-C
HCI 6/51	LE Set Periodic Advertising Response Data	HCI/CCO/BI-66-C HCI/DDI/BI-73-C
HCI 5/69	LE Set Periodic Advertising Subevent Data	HCI/DDI/BI-71-C HCI/DDI/BI-72-C
HCI 5/69 AND CORE 1b/54	LE Set Periodic Advertising Subevent Data, v5.4 or earlier	HCI/CCO/BI-67-C
HCI 5/69 AND CORE 1a/60	LE Set Periodic Advertising Subevent Data, v6.0 or later	HCI/CCO/BI-124-C
HCI 6/50	LE Set Periodic Sync Subevent	HCI/CCO/BI-68-C

Item	Feature	Test Case(s)
LL 9/52	Monitoring Advertising	HCI/CCO/BV-24-C HCI/CCO/BI-71-C
HCI 13/15	LE Frame Space Update	HCI/CCO/BI-75-C
HCI 13/15 AND NOT LL 9/7	LE Frame Space Update, LE 2M PHY	HCI/CCO/BI-76-C
HCI 13/15 AND NOT LL 9/9	LE Frame Space Update, LE Coded PHY	HCI/CCO/BI-77-C
HCI 13/15 AND NOT (LL 9/31 OR LL 9/32)	LE Frame Space Update, CIS not supported	HCI/CCO/BI-78-C
LL 9/56	Channel Sounding Commands, Channel Sounding Host Support Bit Not Set	HCI/CCO/BI-107-C
HCI 21/1 AND LL 13/4 AND NOT LL 13/5	LE CS Read Local Supported Capabilities, RTT Access Address, 10 ns	HCI/CCO/BI-128-C
HCI 21/1a AND LL 13/4 AND NOT LL 13/5 AND LL 13/10	LE CS Read Local Supported Capabilities, RTT Access Address, 10 ns, LE 2M PHY	HCI/CCO/BI-156-C
HCI 21/1 AND NOT LL 13/4 AND LL 13/5	LE CS Read Local Supported Capabilities, RTT Access Address	HCI/CCO/BI-79-C
HCI 21/1 AND LL 13/6 AND NOT LL 13/7	LE CS Read Local Supported Capabilities, RTT Sounding, 10 ns	HCI/CCO/BI-130-C
HCI 21/1a AND LL 13/6 AND NOT LL 13/7 AND LL 13/10	LE CS Read Local Supported Capabilities, RTT Sounding, 10 ns, LE 2M PHY	HCI/CCO/BI-158-C
HCI 21/1 AND NOT (LL 13/6 OR LL 13/7)	LE CS Read Local Supported Capabilities, RTT Sounding, Unsupported	HCI/CCO/BI-80-C
HCI 21/1 AND LL 13/7 AND NOT LL 13/6	LE CS Read Local Supported Capabilities, RTT Sounding, 150 ns	HCI/CCO/BI-129-C
HCI 21/1a AND LL 13/7 AND NOT LL 13/6 AND LL 13/10	LE CS Read Local Supported Capabilities, RTT Sounding, 150 ns, LE 2M PHY	HCI/CCO/BI-157-C
HCI 21/1 AND LL 13/8 AND NOT LL 13/9	LE CS Read Local Supported Capabilities, RTT Random Sequence, 10 ns	HCI/CCO/BI-132-C
HCI 21/1a AND LL 13/8 AND NOT LL 13/9 AND LL 13/10	LE CS Read Local Supported Capabilities, RTT Random Sequence, 10 ns, LE 2M PHY	HCI/CCO/BI-160-C
HCI 21/1 AND NOT (LL 13/8 OR LL 13/9)	LE CS Read Local Supported Capabilities, RTT Random Sequence, Unsupported	HCI/CCO/BI-81-C

Item	Feature	Test Case(s)
HCI 21/1 AND LL 13/9 AND NOT LL 13/8	LE CS Read Local Supported Capabilities, RTT Random Sequence, 150 ns	HCI/CCO/BI-131-C
HCI 21/1a AND LL 13/9 AND NOT LL 13/8 AND LL 13/10	LE CS Read Local Supported Capabilities, RTT Random Sequence, 150 ns, LE 2M PHY	HCI/CCO/BI-159-C
HCI 21/2	LE CS Read Remote Supported Capabilities	HCI/CCO/BV-26-C HCI/CCO/BI-98-C
HCI 21/2 AND LL 1/5	LE CS Read Remote Supported Capabilities, Central	HCI/CCO/BI-108-C
HCI 21/2 AND LL 1/4	LE CS Read Remote Supported Capabilities, Peripheral	HCI/CCO/BI-109-C
HCI 21/4	LE CS Security Enable	HCI/CCO/BI-99-C
HCI 21/4 AND LL 1/5	LE CS Security Enable, Central	HCI/CCO/BI-82-C HCI/CCO/BI-148-C
HCI 21/4 AND LL 1/4	LE CS Security Enable, Peripheral	HCI/CCO/BI-83-C
HCI 21/5 AND LL 1/7	LE CS Set Default Settings, Initiator	HCI/CCO/BI-84-C
HCI 21/5 AND LL 1/8	LE CS Set Default Settings, Reflector	HCI/CCO/BI-85-C
HCI 21/5 AND NOT LL 1/7	LE CS Set Default Settings, Initiator Not Supported	HCI/CCO/BI-86-C
HCI 21/5 AND NOT LL 1/8	LE CS Set Default Settings, Reflector Not Supported	HCI/CCO/BI-87-C
HCI 21/5	LE CS Set Default Settings	HCI/CCO/BI-88-C HCI/CCO/BI-100-C
HCI 21/6 AND LL 1/8	LE CS Read Remote FAE Table, FAE Not Supported, Reflector Role	HCI/CCO/BI-89-C
HCI 21/6	LE CS Read Remote FAE Table	HCI/CCO/BI-101-C
HCI 21/7 AND LL 1/8	LE CS Write Remote FAE Table, FAE Not Supported, Reflector Role	HCI/CCO/BI-90-C
HCI 21/7	LE CS Write Remote FAE Table	HCI/CCO/BI-102-C
HCI 21/8	LE CS Create Config	HCI/CCO/BI-91-C HCI/CCO/BI-93-C HCI/CCO/BI-103-C HCI/CCO/BI-106-C HCI/CCO/BI-92-C HCI/CCO/BI-112-C
HCI 21/9	LE CS Remove Config	HCI/CCO/BI-94-C HCI/CCO/BI-104-C
HCI 21/11	LE CS Set Procedure Parameters	HCI/CCO/BI-95-C HCI/CCO/BI-96-C HCI/CCO/BI-115-C HCI/CCO/BI-149-C

Item	Feature	Test Case(s)
HCI 21/11 AND CORE 1b/60	LE CS Set Procedure Parameters, v6.0 or earlier	HCI/CCO/BI-116-C
HCI 21/11 AND CORE 1a/61	LE CS Set Procedure Parameters, v6.1 or later	HCI/CCO/BI-123-C
HCI 21/11 AND NOT LL 9/7	LE CS Set Procedure Parameters, Unsupported PHY, LE 2M PHY	HCI/CCO/BI-125-C
HCI 21/11 AND NOT LL 9/9	LE CS Set Procedure Parameters, Unsupported PHY, LE Coded PHY	HCI/CCO/BI-126-C HCI/CCO/BI-127-C
HCI 21/12	LE CS Procedure Enable	HCI/CCO/BI-97-C HCI/CCO/BI-105-C
HCI 21/10	LE CS Set Channel Classification	HCI/CCO/BI-110-C HCI/CCO/BI-111-C
HCI 21/12 AND LL 1/7	LE CS Procedure Enable, Initiator	HCI/CCO/BI-113-C
HCI 21/12 AND LL 1/8	LE CS Procedure Enable, Reflector	HCI/CCO/BI-114-C
HCI 1a/4 AND LL 9/56	Channel Sounding	HCI/CCO/BI-117-C
HCI 21/23 AND NOT (LL 13/2 OR LL 13/3)	CS Set Security Requirements, CS Tone Unsupported	HCI/CCO/BI-150-C
HCI 21/23 AND NOT (LL 13/5 OR LL 13/7 OR LL 13/9)	CS Set Security Requirements, 150 ns RTT accuracy Unsupported	HCI/CCO/BI-151-C
HCI 21/23 AND NOT (LL 13/4 OR LL 13/6 OR LL 13/8)	CS Set Security Requirements, 10 ns RTT accuracy Unsupported	HCI/CCO/BI-152-C
HCI 21/23 AND NOT (LL 13/4 OR LL 13/5 OR LL 13/6 OR LL 13/7 OR LL 13/8 OR LL 13/9)	CS Set Security Requirements, RTT Unsupported	HCI/CCO/BI-153-C
HCI 21/23 AND NOT (CS 2/14a OR CS 2/14b OR CS 2/16)	CS Set Security Requirements, NADM Unsupported	HCI/CCO/BI-154-C
HCI 21/23	CS Set Security Requirements	HCI/CCO/BI-155-C
HCI 20/5 AND NOT LL 9/69	Reject Setting Host Controlled FeatureSet bit, unsupported feature on controller, Connection Rate procedure	HCI/CCO/BI-133-C
HCI 7/23 AND CORE 1a/62	LE Create Connection, v6.2 or later	HCI/CCO/BI-134-C
HCI 7/53 AND LL 1/4	LE Connection Rate Request, Peripheral	HCI/CCO/BI-135-C
HCI 7/53 AND LL 6/10a	LE Connection Rate Request, Peripheral, LE Connection Update	HCI/CCO/BI-147-C HCI/CCO/BI-139-C

Item	Feature	Test Case(s)
HCI 7/53 AND LL 1/5	LE Connection Rate Request, Central	HCI/CCO/BI-136-C
HCI 7/53	LE Connection Rate Request	HCI/CCO/BI-137-C
HCI 7/53	LE Connection Rate Request, LE 1M	HCI/CCO/BI-143-C
HCI 7/53	LE Connection Rate Request, LE 1M, DLE	HCI/CCO/BI-144-C
HCI 7/53 AND LL 9/9	LE Connection Rate Request, LE Coded	HCI/CCO/BI-145-C
HCI 7/53 AND LL 9/9	LE Connection Rate Request, LE Coded, DLE	HCI/CCO/BI-146-C
HCI 7/55 AND LL 1/5	LE Set Default Rate	HCI/CCO/BI-138-C
HCI 7/53 AND HCI 7/51	LE Connection Rate Request, Subrate Request	HCI/CCO/BI-140-C
HCI 7/53 AND LL 9/56 AND LL 1/7	LE Connection Rate Request, Channel Sounding, Initiator	HCI/CCO/BI-141-C
HCI 7/53 AND LL 9/56 AND LL 1/8	LE Connection Rate Request, Channel Sounding, Reflector	HCI/CCO/BI-142-C
HCI 1a/1 AND HCI 6/3 AND HCI 6/4	Periodic Inquiry Mode	HCI/DDI/BV-01-C
HCI 1a/1 AND HCI 6/9 AND HCI 6/10	Inquiry Mode Command	HCI/DDI/BV-02-C
LL 1/1 AND LL 3/2 AND HCI 1a/4 AND HCI 6/15 AND HCI 6/16	LE Set Advertising Enable Command	HCI/DDI/BV-03-C
LL 1/1 AND LL 2/5 AND HCI 1a/4 AND HCI 6/15 AND HCI 6/16	LE Set Advertising Enable Command, RPA	HCI/DDI/BI-06-C
LL 1/2 AND HCI 1a/4 AND HCI 6/20	LE Set Scan Enable Command	HCI/DDI/BV-04-C
LL 1/2 AND LL 2/5 AND HCI 1a/4 AND HCI 6/20	LE Set Scan Enable Command	HCI/DDI/BI-07-C
LL 3/9 AND LL 2/2 AND HCI 5/40	LE Set Extended Advertising Enable Command, Random Address	HCI/DDI/BI-08-C
LL 3/9 AND LL 2/5 AND HCI 5/40	LE Set Extended Advertising Enable Command, RPA	HCI/DDI/BI-09-C
LL 3/9 AND HCI 5/40	LE Set Extended Advertising Enable Command	HCI/DDI/BI-12-C
LL 3/10 AND HCI 5/41	LE Set Periodic Advertising Enable Command	HCI/DDI/BI-13-C HCI/DDI/BV-07-C
LL 1/2 AND (LL 2/2 OR LL 2/5) AND HCI 1a/4 AND HCI 6/28	LE Set Extended Scan Enable Command	HCI/DDI/BI-11-C

Item	Feature	Test Case(s)
LL 1/2 AND HCI 1a/4 AND HCI 6/27 AND HCI 6/28	LE Set Extended Scan Enable Command – Default Parameters	HCI/DDI/BV-06-C
(HCI 1a/1 OR HCI 1a/3) AND HCI 6/24	Read Extended Inquiry Length Command	HCI/DDI/BV-05-C
HCI 5/34 AND LL 1/1	LE Set Extended Advertising Parameters Command	HCI/DDI/BI-01-C
HCI 5/34 AND CORE 1a/60	LE Set Extended Advertising Parameters Command, Decision-Based Advertising Filtering, v6.0 or later	HCI/DDI/BI-69-C
HCI 6/16 AND LL 3/9	LE Set Advertising Parameters Command	HCI/DDI/BI-02-C
HCI 6/16 AND LL 3/10	LE Set Periodic Advertising Parameters Command	HCI/DDI/BI-67-C
HCI 6/30 AND NOT HCI 6/37	Create periodic advertising sync without possibility to enable reports later	HCI/DDI/BI-03-C
HCI 6/30	Reject LE Periodic Advertising Create Sync Command to a synchronized Advertising Set	HCI/DDI/BI-04-C HCI/DDI/BV-12-C
LL 4/7	LE Set Extended Scan Parameters With Unsupported PHY	HCI/DDI/BI-05-C
HCI 5/37	Invalid LE Set Periodic Advertising Data Parameters	HCI/DDI/BI-14-C HCI/DDI/BI-70-C
LL 3/10 AND HCI 5/35	LE Set Periodic Advertising Parameters, Reject, Data Too Long, LE 1M PHY	HCI/DDI/BI-50-C
LL 3/10 AND LL 9/9 AND HCI 5/35	LE Set Periodic Advertising Parameters, Reject, Data Too Long, LE Coded PHY	HCI/DDI/BI-51-C
LL 3/10 AND HCI 5/34 AND LL 3/1	LE Set Extended Advertising Parameters Command, Reject, Anonymous, undirected	HCI/DDI/BI-15-C HCI/DDI/BI-53-C
LL 3/10 AND HCI 5/34 AND LL 3/1a	LE Set Extended Advertising Parameters Command, Reject, Anonymous, directed	HCI/DDI/BI-16-C HCI/DDI/BI-54-C
LL 3/10 AND HCI 5/34 AND LL 3/2	LE Set Extended Advertising Parameters Command, Reject, Connectable and scannable undirected	HCI/DDI/BI-17-C HCI/DDI/BI-55-C
LL 3/10 AND HCI 5/34 AND LL 3/4 AND LL 3/4a	LE Set Extended Advertising Parameters Command, Reject, Connectable directed (low duty cycle)	HCI/DDI/BI-18-C
LL 3/10 AND HCI 5/34 AND LL 3/4	LE Set Extended Advertising Parameters Command, Reject, Connectable directed	HCI/DDI/BI-19-C HCI/DDI/BI-23-C HCI/DDI/BI-59-C
LL 3/10 AND HCI 5/34 AND LL 3/5	LE Set Extended Advertising Parameters Command, Reject, Scannable undirected	HCI/DDI/BI-20-C HCI/DDI/BI-24-C HCI/DDI/BI-56-C HCI/DDI/BI-60-C

Item	Feature	Test Case(s)
LL 3/10 AND HCI 5/34 AND LL 3/1	LE Set Extended Advertising Parameters Command, Reject, Non-connectable and non- scannable, undirected	HCI/DDI/BI-21-C HCI/DDI/BI-57-C
LL 3/10 AND HCI 5/34 AND LL 3/4b	LE Set Extended Advertising Parameters Command, Reject, Connectable undirected	HCI/DDI/BI-22-C HCI/DDI/BI-58-C
LL 3/10 AND HCI 5/34 AND LL 3/5a	LE Set Extended Advertising Parameters Command, Reject, Scannable directed	HCI/DDI/BI-25-C HCI/DDI/BI-61-C
LL 3/10 AND HCI 5/37	LE Set Periodic Advertising Data, Reject, Data Too Long	HCI/DDI/BI-52-C
LL 3/10 AND HCI 5/35 AND LL 3/1	LE Set Periodic Advertising Parameters Command, Reject, Anonymous, undirected	HCI/DDI/BI-26-C
LL 3/10 AND HCI 5/35 AND LL 3/1a	LE Set Periodic Advertising Parameters Command, Reject, Anonymous, directed	HCI/DDI/BI-27-C
LL 3/10 AND HCI 5/35 AND LL 3/2	LE Set Periodic Advertising Parameters Command, Reject, Connectable and scannable undirected	HCI/DDI/BI-28-C
LL 3/10 AND HCI 5/35 AND LL 3/4 AND LL 3/4a	LE Set Periodic Advertising Parameters Command, Reject, Connectable directed (low duty cycle)	HCI/DDI/BI-29-C
LL 3/10 AND HCI 5/35 AND LL 3/4	LE Set Periodic Advertising Parameters Command, Reject, Connectable directed	HCI/DDI/BI-30-C HCI/DDI/BI-34-C
LL 3/10 AND HCI 5/35 AND LL 3/5	LE Set Periodic Advertising Parameters Command, Reject, Scannable undirected	HCI/DDI/BI-31-C HCI/DDI/BI-35-C
LL 3/10 AND HCI 5/35 AND LL 3/1	LE Set Periodic Advertising Parameters Command, Reject, Non-connectable and non- scannable, undirected	HCI/DDI/BI-32-C
LL 3/10 AND HCI 5/35 AND LL 3/4b	LE Set Periodic Advertising Parameters Command, Reject, Connectable undirected	HCI/DDI/BI-33-C
LL 3/10 AND HCI 5/35 AND LL 3/5a	LE Set Periodic Advertising Parameters Command, Reject, Scannable directed	HCI/DDI/BI-36-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/1	LE Set Periodic Advertising Enable Command, Reject, Anonymous, undirected	HCI/DDI/BI-37-C
LL 3/10 AND HCI 5/34 AND HCI 5/41	LE Set Periodic Advertising Enable Command, Reject, Anonymous, directed	HCI/DDI/BI-38-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/2	LE Set Periodic Advertising Enable Command, Reject, Connectable and scannable undirected	HCI/DDI/BI-39-C

Item	Feature	Test Case(s)
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/4 AND LL 3/4a	LE Set Periodic Advertising Enable Command, Reject, Connectable directed (low duty cycle)	HCI/DDI/BI-40-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/4	LE Set Periodic Advertising Enable Command, Reject, Connectable directed	HCI/DDI/BI-41-C HCI/DDI/BI-45-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/5	LE Set Periodic Advertising Enable Command, Reject, Scannable undirected	HCI/DDI/BI-42-C HCI/DDI/BI-46-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/1	LE Set Periodic Advertising Enable Command, Reject, Non-connectable and non-scannable, undirected	HCI/DDI/BI-43-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/4b	LE Set Periodic Advertising Enable Command, Reject, Connectable undirected	HCI/DDI/BI-44-C
LL 3/10 AND HCI 5/34 AND HCI 5/41 AND LL 3/5a	LE Set Periodic Advertising Enable Command, Reject, Scannable directed	HCI/DDI/BI-47-C
HCI 10/40 AND LL 3/9	LE Set Data Related Address Changes Command	HCI/DDI/BI-48-C
HCI 6/30 AND NOT LL 9/43	LE Periodic Advertising Create Sync Command, Periodic Advertising ADI not supported	HCI/DDI/BI-49-C
HCI 5/41 AND LL 9/43	LE Set Periodic Advertising Enable Parameters, Periodic Advertising ADI Supported	HCI/DDI/BV-09-C
HCI 6/30 AND LL 9/43	LE Periodic Advertising Create Sync Command, Periodic Advertising ADI Supported	HCI/DDI/BV-08-C
HCI 5/34 AND HCI 5/36 AND LL 9/9	LE Set Extended Advertising Parameters, Packet Too Long, LE Coded PHY	HCI/DDI/BI-62-C
HCI 5/36	LE Set Extended Advertising Data, Packet Too Long	HCI/DDI/BI-63-C
HCI 5/36 AND LL 9/9	LE Set Extended Advertising Data, Packet Too Long, LE Coded PHY	HCI/DDI/BI-64-C
HCI 5/38	LE Set Extended Scan Response Data, Packet Too Long	HCI/DDI/BI-65-C
HCI 5/38 AND LL 9/9	LE Set Extended Scan Response Data, Packet Too Long, LE Coded PHY	HCI/DDI/BI-66-C
HCI 6/27 AND NOT LL 9/51 AND CORE 1a/60	LE Set Extended Scan Parameters, Decision- Based Advertising Filtering not supported, v6.0 or later	HCI/DDI/BI-68-C

Item	Feature	Test Case(s)
HCI 7/41 AND NOT LL 9/51 AND CORE 1a/60	LE Extended Create Connection, Decision-Based Advertising Filtering not supported, v6.0 or later	HCI/CCO/BI-72-C
HCI 5/32a	LE Set Resolvable Private Address Timeout [v2]	HCI/DDI/BI-74-C HCI/DDI/BV-10-C HCI/DDI/BV-11-C
HCI 5/70	LE Set Decision Data	HCI/CCO/BI-73-C
HCI 5/71	LE Set Decision Instructions	HCI/CCO/BI-74-C HCI/CCO/BV-25-C
(HCI 1a/1 OR HCI 1a/3) AND HCI 7/33	Read Extended Page Timeout Command	HCI/CCO/BV-08-C
HCI 10/12	LE Set Data Length Command	HCI/CCO/BV-09-C HCI/CCO/BI-40-C
HCI 10/14	LE Read Suggested Default Data Length Command	HCI/CCO/BV-10-C
HCI 10/15	LE Write Suggested Default Data Length Command	HCI/CCO/BV-11-C
(HCI 1a/1 OR HCI 1a/3) AND HCI 14/2	Set Event Mask Command	HCI/HFC/BV-01-C
HCI 1a/1 AND HCI 14/3	Set Event Filter Command	HCI/HFC/BV-02-C HCI/HFC/BV-05-C HCI/HFC/BV-06-C HCI/HFC/BV-07-C HCI/HFC/BV-08-C HCI/HFC/BV-11-C
HCI 1a/1 AND HCI 14/3 AND LMP 2/12	Set Event Filter Command, SCO	HCI/HFC/BV-09-C HCI/HFC/BV-12-C
HCI 1a/1 AND HCI 14/3 AND LMP 2/15	Set Event Filter Command, eSCO	HCI/HFC/BV-10-C HCI/HFC/BV-13-C
HCI 1a/1 AND HCI 16/15 AND (NOT HCI 16/27)	Link Key Commands – IUT does not support SPP	HCI/AEN/BV-01-C
HCI 1a/1 AND HCI 16/15 AND HCI 16/27	Link Key Commands	HCI/AEN/BV-02-C HCI/AEN/BV-03-C HCI/AEN/BV-04-C
HCI 16/50 AND HCI 16/52	LE Read Local P-256 Public Key, LE Read Local P-256 Public Key Complete	HCI/AEN/BV-06-C
HCI 16/51 AND HCI 16/53	LE Generate DHKey, LE Generate DHKey Complete Event	HCI/AEN/BV-07-C
HCI 1a/1 AND HCI 16/44	Read Local OOB Extended Data Command	HCI/AEN/BV-05-C HCI/AEN/BV-09-C

Item	Feature	Test Case(s)
HCI 16/51 AND HCI 16/53 AND CORE 1b/54	LE Generate DHKey, Invalid Point, v5.4 and earlier	HCI/AEN/BI-01-C
HCI 16/51 AND HCI 16/53 AND CORE 1a/60	LE Generate DHKey, Invalid Point, v6.0 and later	HCI/AEN/BI-02-C
HCI 16/53 AND HCI 16/51a	LE Generate DHKey [v2]	HCI/AEN/BV-08-C
HCI 1a/3 AND (HCI 5/11 OR HCI 5/12)	Write Location Data Command/ Read Location Data Command	HCI/CCO/BV-01-C
HCI 1a/3 AND HCI 7/20	Logical Link Cancel Command	HCI/CSE/BV-01-C HCI/CSE/BV-02-C HCI/CSE/BI-03-C HCI/CSE/BI-04-C
HCI 1a/3 AND (HCI 7/21 OR HCI 7/22)	Logical Link Accept Timeout	HCI/CSE/BV-05-C
HCI 14/8 AND HCI 14/22	Set Event Mask 2 Command, Data Block Based Flow Control	HCI/HFC/BV-03-C
LL 1/2 AND HCI 14/14	LE Set Event Mask [v1] command – Scanning state	HCI/HFC/BV-04-C
LL 1/2 AND HCI 14/14a	LE Set Event Mask [v2] command – Scanning state	HCI/HFC/BV-20-C
(NOT LL 1/2) AND LL 1/3 AND HCI 14/14	LE Set Event Mask [v1] command – Initiating state	HCI/HFC/BV-14-C
(NOT LL 1/2) AND LL 1/3 AND HCI 14/14a	LE Set Event Mask [v2] command – Initiating state	HCI/HFC/BV-21-C
LL 1/1 AND NOT LL 1/2 AND NOT LL 1/3 AND LL 1/4 AND HCI 14/14	LE Set Event Mask [v1] command – Advertising state	HCI/HFC/BV-15-C
LL 1/1 AND NOT LL 1/2 AND NOT LL 1/3 AND LL 1/4 AND HCI 14/14a	LE Set Event Mask [v2] command – Advertising state	HCI/HFC/BV-22-C
LL 1/1 AND NOT LL 1/2 AND NOT LL 1/3 AND NOT LL 1/4 AND HCI 14/14 AND HCI 16/52	LE Set Event Mask command, LE Read Local P-256 Public Key	HCI/HFC/BV-17-C

Item	Feature	Test Case(s)
LL 1/1 AND NOT LL 1/2 AND NOT LL 1/3 AND NOT LL 1/4 AND HCI 14/14 AND NOT HCI 16/52 AND HCI 16/53	LE Set Event Mask command, LE Generate DHKey [v1]	HCI/HFC/BV-18-C
LL 1/1 AND NOT LL 1/2 AND NOT LL 1/3 AND NOT LL 1/4 AND LL 3/9 AND HCI 14/14 AND NOT HCI 16/52 AND NOT HCI 16/53	LE Set Event Mask command, Advertising Set Terminated	HCI/HFC/BV-19-C
HCI 14/15 AND HCI 14/16	Write LE Host Support	HCI/CCO/BV-03-C
HCI 1a/1 AND (NOT HCI 1a/4)	LE Not Supported	HCI/CCO/BV-05-C
HCI 1a/4 AND (NOT HCI 1a/1)	BR/EDR Not Supported	HCI/CCO/BV-07-C
LL 9/25	Read LE Public Key Validation Feature Bit	HCI/CIN/BV-09-C
HCI 7/39 AND LL 1/5	LE Read Peer Resolvable Address Command – Central	HCI/CM/BV-01-C
HCI 7/40 AND LL 1/5	LE Read Local Resolvable Address Command – Central	HCI/CM/BV-02-C
HCI 13/9	LE Read PHY Command	HCI/CM/BV-03-C
LL 2/7 AND LL 2/5 AND HCI 7/38 AND HCI 7/41	Extended Scanning with Device Privacy, RPA Timeout During Connection Initiation	HCI/CM/BV-04-C
HCI 7/39 AND LL 1/4	LE Read Peer Resolvable Address Command – Peripheral	HCI/CM/BV-05-C
HCI 7/40 AND LL 1/4	LE Read Local Resolvable Address Command – Peripheral	HCI/CM/BV-06-C
LL 5/4 AND LL 5/1	LE Extended Create Connection With Unsupported PHY	HCI/CM/BI-01-C
HCI 3/6	Sleep Clock Accuracy	HCI/CM/BV-07-C
HCI 7/23 AND HCI 7/24	LE Create Connection Cancel Command, LE Create Connection	HCI/CM/BI-02-C
HCI 7/24 AND HCI 7/41	LE Create Connection Cancel Command, LE Extended Create Connection	HCI/CM/BI-03-C
HCI 7/23 AND CORE 1a/60	LE Create Connection, v6.0 or later	HCI/CM/BI-04-C
(HCI 7/41 OR HCI 7/41a) AND CORE 1a/60	LE Extended Create Connection, v6.0 or later	HCI/CM/BI-05-C

Item	Feature	Test Case(s)
HCI 18/5 AND HCI 18/8 AND HCI 18/9 AND HCI 18/7 AND HCI 18/1 AND HCI 18/3 AND HCI 18/10	Connectionless Peripheral Broadcast Transmission	HCI/CPB/BV-01-C
HCI 18/6	Delete Reserved LT_ADDR	HCI/CPB/BV-02-C
HCI 18/14	Connectionless Peripheral Broadcast Channel Map Change	HCI/CPB/BV-03-C
HCI 18/4 AND HCI 18/11 AND HCI 18/2 AND HCI 18/12	Connectionless Peripheral Broadcast Reception	HCI/CPB/BV-04-C
HCI 18/13	Connectionless Peripheral Broadcast Timeout	HCI/CPB/BV-05-C
HCI 7/29 AND HCI 7/31	Truncated Page, Truncated Page Complete	HCI/CSE/BV-06-C
HCI 7/32	Page Response Timeout	HCI/CSE/BV-07-C
HCI 5/59	LE Enhanced Read Transmit Power Level Command	HCI/PCL/BV-01-C HCI/PCL/BI-04-C
HCI 5/59 AND NOT LL 9/7	LE Enhanced Read Transmit Power Level Command, LE 2M PHY not supported	HCI/PCL/BI-01-C
HCI 5/59 AND NOT LL 9/9	LE Enhanced Read Transmit Power Level Command, LE Coded PHY not supported	HCI/PCL/BI-02-C HCI/PCL/BI-03-C
HCI 8/10	LE Read Remote Transmit Power Level Command	HCI/PCL/BI-08-C
HCI 8/10 AND NOT LL 9/7	LE Read Remote Transmit Power Level Command, LE 2M PHY not supported	HCI/PCL/BI-05-C
HCI 8/10 AND NOT LL 9/9	LE Read Remote Transmit Power Level Command, LE Coded PHY not supported	HCI/PCL/BI-06-C HCI/PCL/BI-07-C
LL 9/37 AND HCI 5/59	LE Enhanced Read Transmit Power Level Command, Invalid Host Parameters	HCI/CCO/BI-06-C HCI/CCO/BI-07-C
LL 9/37 AND HCI 8/10	LE Read Remote Transmit Power Level Command, Invalid Host Parameters	HCI/CCO/BI-08-C HCI/CCO/BI-09-C
LL 9/37 AND HCI 5/60	LE Set Path Loss Reporting Parameters Command, Invalid Host Parameters	HCI/CCO/BI-10-C
LL 9/37 AND HCI 5/61	LE Set Path Loss Reporting Enable Command, Invalid Host Parameters	HCI/CCO/BI-11-C
LL 9/37 AND HCI 5/64	LE Set Transmit Power Reporting Enable Command, Invalid Host Parameters	HCI/CCO/BI-12-C
HCI 5/60 AND HCI 5/61	LE Path Loss Monitoring, Invalid Parameters	HCI/CCO/BI-13-C
LL 9/7 AND LL 9/8 AND LL 9/9 AND LL 9/31 AND CORE 1b/54	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Core v5.2 to v5.4	HCI/CIS/BV-01-C

Item	Feature	Test Case(s)
LL 9/7 AND (NOT LL 9/8) AND LL 9/9 AND LL 9/31 AND CORE 1b/54	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Core v5.2 to 5.4	HCI/CIS/BV-02-C
LL 9/7 AND LL 9/9 AND LL 12/2	Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster, all PHYs	HCI/BIS/BV-01-C
NOT (LL 9/7 AND LL 9/9) AND LL 9/8 AND LL 9/31 AND CORE 1b/54	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Core v5.2 to v5.4	HCI/CIS/BV-03-C
NOT (LL 9/7 AND LL 9/9) AND (NOT LL 9/8) AND LL 9/31 AND CORE 1b/54	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Core v5.2 to v5.4	HCI/CIS/BV-04-C
LL 9/7 AND LL 9/8 AND LL 9/9 AND LL 9/31 AND LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Unsegmented Framed mode	HCI/CIS/BV-15-C
LL 9/7 AND (NOT LL 9/8) AND LL 9/9 AND LL 9/31 AND LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Unsegmented Framed mode	HCI/CIS/BV-16-C
NOT (LL 9/7 AND LL 9/9) AND LL 9/8 AND LL 9/31 AND LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Unsegmented Framed mode	HCI/CIS/BV-17-C
NOT (LL 9/7 AND LL 9/9) AND (NOT LL 9/8) AND LL 9/31 AND LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Unsegmented Framed mode	HCI/CIS/BV-18-C
LL 9/7 AND LL 9/8 AND LL 9/9 AND LL 9/31 AND NOT LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, asymmetric PHYs, Core v6.0 or later, Unsegmented Framed mode not supported	HCI/CIS/BV-19-C
LL 9/7 AND (NOT LL 9/8) AND LL 9/9 AND LL 9/31 AND NOT LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, all PHYs, symmetric PHYs only, Core v6.0 or later, Unsegmented Framed mode not supported	HCI/CIS/BV-20-C
NOT (LL 9/7 AND LL 9/9) AND LL 9/8 AND LL 9/31 AND NOT LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, asymmetric PHYs, Core v6.0 or later, Unsegmented Framed mode not supported	HCI/CIS/BV-21-C

Item	Feature	Test Case(s)
NOT (LL 9/7 AND LL 9/9) AND (NOT LL 9/8) AND LL 9/31 AND NOT LL 9/53 AND CORE 1a/60	Connected Isochronous Stream Using Non-Test Command, Central Initiated, not all PHYs, symmetric PHYs only, Core v6.0 or later, Unsegmented Framed mode not supported	HCI/CIS/BV-22-C
NOT (LL 9/7 AND LL 9/9) AND LL 12/2	Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster, not all PHYs	HCI/BIS/BV-02-C
LL 9/9 AND LL 12/2	Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster, LE Coded PHY	HCI/BIS/BV-11-C
LL 9/31	Connected Isochronous Stream, Central	HCI/CIS/BV-05-C HCI/CIS/BV-09-C HCI/CIS/BV-13-C HCI/CIS/BI-01-C HCI/CIS/BI-03-C HCI/CIS/BI-05-C HCI/CIS/BI-10-C HCI/CIS/BI-11-C HCI/CIS/BI-12-C HCI/CIS/BI-13-C HCI/CIS/BI-16-C
LL 9/31 AND HCI 16/48b	Connected Isochronous Stream, HCI Read/Write Authenticated Payload Timeout, Central	HCI/CIS/BI-19-C
LL 9/31 AND LL 9/32	Receiving HCI ISO Data Packets with RFU Bits Set, CIS, Peripheral	HCI/CIS/BI-02-C
LL 9/31 AND HCI 3/9	Connected Isochronous Stream Using Test Command, Central Initiated, Time_Offset	HCI/CIS/BV-06-C HCI/CIS/BV-07-C
LL 9/31 AND HCI 20/4	Connected Isochronous Stream, Central	HCI/CIS/BV-11-C
LL 9/32	Connected Isochronous Stream, Peripheral	HCI/CIS/BV-10-C HCI/CIS/BI-04-C HCI/CIS/BI-07-C HCI/CIS/BI-08-C HCI/CIS/BI-09-C
LL 9/32 AND HCI 16/48b	Connected Isochronous Stream, HCI Read/Write Authenticated Payload Timeout, Peripheral	HCI/CIS/BI-20-C
LL 9/32 AND HCI 3/9	Connected Isochronous Stream, Invalid LE Read ISO TX Sync Parameters, Peripheral	HCI/CIS/BV-08-C
LL 9/32 AND HCI 10/33 AND HCI 10/34	Invalid LE Accept or Reject CIS Request, Premature Setup ISO Data Path, CIS Peripheral	HCI/CIS/BI-06-C
LL 9/32 AND HCI 20/4	Connected Isochronous Stream, Peripheral	HCI/CIS/BV-12-C
LL 1/6 AND LL 9/33	Broadcast Isochronous Stream Using Non-Test Command, Invalid BIG Parameters	HCI/BIS/BI-06-C

Item	Feature	Test Case(s)
LL 1/6 AND LL 9/33 AND NOT LL 9/53	Broadcast Isochronous Stream Using Non-Test Command, Invalid BIG Parameters, Unsegmented Framed mode not supported	HCI/BIS/BI-11-C
LL 9/33 AND HCI 3/9	Broadcast Isochronous Stream Using Test Command, Time_Offset	HCI/BIS/BV-03-C
LL 9/34 AND HCI 3/9	Broadcast Isochronous Stream, Invalid LE Read ISO TX Sync Parameters, Synchronized Receiver	HCI/BIS/BV-04-C
LL 11/4 AND LL 9/34 AND HCI 5/55 AND HCI 6/38	Broadcast Isochronous Stream, Invalid LE BIG Create Sync Parameters and LE Remove ISO Data Path Parameters, Synchronized Receiver	HCI/BIS/BI-08-C
LL 9/34 AND HCI 6/38	Broadcast Isochronous Stream, Invalid LE BIG Create Sync behavior, Synchronized Receiver	HCI/BIS/BI-09-C HCI/BIS/BI-16-C
NOT LL 9/46 AND HCI 5/58	Connected Isochronous Stream, BN > 1 Not Supported	HCI/CIS/BI-14-C
NOT LL 9/47 AND HCI 5/58	Connected Isochronous Stream, FT > 1 Not Supported	HCI/CIS/BI-15-C
LL 11/3	Broadcast Isochronous Stream, Synchronized Receiver, Reject Invalid Commands	HCI/BIS/BI-02-C
LL 11/3 AND HCI 16/48b	Broadcast Isochronous Stream, Synchronized Receiver, HCI Read/Write Authenticated Payload Timeout	HCI/BIS/BI-14-C
LL 12/2	HCI ISO Data Packets, BIS	HCI/BIS/BV-05-C HCI/BIS/BI-01-C
LL 12/2 AND HCI 16/48b	Broadcast Isochronous Stream, Broadcaster, HCI Read/Write Authenticated Payload Timeout	HCI/BIS/BI-12-C
LL 9/34 AND HCI 20/4	Broadcast Isochronous Stream, Synchronized Receiver	HCI/BIS/BV-06-C HCI/BIS/BV-07-C
LL 9/33 AND HCI 3/8 AND HCI 14/12 AND HCI 20/1	Broadcast Isochronous Stream, Broadcaster	HCI/BIS/BI-07-C
LL 9/33 AND HCI 3/8 AND HCI 14/12 AND HCI 20/1 AND HCI 20/4	Broadcast Isochronous Stream, Broadcaster	HCI/BIS/BV-08-C
HCI 3/8 AND HCI 14/12 AND HCI 5/56 AND HCI 20/4	Sending HCI ISO Data Packets, CIS, Number of Completed Packets Event	HCI/CIS/BV-14-C
HCI 5/56 AND NOT LL 9/53 AND CORE 1a/60	LE Set CIG Parameters, Unsegmented Framed mode not supported	HCI/CIS/BI-18-C
HCI 20/1 AND LL 9/33 AND NOT LL 9/53 AND CORE 1a/60	LE Create BIG, Unsegmented Framed mode not supported	HCI/BIS/BI-10-C

Item	Feature	Test Case(s)
HCI 20/1 AND LL 12/2 AND LL 9/49 AND NOT LL 12/6	Broadcast Isochronous Stream not created from PAwR	HCI/BIS/BV-09-C
HCI 20/2 AND LL 12/2 AND LL 9/49 AND NOT LL 12/6	Broadcast Isochronous Stream not created from PAwR, Test Command	HCI/BIS/BV-10-C
LMP 2/12 AND LMP 2/15 AND HCI 9/1	Do Not Establish a SCO Connection When Retransmission is Specified	HCI/SCO/BV-01-C HCI/SCO/BV-02-C
LMP 2/12 AND LMP 2/15 AND HCI 9/10	Do Not Establish a SCO Connection When Retransmission is Specified – Enhanced Setup	HCI/SCO/BV-03-C HCI/SCO/BV-04-C
LMP 2/12 AND HCI 9/2	Accept SCO Connection	HCI/SCO/BV-09-C HCI/SCO/BV-10-C
LMP 2/12 AND HCI 9/11	Enhanced Accept SCO Connection	HCI/SCO/BV-11-C HCI/SCO/BV-12-C
LMP 2/12 AND LMP 6/11 AND HCI 9/1	SCO Connection creation fails when AES-CCM encryption is enabled – setup synchronous command	HCI/SCO/BV-13-C HCI/SCO/BV-14-C
LMP 2/12 AND LMP 6/11 AND HCI 9/10	SCO Connection creation fails when AES-CCM encryption is enabled – enhanced setup synchronous command	HCI/SCO/BV-15-C HCI/SCO/BV-16-C
HCI 16/37a AND NOT HCI 16/37c	Event version check, Encryption Change, BR/EDR, [v1] only	HCI/EVV/BV-01-C
HCI 16/37c	Event version check, Encryption Change, BR/EDR, [v1] and [v2]	HCI/EVV/BV-02-C
HCI 16/37b AND NOT HCI 16/37d AND LL 1/4	Event version check, Encryption Change, LE, [v1] only, Peripheral	HCI/EVV/BV-03-C
HCI 16/37d AND LL 1/4	Event version check, Encryption Change, LE, [v1] and [v2], Peripheral	HCI/EVV/BV-04-C
HCI 16/37b AND NOT HCI 16/37d AND LL 1/5	Event version check, Encryption Change, LE, [v1] only, Central	HCI/EVV/BV-05-C
HCI 16/37d AND LL 1/5	Event version check, Encryption Change, LE, [v1] and [v2], Central	HCI/EVV/BV-06-C
HCI 6/35 AND NOT HCI 6/35a	Event version check, LE Periodic Advertising Sync Established, [v1] only	HCI/EVV/BV-07-C
HCI 6/35a	Event version check, LE Periodic Advertising Sync Established, [v1] and [v2]	HCI/EVV/BV-08-C
HCI 6/33 AND NOT HCI 6/33a	Event version check, LE Periodic Advertising Report, [v1] only	HCI/EVV/BV-09-C
HCI 6/33a	Event version check, LE Periodic Advertising Report, [v1] and [v2]	HCI/EVV/BV-10-C
HCI 10/26 AND NOT HCI 10/26a	Event version check, LE Periodic Advertising Sync Transfer Received, [v1] only	HCI/EVV/BV-11-C

Item	Feature	Test Case(s)
HCI 10/26a	Event version check, LE Periodic Advertising Sync Transfer Received, [v1] and [v2]	HCI/EVV/BV-12-C
HCI 7/25 AND NOT HCI 7/38 AND NOT HCI 7/38a AND LL 1/5	Event version check, LE Connection Complete, Central	HCI/EVV/BV-13-C
HCI 7/38 AND NOT HCI 7/38a AND LL 1/5	Event version check, LE Enhanced Connection Complete, [v1], Central	HCI/EVV/BV-14-C
HCI 7/38a AND LL 1/5	Event version check, LE Enhanced Connection Complete, [v1] and [v2], Central	HCI/EVV/BV-15-C
HCI 7/25 AND NOT HCI 7/38 AND NOT HCI 7/38a AND LL 1/4 AND NOT LL 1/5	Event version check, LE Connection Complete, Peripheral	HCI/EVV/BV-16-C
HCI 7/38 AND NOT HCI 7/38a AND LL 1/4 AND NOT LL 1/5	Event version check, LE Enhanced Connection Complete, [v1], Peripheral	HCI/EVV/BV-17-C
HCI 7/38a AND LL 1/4 AND NOT LL 1/5	Event version check, LE Enhanced Connection Complete, [v1] and [v2], Peripheral	HCI/EVV/BV-18-C

Table 5.1: Test case mapping

6 Appendix MSC

6.1 Default settings

6.1.1 Authentication and encryption

This default setting will be used for the different authentication and encryption test cases.

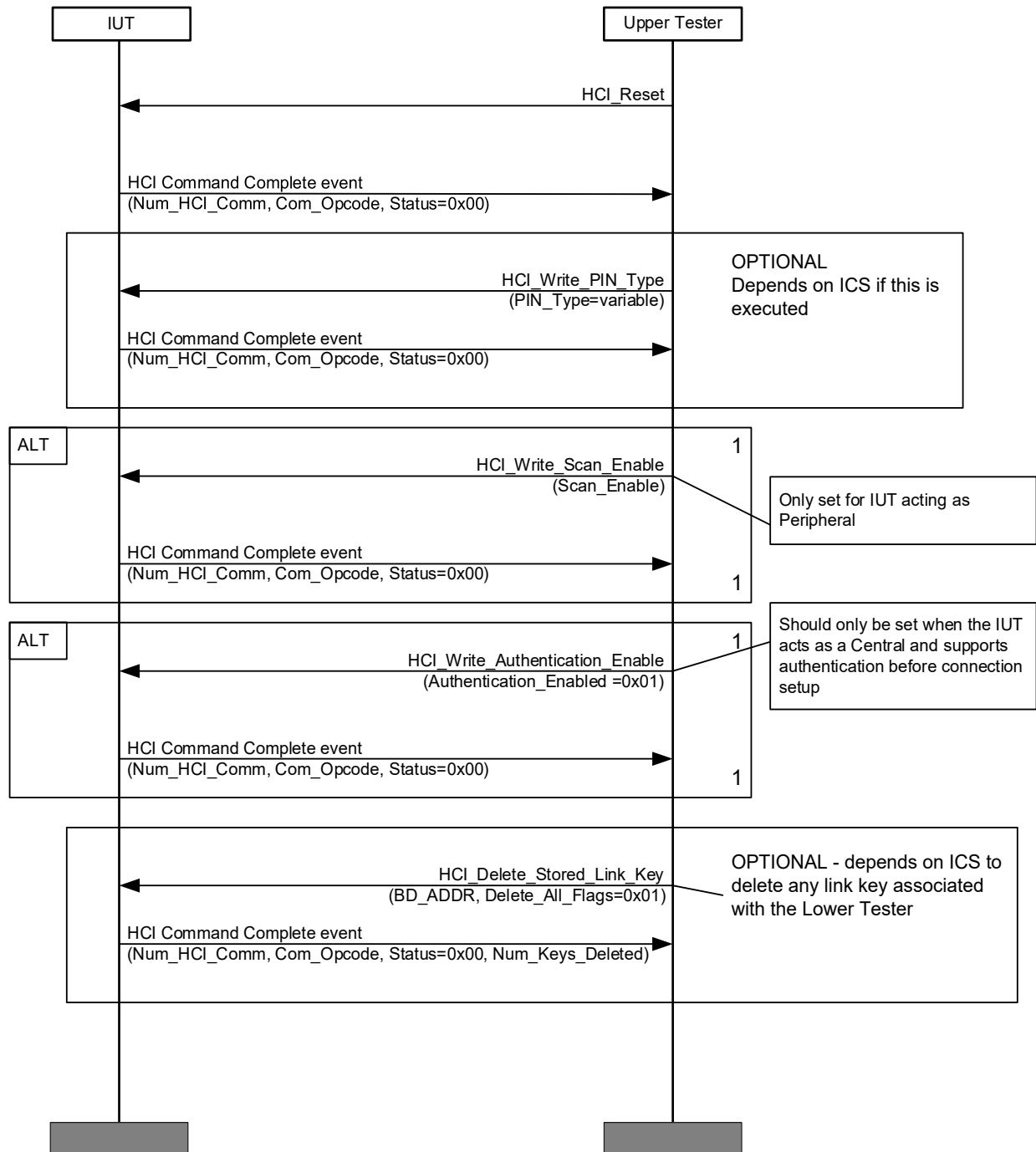


Figure 6.1: Authentication and encryption, default settings MSC

6.1.2 Device setup, Controller Flow Control, Controller Information, Device Discovery, and Host Flow Control

This default setting will be used for the Device setup, Controller Flow Control, Controller Information, Device Discovery, and Host Flow Control test cases.

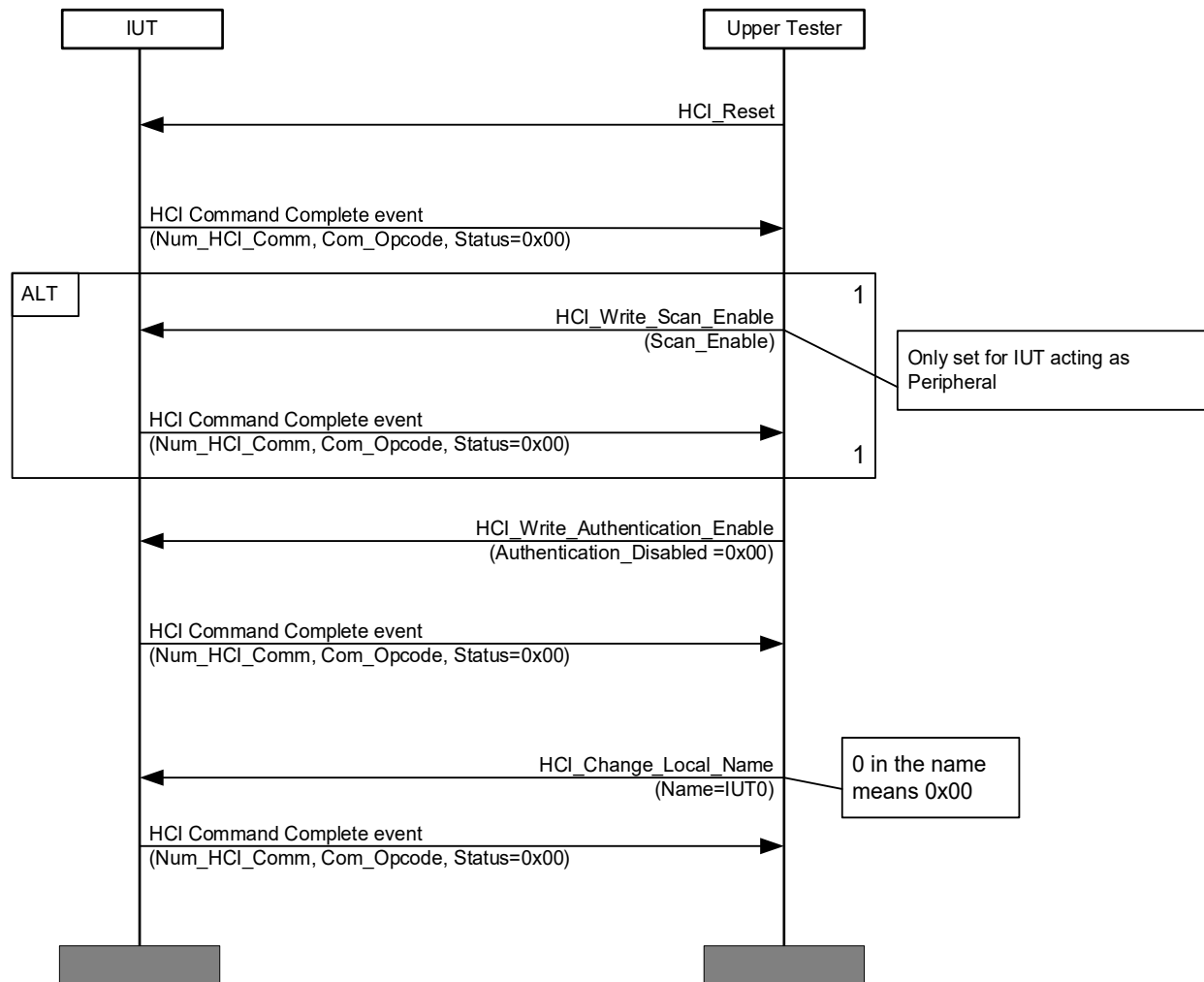


Figure 6.2: Device setup, Controller Flow Control, Controller Information, Device Discovery, and Host Flow Control, default settings MSC

6.2 Preambles

6.2.1 Connection Establishment IUT Central

This Preamble will be used when the IUT will act as Central.

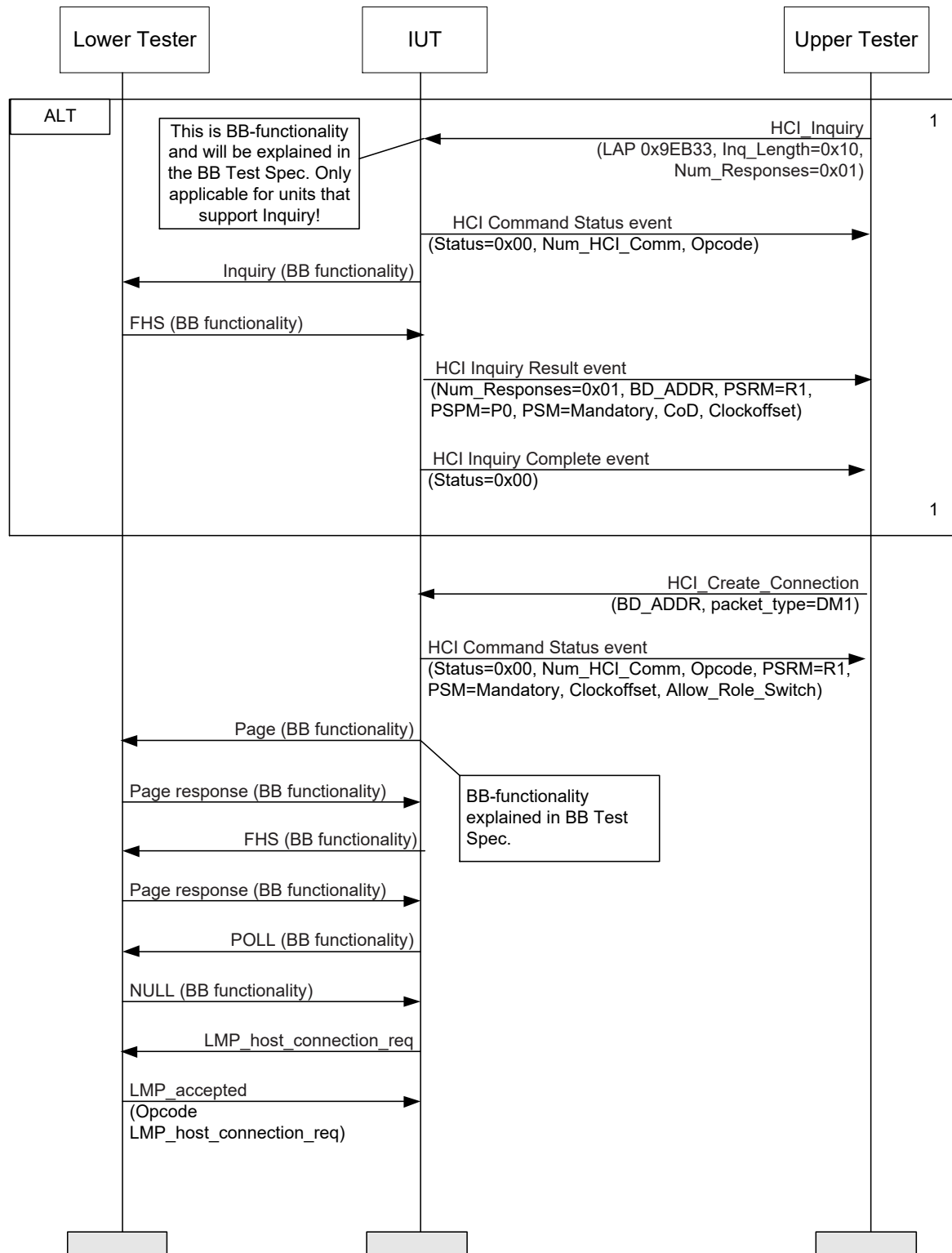


Figure 6.3: Connection Establishment IUT Central preamble MSC

6.2.2 Connection Establishment Lower Tester

This Preamble will be used in all cases when the IUT will act as a Peripheral.

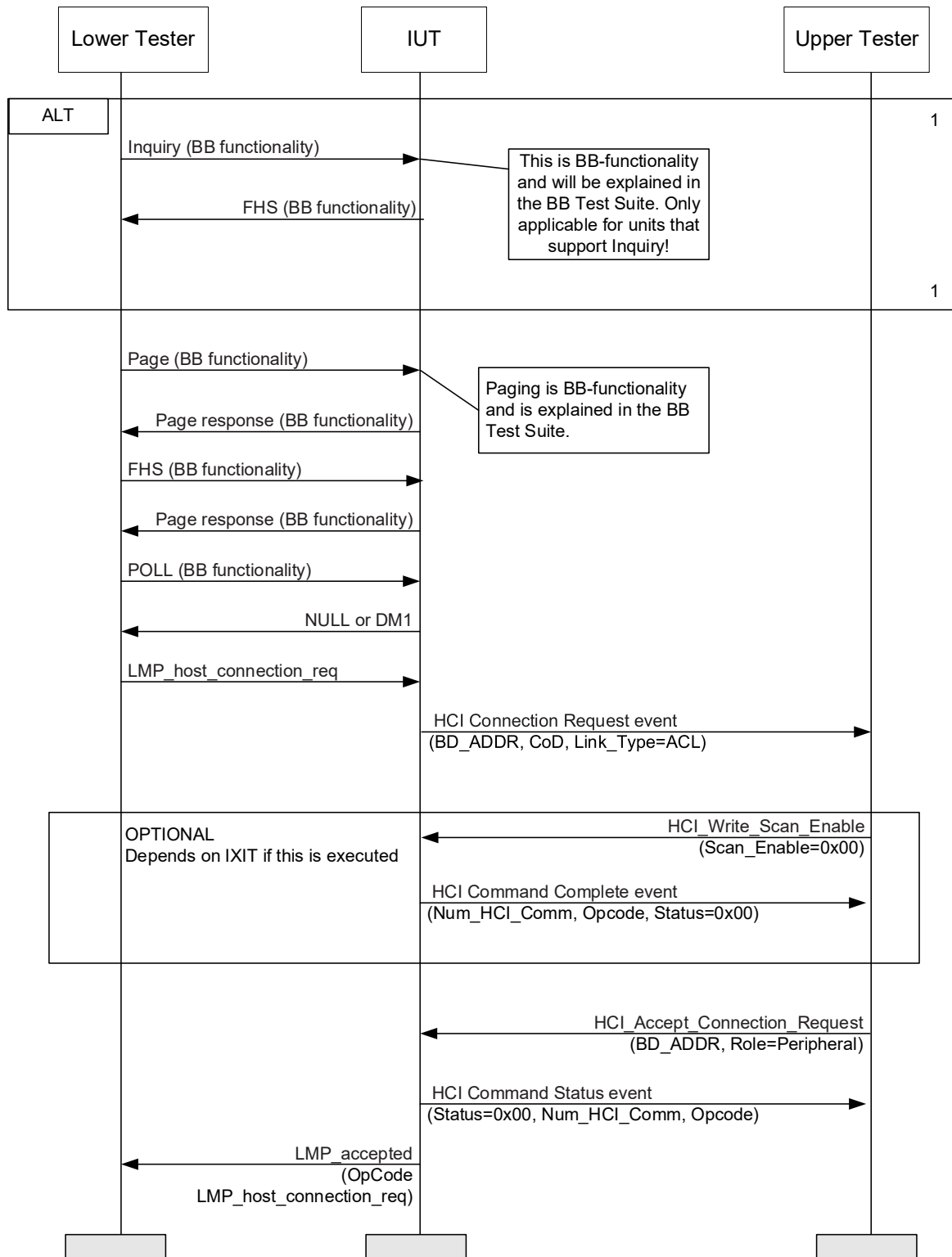


Figure 6.4: Connection Establishment Lower Tester preamble MSC

7 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
	2.0.E.1r2	2005-11-21	TSE 857 for TP/GEV/BV-01-C TSE 858: change to 5.7.1 and initial conditions in TP/CFC/BV-01-C, TP/DDI/BV-01-C, TP/DDI/BV-02-C, TP/HFC/BV-01-C, TP/HFC/BV-02-C TSE 860 for MSC 6.1.2 and 6.1.4: TSE 861 for TP/DSU/BV-01-C and TP/DDI/BV-01-C TSE 862 for Appendix MCS TSE 863 for TCMT row 1. TSE 866 for 4.1, 4.3.2.1, 4.3.2.2 TSE 867 for TCMT a) fonts, b) TP/CIN/BV-03-C ,c) LMP:TP/AUT/BV-04-C TSE 868 for TP/GEV/BV-01-C TSE 871: Add HCI 10/10 and HCI 10/11 to TCMT TSE 872: TCMT selection expressions for TP/DDI/BV-01-C, TP/DDI/BV-02-C, TP/AEN/BV-01-C
0	2.0.E.1	2005-12-07	Prepare for Publication.
	2.0.E.2r0	2006-04-04	TSE 881: TP/HFC/BV-01-C, TP/HFC/BV-02-C: update MFCs TSE 882: TP/AEN/BV-01-C; fix MSC, change pass/Fail Verdicts TSE 883: 6.1.1: change PIXIT to PICS TSE 884: Editorial updates except for searchable figure text
1	2.0.E.2	2006-06-19	Prepare for Publication.
	2.0.E.3r0	2006-10	TSE 1863: update MSC for TP/AEN/BV-01-C TSE 1905: TP/CFC/BV-01-C: Update Notes section Add TP/QOS/BV-01 –TP/QOS/BV-05 and TP/QOS/BI-01-C and updates to TCMT for Persistent Sniff Add TP/AEN/BV-02-C and TP/AEN/BV-03-C and updates to TCMT for EPR Add TCMT row for TP/PROT/ARQ/BV-37-C for Packet Boundary Flag
	2.1.E.0r0 through 2.1.E.0r2	2006-12-05 through 2006-12-28	Input reviewers' comments Renamed document from 2.0.E.3 to 2.1.E.1 Removed Sections 5.2.2, 5.3.1.1, 5.4.1.1, 5.5.1.1, 5.6.1.1, 5.7.1.1, 5.8.1.1, 5.9.1.1 Updated Note 1 with new selection expressions Add TCMT rows in Device Discovery and Authentication and Encryption sections for Simple Pairing Adjustments to TCMT due to ICS corrections Correction to document number from 2.1.E.1 to 2.1.E.0 Input reviewer's comments

Publication Number	Revision Number	Date	Comments
			TP/AEN/BV-02-C: remove "Applicable for all HCI devices;" assign unique name TP/AEN/BV-03-C: assign unique name Remove TP/QOS/BV-01 –TP/QOS/BV-05 and TP/QOS/BI-01-C and updates to TCMT for Persistent Sniff
2	2.1.E.0	2006-12-28	Prepare for Publication.
3	2.1.E.1	2007-09-06	TSE 2108: Update TCMT for TP/GEV/BV-01-C TSE 2218: Change TCMT for TP/AEN/BV-02-C, TP/AEN/BV-03-C; add new test TP/AEN/BV-04-C TSE 2124: Remove opcode values from opcode parameter in all MSCs
4	2.1.E.2	2008-04-29	TSE 2302: TP/GEV/BV-01-C: Change Pass verdict TSE 2404: TP/HFC/BV-02-C: update text TSE 2405: TP/AEN/BV-01-C : update MSC TSE 2450: TP/GEV/BV-01-C: TCMT change TSE 2451: TP/AUT/BV-03-C, TP/ENC/BV-05-C, TP/ENC/BV-07-C,TP/ENC/BV-10-C,TP/INF/BV-16-C, TP/LIH/BV-01-C,TP/LIH/BV-09-C,TP/LIH/BV-10-C, TP/LIH/BV-11-C,TP/LIH/BV-15-C,TP/LIH/BV-17-C, TP/LIH/BV-19-C,TP/LIH/BV-23-C,TP/LIH/BV-27-C, TP/LIH/BV-32-C,TP/LIH/BV-43-C,TP/LIH/BV-46-C, TP/LIH/BV-53-C,TP/LIH/BV-54-C,TP/LIH/BV-61-C, TP/LIH/BV-64-C,TP/LIH/BV-74-C,TP/AFH/BV-04-C, TP/PHYS/FRE/BV-03-C,TP/SP/BV-06-C,TP/SP/BV-08-C, TP/SP/BV-12-C,TP/SP/BV-14-C,TP/SP/BV-18-C, TP/SP/BV-20-C,TP/SP/BV-22-C,TP/SP/BV-24-C, TP/SP/BV-28-C,TP/PROT/ED/BV-01-C, TP/PROT/ED/BV-02-C,TP/PROT/ED/BV-03-C,TP/PROT/ED/BV-04-C
	2.1.E.3r0	2008-10-09 – 2008-11-11	TSE 2461: new test case. TCMT for LMP:TP/LIH/BV-04-C
5	2.1.E.3	2008-12-03	Prepare for Publication.
	2.1.E.4r0	2009-02-17	Add AMP HCI test cases
6	3.0.H.0	2009-04-07	Prepare for Publication.
7	3.0.H.1	2009-08-11	TSE 2680: update mappings to match updates to PICS TSE 2953: Add section headings for new test cases TSE 2954: TP/CSE/BV-02-C: edit Initial Condition TSE 2955: TP/CSE/BI-04-C: edit test purpose TSE 2992: TP/DDI/BV-01-C edit MSC; prepare for publications

Publication Number	Revision Number	Date	Comments
8	3.0.H2 through 4.0.0	2009-11-15	Transfer of material in LE_HCI_TS_0_9d7 to create a common HCI test spec with LE included Previous test cases reset test cases TP/CSC/BV-01-C .../BV-05-C renamed to TP/DSU/BV-02-C .../BV-06-C TP/CSC/BV-06-C renamed to TP/CFC/BV-03-C TP/CSC/BV-12-C renamed to TP/CIN/BV-05-C TP/CSC/BV-07-C renamed to TP/CIN/BV-06-C TP/CSC/BV-08-C & BV-09-C renamed to TP/CCO/BV-02-C & /BV-03-C TP/CSC/BV-11-C renamed to TP/HFC/BV-04-C TP/CSC/BV-13-C renamed to TP/CIN/BV-07-C TP/DDI/BV-01-C & BV-02 renamed to TP/DDI/BV-03 & /BV-04 TP/CCO/BV-02-C & TP/CCO/BV-03-C removed due to errata 3316 Correction: Additional TCs from the 6/10 3.0.H2r0 (TP/CCF/BV-01-C to BV-06-C added (TCs due to LMP enhancements) now as TP/CCO/BV-02-C to BV-07-C Remove TP/CFC/BV-02-C from TCMT. This test case does not show up in the TP&TSS section TMCT to TP/CFC/BV-03-C corrected Rename renamed TP/CFC/BV-03-C to TP/CFC/BV-02-C
	4.0.1r0	2010-06-11	Revised Revision History table TSE 3469: TP/DSU/BV-05-C: Update Initial Condition, MSC, test proc, verdict.
9	4.0.1	2010-06-24	Corrected MSC for DSU/BV-05
	4.0.2r0 through 4.0.2r6	2010-11-22 through 2011-03-22	TSE 3526: TP/GEV/BV-01-C, TP/GEV/BV-02-C: TMCT TSE 3916: TP/HFC/BV-04-C: Add 2nd reference to core spec TSE 3919: TP/DSU/BV-03-C, TP/DSU/BV-06-C update Fail verdict Made corrections to TSE 3916, 3919 per AT4Wireless review. Made further corrections to TSE 3916, 3919 per AT4Wireless review. TSE 4288: TP/CCO/BV-03-C, TP/CCO/BV-04-C: Update to TCMT TSE 3515: TCMT: Remove ref to LMP:TP/AUT/BV-04-C TSE 4084: TCMT update: TP/CSE/BV-01-C, TP/CSE/BV-02-C TSE 4301: TP/DSU/BV-01-C: update MSC, pass/Fail Verdicts. TSE 4303: TP/CCO/BV-02-C, TP/CCO/BV-03-C, TP/CCO/BV-05-C, TP/CCO/BV-06-C, TP/CCO/BV-07-C: update initial conditions

Publication Number	Revision Number	Date	Comments
			Per reviewer: TP/DSU/BV-01-C. Redrew MSC, adjusted revised text to be under correct Verdict headings. Per reviewer: TP/DSU/BV-01-C. MSC: changed 3 to 30, Fixed Pass/Fail verdict wording such that new text is IN ADDITION to original text, not instead of it.
10	4.0.2	2011-07-15	Prepare for Publication.
	4.0.3r0	2011-10-28	TSE 3368: TP/DSU/BV-01-C: Rename test case, remapping in TCMT TSE 4342: TP/CCO/BV-05-C: TCMT update TSE 4394: TP/CCO/BV-07-C, TP/CCO/BV-06-C: update TCMT TSE 4410: Update TCMT for test cases with master functionality TSE 4501: TP/DSU/BV-01-C: update MSC
	4.0.3r1	2012-02-15	TSE 3369 New test case TP/DSU/BV-07-C requires an update to the TCMT
11	4.0.3	2012-03-30	Prepare for Publication.
	4.0.4r0	2012-05-17	TSE 4583: TP/HFC/BV-03-C: Change mask in MSC TSE 4729: TP/PROT/ED/BV-04-C: removed duplicate entry in TCMT Editorial: removed TC descriptions in TCMT
12	4.0.4	2012-07-24	Prepare for Publication.
	4.0.5r1	2012-10-02	TSE 4881: Mapping revised for LMP test case TP/SP/BV-12-C based on released LMP TSE 4228. TSE 4956: Removed test cases in the TCMT that require the support optional 802.11PAL features that are not defined in the HCI core specification and therefore should not be included in the HCI testing scope.
13	4.0.5	2012-11-15	Prepare for Publication.
	4.0.6r1	2012-11-19	Connectionless Broadcast Change Request
	4.0.6r2	2013-01-02	Connectionless Broadcast Review: Deleted "Truncated Paging" from Figure 4.1. Edited 4.3.1.17 Moved Verify Truncated Paging to section 5.10 and it is TP/CSE/BV-06-C, made Response Timeout Detection TP/CSB/BV-06-C. Changed title of 5.10 from "Controller Setup" to "Connection Setup"
	4.0.6r3	2013-01-03	Connectionless Broadcast Review (Mayank) Editorial changes Moved "Page Response Timeout" test case to section 5.10, it is now TP/CSE/BV-07-C.

Publication Number	Revision Number	Date	Comments
	4.0.6r4	2013-01-07	Connectionless Broadcast Review (Alicia) Editorial changes to TCMT to reflect test case name changes.
	4.0.6r5	2013-01-24	Connectionless Broadcast Review (Jason, Alicia, and Meagan) Updated Conformance section Revised feature descriptions in the TCMT for TP/CSB/BV-01-C and TP/CSB/BV-04-C.
	4.0.6r6	2013-01-28	Approved by BTI
14	4.0.6	2013-02-19	Prepare for Publication
	4.0.7r1	2013-05-13	TSE 5084: TCMT Clean Up and Updates.
	4.0.7r2	2013-06-11	BTI Review, Magnus, TP/SEC/SCN/BV-01-C TCMT mapping updated incorrectly, Fixed.
	4.0.7r3	2013-06-13	BTI review, Alicia's comments
	4.0.7r4	2013-06-16	BTI review, Saravanun's comments
	4.0.7r5	2013-06-17	BTI review, fixes
15	4.0.7	2013-07-02	Prepare for Publication
	4.0.8rT	2012-07-02	Template Conversion: - Update of language to match BTI approved wording (example, Fail Verdicts) - Removal of Test Subgroup Objectives - Removal of sections marked "N/A"
	4.0.8rTr3	2013-09-23	Template Review Comment Resolution
	4.1.0r01	2013-09-23	BR/EDR Secure Connections CR
	4.1.0r02	2013-09-25	Train Nudging and Generalized Interlaced Scan CR
	4.1.0r03	2013-09-27	TSE 5268: Clarification of TP/AEN/BV-01-C by adding a note. Updated name of TP/AEN/BV-04-C and preamble and MSC. Updates description in TCMT for TP/AEN/BV-01-C and TP/AEN/BV-04-C rows.
	4.1.0r04	2013-10-09	Piconet Clock Adjust CR
	4.1.0r05	2013-10-10	LE Ping CR
	4.1.0r06	2013-10-17	LE Link Layer Topology CR
	4.1.0r08	2013-10-26	Correction to TCMT based on review of HCI ICS
16	4.1.0	2013-12-03	Prepare for Publication
	4.1.1r00	2013-04-07	TSE 5491: Updated Test Procedure, MSC and Pass verdict for TP/CFC/BV-02-C. TSE 5574: Updated TCMT entry for TP/HFC/BV-04-C.
	4.1.1r01	2014-06-16	BTI Review by Xuguang: Updated Figure 4.11 in TP/CFC/BV-03-C to read "HCI_LE_Data_Packet" instead of "HCI_Data_Packet."
17	4.1.1	2014-07-07	TCRL 2014-1 Publication
	4.1.2r00	2014-10-20	TSE 5918: Correction in Test Description and MSCs for TP/CCO/BV-03-C, TP/CCO/BV-04-C

Publication Number	Revision Number	Date	Comments
	4.1.2r01	2014-11-05	BTI Review, Dave, revised the test descriptions of TP/CCO/BV-03-C and TP/CCO/BV-04-C to align with the language update in TSE 5918.
	4.2.0r00	2014-11-07	Integrated changes from Section 4 of Core_LE_Data_Length_Extensions_TEST.CRr01_clean
	4.2.0r01	2014-11-24	Rasmus reviewed; added Privacy 1.2 commands & Minor editorial fixes
	4.2.0r02	2014-11-25	Mayank reviewed. Updated naming from "Read/Write Default..." to "LE Read/Write Suggested Default..." Other editorial fixes
18	4.2.0	2014-12-04	Prepare for TCRL 2014-2 publication
	4.2.1r00	2015-05-05	TSE 6367: Corrected TP numbering for TP/DSU/BV-04-C TSE 6152: Corrected TCMT mapping for TP/AEN/BV-06-C and TP/AEN/BV-07-C
	4.2.1r01	2015-05-16	Review by Magnus; corrected TSE 6152 by adding HCI 16/53
19	4.2.1	2015-07-14	Prepared for TCRL 2015-1 publication
	4.2.2r00	2015-10-07	TSE 6564: Corrected TCMT mapping for TP/CSB/BV-03-C. TSE 6703: Corrected mapping for TP/CM/BV-01-C and TP/CM/BV-02-C
20	4.2.2	2015-12-22	Prepared for TCRL 2015-2 publication
	4.2.3r00	2015-01-11	TSE 6817: Corrected typo in first message of MSC for TP/HFC/BV-02-C.
	4.2.3r01	2015-01-18	TSE 6850: Corrected first message of MSCs for TP/CCO/BV-10-C and TP/CCO/BV-11-C.
	4.2.3r02	2016-02-04	TSE 6791: Last event from IUT: Channel Map changed from "0x00000000FFFFFFFFFFFF" to "0x00000000FFFFEFFFFFFF" in MSC of test case TP/CSB/BV-03-C
	4.2.3r03	2016-02-15	TSE 6718: Initial condition changed to "IUT is in standby" for test cases TP/CCO/BV-12-C – ...14-C. TSE 6909: Editorial edit. TCMT Updates: Deleted "AND HCI 2/1" from Item column for test cases TP/DSU/BV-01-C – ...07-C. Moved test case TP/DSU/BV-07-C to end of Device Setup section.

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	4.2.3r04	2016-03-03	TSE 6756: Changed Initial Condition to "No LL connection exists" for test cases TP/CIN/BV-01-C – 04-C, TP/AEN/BV-01-C, and TP/AEN/BV-04-C. Deleted test cases TP/CIN/BV-05-C and TP/CIN/BV-07-C. TCMT Updates: Deleted mapping for TP/CIN/BV-05-C and TP/CIN/BV-07-C, as they are duplicates of 03-C and 04-C (visible with all markup showing). Consolidated mapping to HCI 4/1 and HCI 4/2. TSE 6783: Updated Test Procedure, MSC, and Pass Verdict for TP CCO/BV-05-C and CCO/BV-07-C and accept HCI_Command_Complete event or HCI_Command_Status event with Status = Unknown HCI Command. TSE 6808: Added four new Sections 4.7.5–8, test cases TP/HFC/BV-05-C – 08-C. All four new MSCs redrawn and captioned. In TCMT, added four new test cases to Host Flow Control, second item. TSE 6908: Updated test case TP/GEV/BV-01-C (entire section). Deleted test case TP/GEV/BV-02-C. TCMT: Updated Item and Feature for test case TP/GEV/BV-01-C and deleted mapping for test case TP/GEV/BV-02-C. TSE 6949: In TCMT, updated second Item under Host Flow Control for test case TP/HFC/BV-02-C.
	4.2.3r05	2016-04-06	TSE 6763: Test case TP/AEN/BV-05-C updated (multiple reads are not identical). Expanded title of test case TP/AEN/BV-05-C. MSC updated and figure caption added. Pass verdict updated. TSE 6940: Deleted test case and TCMT mapping for TP/CCO/BV-06-C.
21	4.2.3	2016-07-13	Prepared for TCRL 2016-1 publication
	5.0.0r00	2016-07-07	Integrated changes for Core Specification 5.0 release
	5.0.0r01	2016-09-12	Issue 7626: Added new reference to the Core Specification Version 5.0 or later. Updated cross-references for test cases TP/DDI/BI-01-C & 02-C, TP/CCO/BV-15-C – 20-C, and TP/CM/BV-03-C.
	5.0.0r02	2016-09-30	Issue 7728: Deleted reference to test case TP/FRH/SLA/BV-03-C in TCMT.
	5.0.0r03	2016-10-07	TSE 7581 (erratum 7021): Change LE Set Advertise Enable to LE Set Advertising Enable. TSE 7665: Clarify mapping of feature bits and ICS entries in TP/CIN/BV-01-C and 02-C. TSE 7574 (erratum 7017): Added optional LE_Data_Length_Change event to test TP/CCO/BV-09-C [LE Set Data Length] and replaced MSC accordingly. TSE 7252: Added new reference for SUM ICS. Updated Initial Condition for test cases TP/CCO/BV-03-C and TP/CCO/BV-04-C.

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	5.0.0r04	2016-11-10	Issue 8046: Updated initial condition for TP/CCO/BV-16-C through TP/CCO/BV-20-C ("LE Read Periodic Advertiser List Size Command, LE Add/Remove/Clear Periodic Advertiser List Commands, LE Read Transmit Power Command, LE Write RF Path Compensation Command, and LE Read RF Path Compensation Command): IUT initially is in standby. Issue 8049: Replaced figures for TP/CCO/BV-16-C [LE Read Periodic Advertiser List Size Command] (Figure 4.49) and TP/CCO/BV-17-C [LE Add/Remove/Clear Periodic Advertiser List Commands] (Figure 4.50) to fix typo in command name ("HCI_LE_Add_Device_To_Period_Advertiser_List" becomes "HCI_LE_Add_Device_To_Periodic_Advertiser_List"). Issue 8038: Updated Generic Events description to cover mixed legacy and extended advertising commands; added new Generic Events test case, TP/GEV/BV-02-C; added the new test case to Test Case Mapping Table.
22	5.0.0	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	5.0.1r00	2017-03-06	TSE 7685: In test case HCI/CSB/BV-04-C, changed figure caption from "TP/CSB/BV-01-C" to "HCI/CSB/BV-04-C". TSE 7800: Updated test case HCI/HFC/BV-07-C: Changed "disable" to "disabled" in introduction. Updated Pass Verdict. Updated MSC: Deleted ALT1 procedure. Removed "ALT2" label. TSE 8301: Updated TCMT and mapping for LL: LL/CON/ADV/BV-05-C and LL: LL/CON/INI/BV-13-C.
	5.0.1r01	2017-04-10	TSE 8667: Updated test case HCI/DDI/BI-01-C: Corrected spelling error "AFdvertising" to "Advertising". Updated pass verdict. Updated MSC (Figure 4.21: HCI/DDI/BI-01-C) to include changes that were made to the pass verdict.
	5.0.1r02	2017-04-27	TSE 8915: Clarifications made to HCI/DDI/BI-01-C from TSE 8667 by correcting typos ("internal" to "interval" in initial condition, test procedure, and MSC), changed "Adv" to "Advertising in pass verdict and updated value in MSC ("0x03" to "0x30"). Updated pass verdict and corrected typos ("internal" to "interval") in test procedure for HCI/DDI/BI-02-C. TSE 8821: Updated mapping in TCMT for LL: LL/DDI/SCN/BV-13-C.
	5.0.1r03	2017-05-16	TSE 7858: Updated MSC in HCI/CM/BV-02-C: Changed last message parameter from "Peer_Resolvable_Address" to Local_Resolvable_Address".
	5.0.1r04	2017-05-10	Converted to new Test Case ID conventions as defined in TSTO v4.1.

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23	5.0.1	2017-07-05	Approved by BTI. Prepared for TCRL 2017-1 publication.
	5.0.2r00	2017-08-17	TSE 9164: For HCI/HFC/BV-04-C in Figure 4.25, changed "Even_Mask=0x20008000000018890" to "Event_Mask={bits 4, 7, 11, 15, 16, 43, 61}" and changed "Event_Mask=0x000000000000001D" to "Event_Mask={bits 0, 2, 3, 4}." TSE 9380: For HCI/AEN/BV-01-C Link Key Commands figure, removed Com_Opcode values. For HCI/AEN/BV-06-C Public Keys figure, removed Comm and Opcode values and TBD; changed "P256" to "P-256". For HCI/AEN/BV-07-C Generate D H Keys figure, removed Comm values and "Opcode=TBD"; changed "P256" to "P-256". For HCI/CSE/BV-01-C Logical Link Cancel Command and HCI/CSE/BV-02-C Logical Link Cancel Command figures, removed Comm and Opcode values.
	5.0.2r01	2017-08-23	TSE 9681: For HCI/AEN/BV-05-C, revised Initial Condition text and Figure 4.34.
	5.0.2r02	2017-09-14	TSE 9775: Revised text and replaced figure in test case HCI/GEV/BV-02-C and revise TCMT. Added new test case HCI/GEV/BV-03-C and added it to the TCMT.
	5.0.2r03	2017-09-19	AoA/AoD: Integrated new test cases from the AoA/AoD CR into the TCMT.
	5.0.2r04	2017-09-29	TSE 9830: Changed the feature name from "LE Read Remote Used Features" to "LE Read Remote Features" for LL/CON/SLA/BV-11-C, LL/CON/SLA/BI-06-C, and LL/CON/SLA/BV-23-C in the TCMT.
	5.0.2r05	2017-10-12	TSE 9747: Remapped the TCMT for LL test cases for LE Data Length Change Event features according to LL TSE 9729.
	5.0.2r06	2017-10-13	TSE 9931: Added new test case HCI/GEV/BV-04-C to the "Generic Events" section and TCMT.
	5.0.2r07	2017-10-16	TSE 9900: Updated the Event_Mask values in MSCs HCI/HFC/BV-01-C, HCI/HFC/BV-03-C, and HCI/HFC/BV-04-C. Added a second pass verdict to Expected Outcome for HCI/HFC/BV-03-C.
24	5.0.2	2017-12-07	Approved by BTI. Prepared for TCRL 2017-2 publication.
	5.0.3r00-05	2018-02-21 – 2018-06-15	TSE 10227 (rating 1): Editorial fix to MSC for HCI/CM/BV-01-C & 02-C: Replaced "Own_Address_Type=0x00" in the 'IUT is Slave' alternative with "Own_Address_Type=0x02" TSE 10282 (rating 3): Added note to HCI/CCO/BV-04-C MSC about LMP features ext req being "optional if..." in the event that local features have not changed.

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			TSE 10467 (rating 2): Revised Section 5.1 (Test Case Mapping). Revised TCMT: deleted "Test Case Applicable" column; changed LMP/ENC/BV-45-C to 48-C; revised items for LMP/ENC/BV-27-C, 31-C, 25-C, 48-C, LMP/AUT/BV-03-C, 04-C, 06-C, LMP/SP/BV-64-C, 65-C. TSE 10494 (rating 3): Added "Command Status" to the Test Purpose, Test Procedure Steps 3 and 6, MSC, and Pass Verdict for test case HCI/GEV/BV-03-C. Added new column "Associated Event" to Test Procedure tables in Steps 3 and 6. TSE 10494 (rating 3): Revised LE Periodic Advertising Create Sync Cancel command's associated event from HCI_Command_Status event to HCI_Command_Complete event in Table 4.4 of the test procedure for test case HCI/GEV/BV-03-C. Incorporated Core E10734 Pairing Updates TS CR: Added new test cases HCI/CIN/BV-08, 09-C, and HCI/AEN/BI-01-C and added them to the TCMT.
25	5.0.3	2018-07-02	Approved by BTI. Prepared for TCRL 2018-1 publication.
	5.0.4r00-r10	2018-07-19 – 2018-11-13	Incorporated Core_PAST_CLE_TEST_CR_r05: Added 2 rows to Table 4.2. Added new test case HCI/DDI/BI-03-C. Added to TCMT: HCI/DDI/BI-03-C, LL/CON/SLA/BV-103-C, and LL/CON/MAS/BV-99-C. Incorporated Core Minor Enhancements Batch 1 Test CRr10-clean: Added 1 new test case to spec text and TCMT: HCI/AEN/BV-08-C. Added 5 new test cases to TCMT: LL/DDI/ADV/BI-03-C – 04-C; LL/DDI/ADV/BV-40-C – 42-C. Issue 10716: Added 6 new test cases to spec text and TCMT: HCI/CCO/BV-21-C – 26-C. Issue 10826: Added 2 new test cases to TCMT: LL/DDI/ADV/BI-05-C – 06-C. Issue 11122: Deleted LE Random Address test cases from MEP 17: HCI/CCO/BV-21-C – 26C and removed mapping. Removed mapping for deleted LL test cases DDI/ADV/BI-03-C, BI-04-C, BV-40-C through 42-C. TSE 10621 (rating 3): Updated test purpose, test procedure, and pass verdict for test case HCI/GEV/BV-04-C. TSE 10717 (rating 2): Updated MSC for test case HCI/CCO/BV-05-C. In TCMT, updated mapping for test cases HCI/CCO/BV-05-C and 07-C. TSE 10718 (rating 3): Updated MSC for test case HCI/DSU/BV-01-C. TSE 10723 (rating 2): In TCMT, deleted duplicate test case LL/DDI/SCN/BV-15-C, and updated mapping for test cases LL/DDI/SCN/BV-13-C to 17-C. TSE 10724 (rating 1): In TCMT, deleted duplicate test case LL/SEC/ADV/BV-02-C, and updated mapping for test cases LL/SEC/ADV/BV-02-C and 03-C.

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			TSE 10840 (rating 4): Updated test purpose, initial condition, test procedure, MSCs, and pass verdict for test case HCI/HFC/BV-08-C. TSE 11002 (rating 1): Updated MSC caption for test case HCI/CIN/BV-08-C. TSE 11003 (rating 1): Updated MSC caption for test case HCI/CIN/BV-09-C. TSE 10838 (rating 4): Updated initial condition, MSC, and pass verdict for test case HCI/CCO/BV-10-C. Updated test procedure, MSC, and pass verdict for test case HCI/CCO/BV-11-C. TSE 10576 (rating 3): Deleted top MSC for test case HCI/HFC/BV-04-C. TSE 10722 (rating 1): In TCMT, deleted test case LL: LL/CON/SLA/BI-06-C and changed LL: LL/CON/SLA/BV-11-C to LL: LL/CON/SLA/BV-22-C. TSE 11157 (rating 4): Added new reference to Erratum 10831. Added new test case HCI/CM/BV-04-C and added it to the TCMT. TSE 10842 rejected by BTI. Removed changes made by TSE 10842. TSE 11002 (rating 1): Minor Modification: changed Figure 4.18 title from "HCI/CIN/BV-07-C" to "HCI/CIN/BV-08-C". Replaced [X] values with actual values. Changed Madrid grey text to black text.
	5.1.0r00-r01	2018-11-13 – 2018-11-29	Updated revision number from 5.0.4 to 5.1.0 to align with the adoption of Core Specification version 5.1 TSE 11269 LMP/ENC/BV-27-C, ../BV-31-C and ../BV-25-C removed from TCMT
26	5.1.0	2018-12-07	Approved by BTI. Prepared for TCRL 2018-2 publication.
	5.1.1r00-r13	2019-03-29 – 2019-06-21	TSE 11646 (rating 1): Updated TCMT Item to HCI 7/38 and HCI 7/41 for test case HCI/CM/BV-04-C. TSE 11489 (rating 3): Updated Pass Verdict for test cases HCI/CCO/BV-02-C and -03-C. TSE 11436 (rating 3): Replaced MSC for test case HCI/DSU/BV-01-C with new one. TSE 11488 (rating 4): Deleted test case HCI/CCO/BV-04-C and updated TCMT accordingly. TSE 11475 (rating 3): Updated pass verdict for test case HCI/DDI/BV-04-C. TSE 11200 (rating 1): Added a Notation Conventions section to describe editorial conventions. TSE 11197 (rating 4): Updated text and MSCs in test cases HCI/CM/BV-01-C and -02-C. Added test cases HCI/CM/BV-05-C and -06-C and updated TCMT accordingly. TSE 10726 (rating 2): Updated TCMT to address mapping issues.

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			TSE 11171 (rating 4): Added new section for “Resolving List Commands fail when list in use” and related test cases HCI/CCO/BI-01-C – -05-C. TSE 11168 (rating 4): Added new test case HCI/DDI/BI-04-C (and updated TCMT accordingly). Updated MSC, Pass Verdict, and Test Procedure Steps 2 and 5 and added Steps 7–10 for test case HCI/CCO/BV-17-C. TSE 11163 (rating 4): Added test cases HCI/DDI/BI-05-C and HCI/CM/BI-01-C and updated TCMT accordingly. TSE 11209 (rating 4): Updated test case name for test case HCI/HFC/BV-05-C; added new test cases HCI/HFC/BV-09-C – -13-C. Updated TCMT accordingly. TSE 11869 (rating 1): Updated TCMT to address a mapping issue with test case HCI/AEN/BI-01-C. TSE 11194 (rating 4): Added new section “Reject Invalid Enable Command” with test cases HCI/DDI/BI-06-C – -11-C and new test cases HCI/DDI/BI-12-C [Reject Invalid Extended Advertising Enable Command] and HCI/DDI/BI-13-C [Reject Invalid Periodic Advertising Enable Command] and updated TCMT accordingly. TSE 11952 (rating 1): Fixed a typo in Step 5 of test case HCI/CM/BV-04-C. TSE 11900 (rating 2): Updated Step 3 of test case HCI/GEV/BV-02-C and added a “Command Complete Event” column to the Step 3 table. Updated to incorporate BTI review feedback, adding test cases HCI/CCO/BV-10-C and HCI/CCO/BV-11-C back into the TCMT and updating template.
27	5.1.1	2019-08-01	Approved by BTI. Prepared for TCRL 2019-1 publication.
	p28r00–r09	2019-08-06 – 2019-12-03	Added test groups to accommodate adoption of Core Specification v5.2 with regard to Isochronous Channels CR r20 (includes Issues 11742, 11762, 11777, 11778, 11779, 11783, 11786, 11804, 11817, 11819, 11820, 11852, 11917, 11919, 11928, 11929, 11930, 11983, 11740, 11801, 11941, 12029, 12030, 12043, 12052, 12053, 12054, 12055, 12059, 12061, 12071, 12072, 12073, 12077, 12084, 12031, 12078, 12094, 12095, 12106, 12107, 12130, 12132, 12133, 12251, 12280, and 12321). Added section for new test case HCI/CM/BV-07-C and updated TCMT accordingly; updated references section with new Core Specification.

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			Added test groups to accommodate adoption of Core Specification v5.2 with regard to LE Power Control CR r07 (includes Issues 12116, 12112, 12115, 12117, 12118, 12255). Added “LE Power Control” items to Test Strategy and Test Groups sections. Updated Test Case Identification Conventions table with “LE Power Control” item. Added new LE Power Control section (4.13), including test case HCI/PCL/BV-01-C. Updated TCMT accordingly. Updated per Issue 12335 (CR file in comment 49736). Added “Invalid LE Power Control HCI Parameters” section, which includes new test cases HCI/CCO/BI-06-C – -12-C. Updated TCMT accordingly. Updated per Issue 12343 (CR file in comment 49068). Added test case HCI/CCO/BI-13-C [Invalid Path Loss Monitoring Parameters] and updated TCMT accordingly. TSE 12257 (rating 3): Updated MSC and pass verdict for test case HCI/DDI/BI-03-C to fix an error code that was wrong. TSE 12110 (rating 1): Fixed references to align with changes made in erratum 11876. TSE 12703 (rating 4): Added new section “Validate Unsupported Packet Types are Not Accepted”, featuring test cases HCI/CCO/BI-14-C – -17-C and updated TCMT accordingly. TSE 12779 (rating 2): Updated test case mapping for HCI/AEN/BI-01-C to remove mapping to SUM ICS 21/17 (Erratum 10734). TSE 12518 (rating 2): Updated initial condition for test case HCI/DDI/BI-13-C to better reflect Core Spec requirements. Issue 12488 (CR from comment 52050): Added CIS and BIS to the HCI TC Feature Naming Conventions list; added Isochronous Streams test case section for CIS test cases, featuring test cases HCI/CIS/BV-01-C – -04-C. Updated TCMT accordingly. Issue 12489 (CR from comment 51975): In “Test Suite Structure” section, added Isochronous Streams item to command list and related items to the Test Suite Structure figure and fixed level of LE Power item in figure; added Isochronous Streams paragraph to Test Groups section. Added related Isochronous Streams test case section for BIS test cases, featuring test cases HCI/BIS/BV-01-C and -02-C. Updated TCMT accordingly. TSE 12925 (rating 1): Globally fixed “Lower/Upper Tester expects” types of wording to “Lower/Upper Tester receives” types of wording where appropriate. Integration review feedback from Cloud2GND: Resolved .X and Milan references with real numbers. Updated test purpose and initial condition for test case HCI/CCO/BI-13-C.

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			Integration review feedback. Updated test cases HCI/CCO/BI-08-C and HCI/CCO/BI-09-C to fix copy/paste error with reason/status wording/numbers. Revised document numbering convention, setting last release publication of 5.1.1 as p27; added publication number column to Revision History. Updated Contributors list.
28	p28	2020-01-07	Approved by BTI on 2019-12-22. Prepared for TCRL 2019-2 publication.
	p29r00–r42	2020-01-24 – 2021-06-21	TSE 10672 (rating 4): To address the need for SCO/eSCO tests, updated the Test Strategy and Test Groups sections, added an item to the TCID Conventions table, and added an entire new section (and relevant subsections), including new test cases HCI/SCO/BV-01-C – -08-C. Updated TCMT accordingly. TSE 11969 (rating 1): Fixed mislabeled references in sections containing test cases HCI/CFC/BV-02-C, HCI/CIN/BV-06-C, HCI/DDI/BV-03-C and -04-C, HCI/HFC/BV-04-C, HCI/CCO/BV-10-C – -15-C, and HCI/CM/BV-01-C and -02-C (current section numbering 4.4.2, 4.5.5, 4.6.3, 4.6.4, 4.7.4, 4.9.8–.13, 4.12.1–.2). Removed previous [10] (Summary of Selected Specifications in Implementation (SUM ICS)) from the references list. TSE 12571 (rating 3): Updated the pass verdict for test case HCI/DDI/BI-05-C to address HCI command parameters that are out of range. TSE 12700 (rating 4): To address Erratum 11205, created new BI tests to test the error conditions for LE Set Extended Advertising Parameters, LE Set Periodic Advertising Parameters, and LE Set Periodic Advertising Enable commands. Fixed typo in TC HCI/DDI/BI-04-C and added three new DDI sections, including new TCs HCI/DDI/BI-15-C – -47-C. Updated TCMT accordingly. TSE 12757 (rating 4): Added “Error Response for Unsupported Commands on Transports” section (including new test cases HCI/CCO/BI-18-C – -32-C) so that HCI commands for unsupported transports return errors. Updated TCMT accordingly. TSE 12759 (rating 4): Added an invalid parameter test case for the LE Set Data Length command, new TC HCI/CCO/BI-40-C. Updated TCMT accordingly. TSE 12808 (rating 3): Per Spec Issue 12373, added new tests for Command_Disallowed, LE Read ISO TX Sync command, new TCs HCI/CIS/BI-03-C and -04-C. Updated TCMT accordingly. TSE 12809 (rating 4): Per Spec Issue 12474, added a new test to address new shall requirements to the Set CIG Parameters commands to add or modify a CIS in a CIG, new TC HCI/CIS/BV-05-C. Updated TCMT accordingly.

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			TSE 12838 (rating 4): To address Erratum 12784, added Codec In Controller tests, new TCs HCI/CIN/BV-10-C and -11-C, HCI/CCO/BI-42-C. Updated TCMT accordingly. TSE 12844 (rating 1): Corrected parameter value for test case HCI/DDI/BI-01-C. TSE 12882 (rating 1): Added a Notes section to test cases HCI/AEN/BV-06-C and -07-C and HCI/AEN/BI-01-C to address an HCI_LE_Read_Local_P-256_Public_Key_Complete parameter change. TSE 12954 (rating 2): Updated MSC and pass verdict for test case HCI/DDI/BI-01-C and pass verdict for test case HCI/DDI/BI-02-C. TSE 13015 (rating 4): To address an issue with needing additional ISOC error codes: modified Test Purpose, Initial Condition, TC descriptions, MSCs, test steps, and Pass Verdict for section containing TCs HCI/CIS/BV-01-C – -04-C; added new TCs HCI/CIS/BI-08-C and -09-C; modified Reference, MSCs, test steps, and Pass Verdict for section containing TCs HCI/BIS/BV-01-C and -02-C; added new TC HCI/BIS/BI-02-C; updated TCMT accordingly. TSE 13064 (rating 4): Updated the initial condition, MSC, and pass verdict for test case HCI/CIN/BV-02-C to better define the requested page. TSE 13080 (rating 2): Updated initial condition and test procedure for test case HCI/DDI/BI-13-C to conform to specification. TSE 13121 (rating 4): To address issue with test written only for BR/EDR but mapped to all transports, modified section containing TC HCI/CFC/BV-01-C by moving that TC to a TC Config table and adding new TC HCI/CFC/BV-03-C, and updating test procedure steps and MSC; updated test purpose, reference, test procedure, MSC, and pass verdict and added a Notes section to TC HCI/CFC/BV-02-C; added new TCs HCI/CFC/BV-04-C and -05-C. Updated TCMT accordingly. TSE 13165 (rating 2): Corrected TCMT problems. TSE 13352 (rating 1): Replaced MSC for test cases: HCI/CPB/BV-01-C, HCI/CPB/BV-03-C, HCI/CPB/BV-04-C, HCI/CPB/BV-05-C, and HCI/PCL/BV-01-C to address changes required for Erratum 13293. Editorials to address Erratum 13293, globally changed “Current_Transmit_Power_Level” to “Current_TX_Power_Level” and “Max_Transmit_Power_Level” to “Max_TX_Power_Level”. TSE 13484 (rating 3): Updated initial conditions, test Step 2, and pass verdicts for section containing test cases HCI/CIS/BV-01-C – -04-C to correct IXIT value used.

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			TSE 13495 (rating 4): To address an issue with missing tests for error cases in HCI_LE_Set_Periodic_Advertising_Enable, added new sections containing TCs HCI/DDI/BI-50-C – -61-C. Updated TCMT accordingly. TSE 13557 (rating 3): Updated MSC and test step for section containing test cases HCI/BIS/BV-01-C and -02-C to better align with spec. TSE 13584 (rating 4): To address Erratum 13407, added TC HCI/CCO/BI-43-C, an HCI test to return an error if the Connection_Handle isn't an ACL Connection. Updated TCMT accordingly. TSE 14623 (rating 4): To address E13498, which added error conditions to the HCI_LE_ADD_Device_To_Resolving_List command, added new TCs HCI/CCO/BI-46-C – -50-C. Updated TCMT accordingly. Subsequently updated after TSE re-opened and re-approved. TSE 14624 (rating 4): To address Erratum 13321, added TC HCI/CIS/BI-05-C, an HCI test to confirm that the IUT returns the indicated error under various error input conditions when using the HCI_LE_Set_CIG_Parameters command. Updated TCMT accordingly. TSE 14695 (rating 4): To address Erratum 12379, adding an HCI_LE_Set_Data_Related_Address_Changes command, added new TC HCI/DDI/BI-48-C. Updated TCMT accordingly. TSE 14701 (rating 4): To address Erratum 13374 to add an error when the Host flags ISOC support but the Controller doesn't support it, added a new section containing new TCs HCI/CCO/BI-44-C and -45-C. Updated TCMT accordingly. TSE 14810 (rating 4): To address Erratum 14700, which adds a new invalid parameter test for HCI_LE_Set_Extended_Scan_Enable, added new TC HCI/DDI/BV-06-C. Updated TCMT accordingly. TSE 14811 (rating 4): To address Erratum 14741, which added a new requirement to HCI_LE_Set_Periodic_Advertising_Enable, added new TC HCI/DDI/BV-07-C. Updated TCMT accordingly. TSE 14820 (rating 3): To address Erratum 14651, which modifies the disconnect behavior of a CIS prior to establishment, updated initial condition, MSCs, test steps, and pass verdict of section containing TCs HCI/CIS/BV-01-C – -04-C. TSE 14996 (rating 2): Updated TCMT entry for TC HCI/CM/BV-04-C. TSE 15018 (rating 2): Updated initial condition, MSC, test steps, and pass verdict for TC HCI/CM/BV-07-C to address a missing alternative.

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			TSE 15056 (rating 4): Added new TCs HCI/CIS/BV-06-C and HCI/BIS/BV-03-C. Updated TCMT accordingly. TSE 15071 (rating 4): Added new TC HCI/CIN/BV-12-C to test LL feature mask. Updated TCMT accordingly. TSE 15088 (rating 4): To address Erratum 15039, in which the Simultaneous_LE_Host parameter was removed in LE_Host_Support commands, deleted TC HCI/CCO/BV-02-C and updated test purpose, initial condition, MSC, and pass verdict and added Notes for TC HCI/CCO/BV-03-C. Updated TCMT accordingly. TSE 15239 (rating 4): To address an issue with adding Time_Stamp as an optional feature to “Isochronous data over HCI”, added sections with new TCs HCI/CIS/BV-09-C – -12-C and HCI/BIS/BV-05-C – -07-C. Updated TCMT accordingly. TSE 15240 (rating 3): To address Erratum 15021, updated reference for section containing TCs HCI/CIS/BV-01-C – -04-C (all other changes originally slated for this TSE were duplicated in TSE 14820 and incorporated there for Erratum 14651). TSE 15269 (rating 4): To address Erratum 14901, which involves receiving an error code when HCI_LE_Read_ISO_TX_Sync uses a CIS or BIS that doesn’t transmit SDUs, added new TCs HCI/CIS/BV-07-C and -08-C and HCI/BIS/BV-04-C. Updated TCMT accordingly. TSE 15270 (rating 4): To address Erratum 14893, which addresses changes to the Read/Write Connection Accept Timeout command for LE and changes to the CIS request command, added new TCs HCI/CIS/BI-06-C and -07-C. Updated TCMT accordingly. TSE 15277 (rating 4): To address E14841, which involves testing for a conflict in CIS parameters if a data path direction is set, added new TC HCI/CIS/BI-10-C. Updated TCMT accordingly. TSE 15278 (rating 4): To address E14916, which involves an error code when invalid BIG parameters are specified, added new TC HCI/BIS/BI-06-C. Updated TCMT accordingly. TSE 15433 (rating 1): Editorials to address Erratum 15348, globally changed “White List” to “Filter Accept List”. TSE 15440 (rating 1): Editorials to address Erratum 15358, globally changed parameter suffixes from “_S_TO_M” to “_P_TO_C” and “_M_TO_S” to “_C_TO_P”. Continued integration based on comment 69144, globally changed “s2m” to “p2c” and “m2s” to “c2p”. TSE 15445 (rating 1): Editorials to address Erratum 15361, globally changed “CSB” to “CPB”. Updated TCIDs in TCRL accordingly.

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			TSE 15448 (rating 1): Editorials to address Erratum 15334, globally changed “Master” to “Central” and “Slave” to “Peripheral”. TSE 15481 (rating 4): To address E15380, added new TCs HCI/CM/BI-02-C and -03-C. Updated TCMT accordingly. TSE 15489 (rating 1): Editorial to address Erratum 15334, in 4.1.4, changed “Master - Slave Switch” to “Role Switch”. TSE 15545 (rating 4): To address E15007, which addresses additional testing for CIS states, added a new CEN section to the Isochronous Streams section and added new TCs HCI/CIS/BI-13-C and HCI/CIS/BV-13-C. Updated TCMT accordingly. TSE 15599 (rating 4): Added two new sections containing new TCs HCI/PCL/BI-01-C – -08-C to address the need for invalid PHY tests for LE Power Level commands. Updated TCMT accordingly. TSE 15614 (rating 1): To address mismatched steps, updated MSC, test steps, and Pass Verdict for TC HCI/CCO/BI-13-C. TSE 15624 (rating 4): To address E13029, random address fails when HCI_LE_Set_Random_Address is not called, updated a parameter figure and the TCMT entry for TC HCI/DDI/BI-07-C and added two new sections containing TCs HCI/CCO/BI-51-C – -53-C and HCI/CCO/BI-54-C – -56-C. Updated TCMT accordingly. TSE 15667 (rating 1): Updated four instances of “LL 7/32 OR LL 7/33” to “LL 9/31” in TCMT. TSE 15675 (rating 4): To address missing HCI Read RSSI tests, added a new section containing new TCs HCI/CIN/BV-13-C and -14-C. Updated TCMT accordingly. TSE 15723 (rating 4): Added new TCs HCI/CIS/BI-01-C and -02-C and HCI/BIS/BI-01-C. Updated TCMT accordingly. TSE 15870 (rating 1): Updated a test step in TC HCI/CCO/BI-43-C to fix a command name copy-paste error. TSE 15887 (rating 2): Fixed a typo in the TCMT affecting TCs HCI/HFC/BV-09-C and -12-C. TSE 15935 (rating 3): To address E15843 regarding changes to the valid values of the Max_Transport_Latency parameter in the HCI_LE_Create_BIG command, updated the Part B MSC, added a couple of test steps, and updated step numbers in the pass verdict for the section containing TCs HCI/BIS/BV-01-C and -02-C. TSE 15953 (rating 4): To address E15745 regarding failure behavior of Set CIG Parameters, added new TC HCI/CIS/BI-11-C. Updated TCMT accordingly.

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			TSE 15955 (rating 3): To address E15223 regarding setup of an ISO Data Path before Accepting a CIS, updated test name, Test Purpose, MSC, test steps, and Pass verdict, as well as TCMT description, for TC HCI/CIS/BI-06-C. TSE 15960 (rating 4): To address E15640, "LE Set Host Feature command not allowed after connection to another device, not just after ACL established", added new TCs HCI/CSE/BV-08-C and -09-C. Updated TCMT accordingly. TSE 16022 (rating 1): Replaced MSC for test case HCI/HFC/BV-04-C to address changes required for Erratum 15837. (Note: Updated MSC includes change made under E15849 in r18.) TSE 16105 (rating 3): To address E16058 regarding a new error case in the HCI_LE_Create_CIS command, updated Test Purpose, references, MSC, tests steps, and Pass verdict of TC HCI/CIS/BV-05-C. TSE 16132 (rating 4): To test for Packet Too Long (0x45) for Periodic and Extended advertising, added new TCs HCI/DDI/BI-62-C – -66-C. Updated TCMT accordingly. TSE 16161 (rating 2): To address E16125 regarding clarifying HCI_Read_Buffer_Size return, updated reference and Pass verdict in section containing TCs HCI/CFC/BV-01-C and -03-C and in TCs HCI/CFC/BV-04-C and -05-C. TSE 16316 (rating 2): Updated MSC and Pass Verdict for TC HCI/DDI/BI-03-C to fix the returned event status. Continued incorporation by making language changes requested in comment 69937 and captured in update to CR in comment 69982. TSE 16335 (rating 4): To address an issue with missing CIS/BIG tests for invalid latencies, added new TCs HCI/BIS/BI-07-C and HCI/CIS/BI-12-C. Updated TCMT accordingly. TSE 16373 (rating 2): To address an issue with a controller that does not support ISO Broadcast Sync, needing to return Unknown Command, updated a test step in the section containing TCs HCI/BIS/BV-01-C and -02-C. TSE 16376 (rating 2): To address language/editorials from TSE 15269 review, updated the Test Purpose and Initial Condition of the section containing TCs HCI/CIS/BV-07-C and -08-C and of TC HCI/BIS/BV-04-C. TSE 16433 (rating 3): To address an issue with HCI Disconnect for ongoing CIS procedures not being valid, updated MSC (Part C) and related test step and pass verdict for section containing TCs HCI/CIS/BV-01-C – -04-C.

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			TSE 16571 (rating 4): To address E16299, HCI_Read_Clock_Offset on a Peripheral returns an HCI_Read_Clock_Offset_Complete event, added new TC HCI/CCO/BV-22-C (as modified from original TSE 16367, which was subsequently rejected in favor of this TSE). Updated TCMT accordingly. TSE 16902 (rating 2): Updated the section containing TCs HCI/CCO/BI-36-C and -37-C to correct an issue with the subrate and updated -38-C to add a missing command. TSE 16946 (rating 1): Updated the timeout settings for TC HCI/CCO/BI-39-C. TSE 17103 (rating 1): Removed LMP item from TCMT entry for TC HCI/CCO/BV-03-C. Incorporated ADI_In_Periodic_Advertising_Test_CR_r06: Added reference for HCI Core Spec, v5.3 or later; added new test cases HCI/CCO/BI-33-C and -34-C and HCI/DDI/BI-14-C; updated TCMT. Incorporated Enhanced_Connection_Update_TEST_CR_r17: Reference to Core v5.3 added in previous v5.3 CR; added new “Invalid Subrate Parameters” section and new test cases HCI/CCO/BI-36-C – -39-C. Updated TCMT accordingly. Incorporated Host_To_Controller_Encryption_Key_Control_Enhancements_TEST_CR_r06: Added reference for HCI Core Spec, v5.3 or later (was added under previous CR); added new test cases HCI/CCO/BV-21-C and BI-35-C; updated TCMT. Incorporated Test Issue 15477, affecting new test cases HCI/CCO/BI-33-C and -34-C. Incorporated Test Issue 15707: Updated test step numbering in test procedure and pass verdict for section containing TCs HCI/CCO/BI-36-C and -37-C. Incorporated Test Issues 15822, 15849, 15941, and 16029. Incorporated Test Erratum 16220, including new TCs HCI/DDI/BI-49-C and HCI/DDI/BV-08-C and -09-C. Template-related and consistency checker editorials.
29	p29	2021-07-13	Approved by BTI on 2021-06-27. Prepared for TCRL 2021-1 publication.
	p29ed2 r00–r03	2021-07-16 – 2021-08-12	TSE 17110 (rating 1): Replaced the MSC for the section containing TCs HCI/DDI/BI-63-C – 66-C. TSE 17233 (rating 1): Clarified test step for TC HCI/CIS/BI-08-C so that the handle is specified. TSE 17252 (rating 1): Clarified “Unsupported/Invalid” wording for sections containing TCs HCI/PCL/BI-01-C – -08-C.

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			TSE 17281 (rating 1): Corrected expected error code to "Memory Capacity Exceeded (0x07)" in test steps and pass verdict for section containing TCs HCI/DDI/BI-63-C – -66-C.
	p29 edition 2	2021-08-19	Approved by BTI on 2021-08-19. Prepared for edition 2 publication.
	p30r00–r05	2021-08-31 – 2022-01-04	TSE 16919 (rating 4): To accommodate E16769 "LE Set Periodic Advertising Parameters, advertising interval outside controller supported interval", modified the initial condition, test procedure, MSC, and Pass verdict for TCs HCI/DDI/BI-01-C and -02-C and added new TC HCI/DDI/BI-67-C. Updated TCMT accordingly. TSE 16928 (rating 4): To accommodate E16913 "HCI Read Buffer Size return value when (e)SCO not supported over HCI", updated test case configuration and Pass verdict for section containing TCs HCI/CFC/BV-01-C and -03-C and added new TCs HCI/CFC/BV-06-C and -07-C; converted section containing TC HCI/CFC/BV-04-C into a table-driven test, updating test case configuration and Pass verdict and adding new TC HCI/CFC/BV-08-C; converted section containing TC HCI/CFC/BV-05-C into a table-driven test, updating test case configuration and Pass verdict and adding new TC HCI/CFC/BV-09-C. Updated TCMT accordingly. TSE 17019 (rating 2): Replaced the MSCs for TCs HCI/CM/BV-02-C and -06-C to add Local_Resolvable_Private_Address and Peer_Resolvable_Private_Address parameters. TSE 17060 (rating 2): Corrected the error code in a test step for the section containing TCs HCI/CCO/BI-46-C – -48-C. Deleted TC HCI/CCO/BI-49-C and updated TCMT accordingly. TSE 17175 (rating 2): Replaced the MSC and updated a test step for TC HCI/CIS/BI-10-C to fix an incorrect parameter. TSE 17279 (rating 2): Updated initial condition, MSC, test steps, pass verdict, and TCMT entry for TC HCI/CCO/BI-50-C. TSE 17298 (rating 2): Corrected the PHY values in the tables for TC HCI/BIS/BI-06-C. TSE 17301 (rating 2): Corrected the MSC and test steps to include a step to add the tester to the periodic advertiser list for TC HCI/DDI/BV-08-C. TSE 17334 (rating 2): To remove a check on CisCount when a command is failing, updated the MSC, test steps, and Pass verdict for TC HCI/CIS/BI-11-C. TSE 17386 (rating 2): Added a column to the TC config table containing HCI/CCO/BI-36-C and -37-C to clarify which test case requires round 9.

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			TSE 17387 (rating 2): Revised Authenticated_Payload_Timeout to valid values for HCI/CCO/BI-39-C. TSE 17389 (rating 4): Updated the MSC, test steps, and pass verdict for HCI/DDI/BI-52-C. TSE 17595 (rating 3): Updated the test title, test purpose, and test steps for the section containing HCI/DDI/BI-63-C – -66-C to correct the advertising interval. Performed editorial work, including consistency checker fixes and aligning the copyright page with v2 of the DNMD.
30	p30	2022-01-25	Approved by BTI on 2021-12-27. Prepared for TCRL 2021-2 publication.
	p31r00–r11	2022-02-01 – 2022-05-12	TSE 16882 (rating 4): Added new section within the Controller Configuration section, including new test cases HCI/CCO/BI-57-C and -58-C. Added a TCMT entry for each new test case. TSE 17733 (rating 2): Updated the Initial Condition and test steps for the section containing HCI/SCO/BV-01-C – -04-C and the section containing HCI/SCO/BV-05-C – -08-C. TSE 17761 (rating 2): Updated the Initial Condition, Test Procedure, MSC, and TCMT entry for HCI/DDI/BI-01-C. TSE 17817 (rating 3): Revised the TC Config table, MSC, test steps, and Pass verdict, and added a Fail verdict, for the section containing HCI/DDI/BI-63-C – -66-C. TSE 17829 (rating 2): Corrected the MSCs, test steps, and Pass verdict for the section containing HCI/CIS/BV-01-C – -04-C. TSE 17834 (rating 2): Updated the Pass verdict for HCI/CIN/BV-12-C. TSE 17846 (rating 3): Replaced the MSC and revised a test step for HCI/CIS/BI-08-C; also revised the TCMT entry containing it and -09-C. TSE 17884 (rating 2): Updated MSC, test step, and Pass verdict for HCI/CIS/BI-08-C. TSE 17936 (rating 2): Updated test steps and Pass verdict, and added a Fail verdict, for the section containing HCI/CIN/BV-10-C and -11-C. TSE 17975 (rating 2): Updated Initial Condition, MSC, and TCMT entry for HCI/CCO/BV-22-C. TSE 17979 (rating 2): Updated MSC and test steps for HCI/DDI/BI-52-C (renumbered test steps and Pass verdict step numbers accordingly). TSE 18034 (rating 2): Replaced MSC for HCI/DDI/BV-07-C. TSE 18103 (rating 2): Updated the TCMT entry for HCI/DDI/BI-04-C.

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			TSE 18174 (rating 2): Updated test steps and Default Parameters table for HCI/CIS/BI-05-C. TSE 18223 (rating 1): Updated the MSC for HCI/CCO/BI-50-C. TSE 18236 (rating 2): Removed a Pass verdict for HCI/CIS/BI-11-C. TSE 18382 (rating 2): Added “Fields and Bits Reserved for Future Use” section. TSE 18495 (rating 3): Updated the MSC, test procedure, and expected outcome for HCI/SCO/BV-01-C – -04-C. TSE 18575 (rating 1): Updated the MSC and test steps for HCI/DDI/BI-04-C to use Options instead of a Filter Policy parameter. Editorials (template and consistency checker).
31	p31	2022-06-28	Approved by BTI on 2022-05-31. Prepared for TCRL 2022-1 publication.
	p31ed2r00	2022-07-19	TSE 18912 (rating 1): Updated IXIT values in the test procedure for HCI/DDI/BI-67-C.
	p31 edition 2	2022-08-24	Approved by BTI on 2022-08-22. Prepared for edition 2 publication.
	p32r00–r19	2022-08-24 – 2022-12-12	TSE 16290 (rating 4): Per E11702, added new TC HCI/GEV/BI-01-C; updated the TCMT accordingly. TSE 17713 (rating 4): Per E17646, added new sections containing new TCs HCI/CFC/BI-01-C – -4-C. Updated the TCMT accordingly. TSE 18190 (rating 3): Updated the initial condition, MSC, test steps, and pass verdict for the section containing HCI/CIS/BI-03-C and -04-C. TSE 18407 (rating 2): Revised MSCs parts C and D, test steps, and pass verdict for the section containing HCI/CIS/BV-01-C – -04-C. TSE 18551 (rating 3): To clarify an issue with the error code, updated the MSCs, test steps, and Pass verdicts for HCI/CIS/BI-05-C, HCI/BIS/BV-01-C and -02-C, and HCI/BIS/BI-06-C. TSE 18859 (rating 2): Corrected an issue with the Operation number by replacing the MSC and updating a test step for HCI/DDI/BI-52-C. TSE 18878 (rating 2): Updated the Initial Condition IXIT table, test steps, and Pass verdict step numbers for the section containing HCI/CCO/BI-57-C and -58-C. TSE 18882 (rating 4): Added a new section with new TCs HCI/CIS/BI-14-C and -15-C. Updated the TCMT accordingly. TSE 18992 (rating 2): Per E18401, updated the MSC and test steps for HCI/CIS/BI-05-C and HCI/CIS/BI-12-C. TSE 19020 (rating 2): Updated the MSC and a test step for HCI/DDI/BI-52-C.

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			TSE 19033 (rating 2): Replaced the MSC for HCI/CCO/BV-03-C. TSE 19210 (rating 4): Per E19197, added new TCs HCI/CCO/BI-59-C – -61-C. Updated TCMT accordingly. TSE 19233 (rating 4): Added a step to the test procedure for HCI/CCO/BI-57-C and -58-C and renumbered references to step numbers in the other steps and in the Pass verdict. Added new test cases HCI/BIS/BI-08-C and -09-C; updated the TCMT accordingly. TSE 19254 (rating 3): Updated the MSC and test steps for HCI/CIS/BI-05-C. TSE 19255 (rating 2): Updated the MSC, test steps, and pass verdict for HCI/DDI/BI-52-C. TSE 19280 (rating 4): Per E19215, added new TCs HCI/CIS/BI-16-C and -17-C. Updated the TCMT accordingly. TSE 20441 (rating 4): Added a new section with new TCs HCI/SCO/BV-09-C – -12-C. Updated the TCMT accordingly. TSE 20611 (rating 3): Per E18685: Updated MSC-B, added a test step, and fixed the step number in the TCID Config table and the Pass verdict accordingly for the section containing HCI/CIS/BV-01-C – -04-C. Revised a test step, added a row to the Rounds table, and updated the Pass verdict for HCI/BIS/BI-06-C. TSE 20618 (rating 2): Updated a test step in the section containing HCI/CIN/BV-10-C and -11-C. TSE 20628 (rating 1): Per E19163, corrected the error codes for HCI/BIS/BI-09-C. TSE 20663 (rating 4): Per E20482, added new TCs HCI/BIS/BV-08-C and HCI/CIS/BV-14-C. Updated the TCMT accordingly. TSE 22142 (rating 3): Per E17021, updated the Pass verdict for the section containing HCI/CIS/BV-09-C – -12-C and the section containing HCI/BIS/BV-06-C and -07-C. TSE 22157 (rating 1): Fixed a typo in the step number of a pass verdict for the section containing HCI/BIS/BV-01-C and -02-C. TSE 22179 (rating 1): Per E20424, removed HCI/SCO/BV-05-C to -08-C. Updated the TCMT accordingly. TSE 22338 (rating 1): Changed error code (“Status”) for round 4 of HCI/CCI/BI-04-C from “Advertising Timeout (0x3C)” to “TooLate (0x46)”. TSE 22395 (rating 1): Corrected the number of rounds in the TCID table to align with the final Rounds table.

Publication Number	Revision Number	Date	Comments
			Core v5.4 CRs: CSSA (from CR Coding_Scheme_Selection_on_Advertising_Test_CR_r08, including E18415 and E19196): Added new TC HCI/CCO/BV-23-C; updated TCMT accordingly. PAwR (from CR Periodic_Advertising_with_Responses_TEST_CR_r22): Added a new reference to Core v5.4. Added new TCs HCI/CCI/BI-01-C – -06-C. Updated TCMT accordingly. Template-related and consistency checker editorials.
32	p32	2023-02-07	Approved by BTI on 2022-12-28. Prepared for TCRL 2022-2 publication.
	p32ed2r00	2023-02-09	TSE 22728 (rating 1): Replaced text that was inserted in HCI/CIS/BI-05-C because of a bad cross-reference.
	p32 edition 2	2023-02-09	Approved by BTI on 2023-02-09. Prepared for edition 2 publication.
	p33r00–r05	2023-04-03 – 2023-05-23	TSE 18183 (rating 3): Updated the Pass verdict for HCI/BIS/BV-06-C and -07-C to expect a timestamp that is SDU_Interval. TSE 22287 (rating 2): Updated the TCMT entries for HCI/BIS/BV-01-C, -02-C, -05-C – -07-C, and BI-01-C and -06-C to fix an issue with Synchronized Receiver tests having Isochronous Broadcaster requirements. TSE 22357 (rating 2): Corrected the rounds table for HCI/CCI/BI-04-C. TSE 22426 (rating 2): Corrected the test steps for HCI/CCO/BI-38-C to include all relevant steps in repeat rounds. TSE 22473 (rating 2): Corrected the Advertising Handle in the Initial Condition and the rounds table for HCI/CCI/BI-01-C. TSE 22522 (rating 2): Corrected the error code for round 7 for HCI/CCI/BI-05-C. TSE 22621 (rating 2): Corrected an error code in HCI/CIS/BI-05-C and -12-C; updated MSCs, test steps, and Pass verdicts. TSE 22644 (rating 3): Deleted HCI/CIS/BI-17-C; updated MSC part C, test steps, and Pass verdict and added a Fail verdict for the section containing HCI/CIS/BV-01-C – -04-C to accommodate what was previously BI-17-C. Updated the TCMT accordingly. TSE 22650 (rating 2): Updated the Initial Condition for the section containing HCI/CIS/BI-03-C and -04-C so that the data path is configured. TSE 22663 (rating 2): To account for Central versus Peripheral, updated the MSC, test steps, and Pass verdict for the section containing HCI/SCO/BV-09-C – -12-C.

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			TSE 22688 (rating 4): Updated the Initial Condition, Test Case Configuration, Test Procedure, and Pass verdict for the section containing HCI/CCO/BI-57-C and -58-C and added new TC HCI/CCO/BI-62-C. Updated the TCMT accordingly. TSE 22861 (rating 1): Removed role name from the test descriptions for HCI/CCO/BI-06-C – -12-C. TSE 22877 (rating 2): Updated the TCMT entries for HCI/CCO/BI-57-C and -58-C. TSE 22943 (rating 2): Corrected the values in the rounds table for HCI/CCI/BI-04-C. TSE 22955 (rating 1): Deleted HCI/CFC/BI-01-C and -02-C. Corrected references for HCI/CFC/BI-03-C and -04-C. Updated TCMT accordingly. TSE 23188 (rating 1): Updated mistakenly numbered TCIDs HCI/CCI/BI-01-C – -06-C to the next available numbers in the series, HCI/CCO/BI-63-C – -68-C. Updated the TCMT accordingly.
33	p33	2023-06-29	Approved by BTI on 2023-06-05. Prepared for TCRL 2023-1 publication.
	p34r00–r09	2023-08-08 – 2024-01-29	TSE 17889 (rating 2): Updated the Initial Condition and Pass verdict of the section containing HCI/CIS/BV-09-C – -12-C. TSE 22932 (rating 2): Updated the Pass verdict for HCI/CCO/BI-39-C. TSE 22970 (rating 4): Updated the test case description, Test Purpose, and Initial Condition for HCI/CCO/BI-50-C. Added a new section with new TCs HCI/CCO/BI-69-C and -70-C. Updated TCMT accordingly. TSE 22992 (rating 2): Updated a test step in the section containing HCI/CCO/BI-46-C – -49-C. TSE 23060 (rating 2): Updated MSC and test procedure for HCI/CIS/BI-05-C. TSE 23122 (rating 2): Revised the MSC, test steps, and Pass verdict for the section containing HCI/CIS/BI-03-C and -04-C. TSE 23156 (rating 2): For the section containing HCI/CIS/BV-01-C – -04-C, updated the test config table, replaced MSCs C&D, and revised the test steps and the Pass verdict. TSE 23209 (rating 3): To accommodate changes needed to support E18552, updated the initial condition and pass verdict for the section containing HCI/CIS/BV-01-C – -04-C and updated the initial condition and a test step for standalone test HCI/CIS/BI-06-C. TSE 23215 (rating 2): Updated the MSC and test steps for HCI/BIS/BI-08-C. TSE 23309 (rating 2): Added a new section to the TSS for “HCI command and event version”.

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			TSE 23438 (rating 2): Updated the TCMT entry for HCI/CIS/BI-11-C and moved HCI/CIS/BI-05-C to a different TCMT entry. TSE 23440 (rating 1): Editorials to clean up the Isochronous Channels section of the TCMT. TSE 23445 (rating 2): Revised the TCMT entries for HCI/CCO/BI-57-C and -58-C. TSE 23466 (rating 3): Per E23242, updated the test procedure for HCI/CCO/BI-67-C and -68-C. TSE 23521 (rating 1): Corrected an IXIT parameter name in the section containing HCI/CCO/BI-57-C, -58-C, and -62-C. TSE 23564 (rating 1): Replaced the MSCs and updated the captions for the section containing HCI/BIS/BV-01-C and-02-C. TSE 24094 (rating 1): Replace SUM ICS references with CORE ICS references in the TCMT (affects HCI/DDI/BI-08-C, -09-C, and -12-C and HCI/CCO/BV-05-C). TSE 24581 (rating 2): Updated the TCMT entries for HCI/CIS/BV-07-C, -11-C, and -12-C from HCI 20/6 (no longer exists) to HCI 20/4. TSE 24840 (rating 2): Removed Core.ICS dependencies in the TCMT for HCI/DDI/BI-08-C, -09-C, and -12-C.
34	p34	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.
	p35r00–r35	2024-05-20 – 2024-07-31	Incorporated CR Monitoring Advertising_Test_CR_r02. To account for the Monitoring Advertisers feature in Core Specification v6.0, added new tests HCI/CCO/BV-24-C and HCI/CCO/BI-71-C. Updated the TCMT accordingly. Updated the references list. Incorporated CR Decision_Based_Advertising_Filtering_TEST_CR_r17 (which includes Test Issues 20399 [TI 18581, 18583, 18584, 18928, 19316, 19330, 19331], 20408, 20411, 20412, 20413, 20414, 20415, 20418, 20462, 20468, 20517, 20523, 20555, 20563, 20565, 22454, 22455, 22472, 22497, 22907, 22915, 23436, 24156, 24788). To account for the Decision Based Advertising Filtering feature in Core Specification v6.0, updated references from SUM ICS to CORE ICS; added new test cases HCI/DDI/BI-68-C and -69-C, HCI/CCO/BI-72-C – -74-C, and HCI/CCO/BV-25-C. Updated the TCMT accordingly. Updated the reference list.

Publication Number	Revision Number	Date	Comments
			Incorporated CR Enhancements_for_ISOAL_TEST_CR_r12 (which includes Test Issues 22481, 22725, 23116, 23360, 23385, 23913, 23920, 24024, 24096, 24828, 24829, 24830, 24937). To account for the Enhancements for ISOAL feature in Core Specification v6.0, updated the Isochronous Streams section, adding new tests HCI/CIS/BV-15-C – -18-C, HCI/CIS/BI-18-C, HCI/BIS/BI-10-C and -11-C and updating existing test HCI/BIS/BI-06-C. Updated the TCMT accordingly. Updated the references list. Incorporated CR Core_LLExtendedFeatureSet_Test_CrR11 (which includes Test issues 24450, 24696, 24807, 24896, 24905). To account for the Low Energy Extended Feature Set feature in Core Specification v6.0, updated the Controller Information section as follows: updated HCI/CIN/BV-09-C and -12-C and added new test HCI/CIN/BV-15-C. Updated the TCMT accordingly. Updated the references list. Incorporated the changed parts of the Monitoring Advertising_Test_CR_r03 (changes only for Test Issue 25248). Incorporated CR Frame Space Update_Test_CR_r08 (which includes Test Issues 25371, 25444, 25452, 25453, 25470, 25471, 25475). To account for the Frame Space Update feature in Core Specification v6.0, performed the following updates: Updated the Controller Configuration section, adding new tests HCI/CCO/BI-75-C – -78-C. Updated the TCMT accordingly. Incorporated CR CS_Test_CR_r16-jorg (which includes Test Issues 23205, 23293, 23331, 23332, 23361, 23362, 23363, 23364, 23365, 23378, 23379, 23381, 23382, 23384, 23404, 23419, 23422, 23424, 23425, 23500, 23501, 23502, 23503, 23504, 23506, 23594, 23693, 23694, 23696, 23701, 23706, 23711, 23732, 23736, 23737, 23738, 23776, 23842, 23923, 23993, 24023, 24033, 24043, 24049, 24133, 24135, 24137, 24138, 24139, 24141, 24142, 24143, 24146, 24147, 24149, 24150, 24151, 24153, 24177, 24181, 24231, 24232, 24330, 24331, 24332, 24410, 24411, 24418, 24419, 24478, 24483, 24515, 24531, 24599, 24601, 24602, 24614, 24618, 24619, 24621, 24623, 24624, 24625, 24627, 24630, 24639, 24645, 24646, 24655, 24656, 24657, 24659, 24660, 24669, 24681, 24717, 24769, 24776, 24789, 24808, 24809, 24838, 24844, 24850, 24867, 24868, 24893, 24894, 24895, 25028, 25029, 25040, 25042, 25053, 25055, 25111, 25112, 25120, 25139, 25140, 25141, 25142, 25143, 25148, 25149, 25150, 25157, 25166, 25209, 25240, 25278, 25282, 25299, 25428, 25443, 25479, 25498, 25511, 25512, 25525, 25585, 25617, 25632). To account for the Channel Sounding feature in Core Specification v6.0, added new TCs HCI/CCO/BI-79-C – -115-C and HCI/CCO/BV-26-C. Updated the references list.

Publication Number	Revision Number	Date	Comments
			TSE 22390 (rating 4): Per E22181, added new TCs HCI/BIS/BI-12-C – -15-C and HCI/CIS/BI-19-C – -22-C. Updated the TCMT accordingly. TSE 22967 (rating 4): Per E22341, added new TCs HCI/DDI/BI-70-C and -71-C. Updated the TCMT accordingly. TSE 22974 (rating 3): Per E22620, added round 3 to rounds table for HCI/CCO/BI-63-C. TSE 23119 (rating 4): Per E22479, added new TCs HCI/DDI/BI-72-C and -73-C. Updated the TCMT accordingly. TSE 23370 (rating 4): Per E23166, updated the TC description and TCMT entries for HCI/CIS/BV-01-C – -04-C and -15-C – -18-C. Added new TCs HCI/CIS/BV-19-C – -22-C. TSE 23565 (rating 4): Per E23069, added new TCs HCI/BIS/BV-09-C and -10-C. Updated the TCMT accordingly. TSE 23922 (rating 2): Updated MSCs for HCI/BIS/BI-07-C and HCI/CIS/BI-12-C, and updated test procedure for HCI/BIS/BI-07-C. TSE 24000 (rating 3): Updated the test case configuration and test procedure for HCI/CCO/BI-57-C, -58-C, and -62-C. TSE 24027 (rating 3): Per E24009, updated the test procedure and rounds table for HCI/CCO/BI-66-C, and also updated the initial condition. TSE 24028 (rating 3): Per E23428, added new TC HCI/BIS/BV-11-C. Updated the TCMT accordingly. TSE 24108 (rating 2): Updated the TCMT entries for HCI/CCO/BI-52-C and -55-C. TSE 24233 (rating 1): Updated the Pass verdict for HCI/CIN/BV-01-C. Updated the references list. TSE 24275 (rating 4): Per E17736, added new TCs HCI/CCO/BI-118-C and -119-C. Updated the TCMT accordingly. TSE 24315 (rating 2): Added return error code for round 1 and updated the expected outcome for HCI/BIS/BI-08-C. TSE 24333 (rating 4): Per E23108, updated the test procedure and Pass verdict for HCI/CCO/BI-67-C. TSE 24432 (rating 2): Updated the initial condition for HCI/BIS/BI-08-C. TSE 24686 (rating 4): Per E24617, added new TC HCI/AEN/BI-02-C, converting TC HCI/AEN/BI-01-C into the table-driven format. Updated the TCMT accordingly. TSE 24689 (rating 2): Updated the TCMT entries for HCI/CSE/BV-08-C and -09-C. TSE 24726 (rating 3): Per E24039, updated the test case configuration and rounds tables for HCI/CCO/BI-64-C and -65-C.

Publication Number	Revision Number	Date	Comments
			TSE 24885 (rating 4): Per E24855, added new TC HCI/BIS/BI-16-C. Updated the TCMT accordingly. TSE 24940 (rating 2): Updated the TC configuration table, test procedure, and Pass verdict and replaced Part C of the MSC for HCI/CIS/BV-01-C – -04-C. TSE 25049 (rating 2): Updated the TCMT entries for HCI/BIS/BI-01-C, -07-C, -10-C, -12-C, and -13-C and HCI/BIS/BV-01-C, -02-C, and -05-C – -11-C. TSE 25485 (rating 1): Updated the table reference for the HCI/CIN/BV-12-C Pass verdict. TSE 25848 (rating 2): Updated the TCMT entries for HCI/SCO/09-C – -12-C. Incorporated approved Test Issues 22858, 24735, 25241, 25302, 25486, 25673, 25676, 25750, 25790, and (per E25800) 25805. Incorporated integration review feedback and made editorial, formatting, and consistency checker updates.
35	p35	2024-09-04	Approved by BTI on 2024-08-14. Prepared for TCRL 2024-2 publication.
	p35ed2r00	2024-09-26	TSE 26352 (rating 1): Corrected a typographical error in the heading of the Broadcast Isochronous Stream Using Non-Test Command, Isochronous Broadcaster section.
	p35 edition 2	2024-10-24	Approved by BTI on 2024-10-16. Prepared for edition 2 publication.
	p36r00–r12	2024-10-28 – 2024-12-02	TSE 24673 (rating 4): Per E22167, added new TC HCI/CCO/BI-120-C. Updated the TCMT accordingly. TSE 25048 (rating 4): Updated the test name, test purpose, initial condition, test procedure, and expected outcome for HCI/HFC/BV-04-C and added new TCs HCI/HFC/BV-14-C – -16-C. Updated the TCMT accordingly. TSE 25087 (rating 3): Updated the test purpose, MSC, test steps, and Pass verdict for HCI/BIS/BI-08-C. TSE 25205 (rating 4): Per E25046, added new TC HCI/AEN/BV-09-C. Updated the TCMT accordingly. TSE 25652 (rating 3): Per E25212, added a round to the section containing TCs HCI/CCO/BI-64-C and -65-C. TSE 25670 (rating 3): Per E24039, added a round to the section containing TCs HCI/CCO/BI-64-C and -65-C. TSE 25907 (rating 1): Updated the test purpose and MSC for HCI/BIS/BI-06-C. Updated the test procedure for HCI/BIS/BV-08-C. TSE 26037 (rating 2): Moved HCI/CCO/BI-88-C from the Test Case Configuration table for the “LE CS Set Default Settings, Invalid Parameters” section into its own section.

Publication Number	Revision Number	Date	Comments
			TSE 26142 (rating 2): Updated the pass verdict and reference for HCI/CIN/BV-15-C, deleted former HCI/CIN/BV-16-C as a duplicate, and updated the TCMT accordingly. TSE 26151 (rating 2): Updated the TCMT for HCI/BIS/BV-09-C and -10-C. TSE 26161 (rating 4): Added new TCs HCI/CCO/BI-121-C and -122-C to the section containing HCI/CCO/BI-44-C and -45-C to cover additional feature bits. Updated the TCMT accordingly. TSE 26198 (rating 2): Updated the TCMT for HCI/CCO/BI-76-C and -77-C. TSE 26200 (rating 2): Updated the TCMT for HCI/CCO/BI-107-C. TSE 26295 (rating 3): Updated the Pass verdict for HCI/CIS/BI-18-C and the test purpose and Pass verdict for HCI/BIS/BI-10-C. TSE 26321 (rating 2): Deleted Round 7 and renumbered what were Rounds 8 and 9 in the test procedure for HCI/CCO/BI-95-C. TSE 26332 (rating 1): Updated the TC description for HCI/CIS/BV-15-C – -22-C in the TC configuration table and the corresponding feature values in the TCMT. Updated the feature value in the TCMT for HCI/BIS/BI-10-C and -11-C and HCI/CIS/BI-18-C. TSE 26360 (rating 1): Deleted Round 8 and renumbered what were Rounds 9 and 10 in the test procedure for HCI/CCO/BI-95-C. TSE 26426 (rating 1): Per E26162, changed all instances of "antennas" to "antennae". Changed back to "Antenna" in HCI/CCO/BI-115-C to match the parameter. TSE 26437 (rating 3): Updated the test steps for HCI/CCO/BI-112-C. TSE 26479 (rating 1): Replaced TSPX_CS_Role with "a supported role" in the test procedure for HCI/CCO/BI-91-C and -112-C. Updated the initial condition and test procedure for HCI/CCO/BI-106-C. TSE 26487 (rating 2): Updated the initial condition for HCI/CCO/BI-84-C and -85-C. TSE 26493 (rating 2): Updated the TCMT entries for HCI/CIS/BI-18-C and HCI/BIS/BI-10-C. TSE 26507 (rating 1): Updated the test procedure for HCI/CCO/BI-94-C to fix incorrect PDU fields. TSE 26542 (rating 1): Updated a reference to LL ICS Table 2 to refer to the correct table for HCI/CIN/BV-12-C and -15-C. Updated a cross-reference to refer to the correct reference document for HCI/CIN/BV-15-C. TSE 26554 (rating 2): Corrected the test procedure and IXIT values for HCI/CCO/BI-95-C. TSE 26573 (rating 2): Updated the test procedure and added an Inconclusive verdict statement for HCI/DDI/BI-04-C.

Publication Number	Revision Number	Date	Comments
			Updated the TCMT introduction to align with the current TS template.
36	p36	2025-02-18	Approved by BTI on 2024-12-26. Prepared for TCRL 2025-1 publication.
	p37r00– r14	2025-01-23 – 2025-03-27	Incorporated the Randomized RPA Updates_Test_CR_r05 test CR. Added new TCs HCI/DDI/BV-10-C and -11-C and HCI/DDI/BI-74-C. Updated the TCMT accordingly. TSE 23560 (rating 4): Per E22342, converted HCI/CCO/BI-67-C into a table-driven test, adding new TC HCI/CCO/BI-124-C. Updated the TCMT accordingly. TSE 24671 (rating 4): Per E18973, added a new section with new TCs HCI/CM/BI-04-C and -05-C. Updated the TCMT accordingly. TSE 24757 (rating 3): Per E22918, updated the test description, test purpose, MSC, and a test step and added a new column to the rounds table for the section containing HCI/SCO/BV-09-C – -12-C. TSE 25200 (rating 1): Per E25131, updated “Connection Rejected” errors to “Rejected”. TSE 25208 (rating 3): Per E24662, updated round 8 and added a round for the section containing HCI/CCO/BI-64-C and -65-C. TSE 25962 (rating 4): Added a new section with new TCs HCI/CCO/BI-125-C – -127-C. Updated the TCMT accordingly. TSE 26015 (rating 1): Per E25633, corrected a parameter name for HCI/CCO/BI-81-C. TSE 26044 (rating 4): Per E26064, converted HCI/CCO/BI-116-C into a table-based test, adding new TC HCI/CCO/BI-123-C. Updated the TCMT accordingly. TSE 26510 (rating 4): Added parameter and bit values to the test case configuration table and updated the Pass verdict for the section containing HCI/CCO/BI-79-C, -80-C, and -81-C and added new TCs to the table HCI/CCO/BI-128-C – -32-C. Updated the TCMT accordingly. TSE 26606 (rating 2): Updated the initial condition and test steps for HCI/CCO/BI-116-C. TSE 26621 (rating 3): Added an LL PDU column to the rounds table and added a Fail verdict for HCI/CCO/BI-117-C. TSE 26732 (rating 2): Replaced the MSC and updated the test procedure and Pass verdict for the section containing HCI/CCO/BI-113-C and -114-C. TSE 26757 (rating 3): Corrected the parameters in the test purpose, initial condition, MSC, and test steps for the section containing HCI/DDI/BI-70-C and -71-C. TSE 26759 (rating 2): Corrected an event name in a test step and the Pass verdict for HCI/CCO/BI-63-C.

Publication Number	Revision Number	Date	Comments
			TSE 26763 (rating 2): Corrected a test step for HCI/BIS/BV-11-C. TSE 26878 (rating 1): Corrected a reference in an initial condition for the section containing HCI/CCO/BI-57-C, -58-C, and -61-C. TSE 26879 (rating 3): Corrected the parameters mentioned in the test steps for the section that contains HCI/CCO/BI-76-C and -77-C. TSE 26919 (rating 4): Deleted HCI/HFC/BV-16-C and added new TCs HCI/HFC/BV-17-C – -19-C. Updated the TCMT accordingly. TSE 27116 (rating 1): Per E25333, changed RSSI_Threshold_Low to RSSI_Low_Threshold and RSSI_Threshold_High to RSSI_High_Threshold in HCI/CCO/BI-71-C. TSE 27226 (rating 3): Corrected initial conditions and test steps to remove unneeded IXIT material. Affects test cases HCI/BIS/BI-07-C and HCI/CIS/BI-05-C, -10-C, and -12-C.
37	p37	2025-05-06	Approved by BTI on 2025-04-16. Prepared for TCRL 2025-2 publication.
	p38r00–r04	2025-07-11 – 2025-08-18	TSE 26648 (rating 3): Deleted TCs HCI/BIS/BI-13-C and -15-C and HCI/CIS/BI-21-C and -22-C. Updated the Test Purpose, Initial Condition, TCC table variables, test steps, Pass verdict, and TCID descriptions for HCI/CIS/BI-19-C and -20-C. Converted HCI/BIS/BI-12-C and -13-C into standalone tests with the deletion of -13-C and -15-C and updated the TCID description, Test Purpose, test steps, and Pass verdict. Updated the TCMT accordingly. TSE 26758 (rating 2): Corrected step numbering in the section containing HCI/CCO/BI-67-C and -124-C. TSE 27130 (rating 4): To support E26941, added new TC HCI/CCO/BI-148-C. Updated the TCMT accordingly. TSE 27140 (rating 4): To support E26039, added new TC HCI/CCO/BV-27-C. Updated the TCMT accordingly. TSE 27165 (rating 2): Clarified an initial condition and updated the MSC accordingly for HCI/AEN/BV-05-C. TSE 27231 (rating 2): Updated the TCMT entries for HCI/DSU/BV-02-C and HCI/DDI/BV-03-C. TSE 27253 (rating 2): Updated the test steps and Pass verdict for HCI/CCO/BV-23-C, as well as associated TCMT changes. TSE 27343 (rating 2): Corrected the TCMT entry for HCI/DDI/BI-69-C. TSE 27344 (rating 2): Removed an unnecessary round from the rounds table for HCI/CCO/BI-95-C.

Publication Number	Revision Number	Date	Comments
			TSE 27386 (rating 2): Corrected the MSC, test steps, and Pass verdict for the section containing HCI/CIS/BV-01-C – -04-C, -15-C – -22-C. TSE 27476 (rating 2): Updated the MSC and test steps for HCI/CIS/BV-06-C, the section containing HCI/BIS/BV-01-C and -02-C, and HCI/BIS/BV-03-C, correcting step numbers throughout as needed to align. TSE 27510 (rating 2): Corrected the TCMT entries for HCI/BIS/BV-08-C and HCI/CIS/BV-14-C. TSE 27544 (rating 3): Moved HCI/CCO/BI-23-C and -24-C to their own new section, with updated TCID descriptions. Updated the remaining section containing HCI/CCO/BI-18-C – -22-C and -25-C – -32-C, with updated TCID descriptions, updated section name, updated Test Purpose, and updated reference. Made TCMT Feature description changes to align. TSE 27649 (rating 3): Updated the test steps and Pass verdict for HCI/CCO/BV-26-C. TSE 27733 (rating 2): Corrected the parameter names in the TCC table for HCI/CCO/BI-79-C and -128-C; corrected the TCMT entries for HCI/CCO/BI-79-C – -81-C, and -128-C, -130-C, and -132-C. TSE 27744 (rating 2): Deleted two rounds from the rounds table for HCI/CIS/BI-05-C and updated round numbers throughout the test to align. TSE 27808 (rating 2): Corrected an initial condition for the section containing HCI/CCO/BI-60-C and -61-C. TSE 27883 (rating 1): Corrected a step number reference in HCI/CSE/BV-08-C. TSE 27934 (rating 4): Incorporated Shorter Connection Intervals Test CR r13 to integrate the Shorter Connection Intervals feature for Core v6.2. Added references to LL and HCI parts of Core v6.2 to the References section; added new TCs HCI/CCO/BI-133-C – -142-C; updated HCI/CCO/BI-63-C with an additional round. Updated the TCMT accordingly. To address E27495, incorporated Test Issue 27749, adding a new section with new TCs HCI/CCO/BI-143-C – 146-C. Updated the TCMT accordingly. To address E27871, incorporated Test Issue 27898, adding new TC HCI/CCO/BI-147-C. Updated the TCMT accordingly.
38	p38	2025-11-04	Approved by BTI on 2025-10-05. Prepared for TCRL pkg101 publication.
	p39r00–r16	2025-11-24 – 2026-02-19	TSE 23206 (rating 4): To accommodate the changes made for ES-23217, added a new “Event Versioning” section and new TCs HCI/EVV/BV-01-C – -18-C. Updated the Test Groups and TCID conventions sections to reflect the new test type. Updated the TCMT accordingly.

Publication Number	Revision Number	Date	Comments
			TSE 25826 (rating 4): Adjusted the test purpose and test steps for HCI/CCO/BI-95-C and added new TC HCI/CCO/BI-149-C. Updated the TCMT accordingly. TSE 26867 (rating 1): Added a new HCI_Command_Status event alternatives subsection to the Generic Events section. The new subsection defines options the IUT can take sending an HCI_Command_Status event when reporting an error. TSE 27272 (rating 4): Added new TC HCI/DDI/BV-12-C. Updated the TCMT accordingly. TSE 27417 (rating 4): Moved SCO tests from LMP to HCI layer, creating new TCs HCI/SCO/BV-13-C – -16-C. Updated TCMT accordingly. TSE 27957 (rating 4): To accommodate the changes needed for ES-27276, added a reference to Core v6.3 to the References section, updated the references for and added new rounds to the Rounds table for HCI/CCO/BI-107-C, and added new TCs HCI/CCO/BI-150-C – -155-C. Updated the TCMT accordingly. TSE 28037 (rating 3): Corrected the test steps for the section containing HCI/CCO/BI-143-C – -146-C. TSE 28045 (rating 1): For HCI/HFC/BV-03-C, updated the TC description command name from HCI_Set_Event_Mask_2 to HCI_Set_Event_Mask_Page_2, replaced the MSC, and updated the test purpose, initial condition, test procedure, pass verdict, and fail verdict. Updated the TCMT accordingly. TSE 28072 (rating 2): Updated the values for Rounds 15 and 16 in the rounds table for the section containing HCI/CCO/BI-137-C and -138-C. TSE 28083 (rating 3): Added a Pass verdict to the section containing HCI/CCO/BI-67-C and -124-C. TSE 28096 (rating 2): Added an initial condition and updated a test step for the section containing HCI/BIS/BV-01-C and -02-C. TSE 28337 (rating 3): To accommodate the changes needed for ES-25494, updated invalid parameters in the Rounds tables for HCI/CCO/BI-66-C and for the section containing HCI/CCO/BI-67-C and -124-C. TSE 28410 (rating 2): Updated the TCMT entry for HCI/CCO/BI-139-C and -147-C, combining them into a single row. TSE 28412 (rating 2): Corrected a test step and the Pass verdict for the section containing HCI/CCO/BI-143-C – -146-C. TSE 28474 (rating 1): To accommodate ES-28451, changed “host” to “Host” globally. Made other capitalization changes for PDU and command names as noted in the TSE comments. TSE 28557 (rating 3): Corrected the TCID description, test purpose, and test step for HCI/CCO/BI-148-C.

Publication Number	Revision Number	Date	Comments
			TSE 28647 (rating 2): Incorporated material for the Running Out of Bits feature of Core v6.3. Converted the section containing HCI/CIN/BV-03-C into a table-based test, updating the MSC/test procedure, test condition, and Pass verdict and adding new TC under TSE 28808. Converted the section containing HCI/HFC/BV-04-C into a table-based test, updating the test purpose and MSC/test procedure and adding new TC under TSE 28808. Converted the section containing HCI/HFC/BV-14-C into a table-based test, updating the test purpose and MSC/test procedure and adding new TC under TSE 28808. Converted the section containing HCI/HFC/BV-15-C into a table-based test, updating the test purpose and MSC/test procedure and adding new TC under TSE 28808. TSE 28688 (rating 2): Incorporated material for the Channel Sounding RTT-PHY feature of Core v6.3. For the section containing HCI/CCO/BI-79-C – -81-C and -128-C – -132-C, updated the initial conditions, added an HCI Command Version column to the TCC table, updated a test step, and added new TCs under TSE 28809. TSE 28799 (rating 1): To accommodate the changes needed for ES-28262, corrected all instances of “RTT Precision” to “RTT Accuracy”. TSE 28808 (rating 4): The detailed changes from the Core v6.3 ROOB CR are noted at TSE 28647. This TSE captures only Category 4 changes, which involves adding new TCs HCI/CIN/BV-17-C and HCI/HFC/BV-20-C to -22-C. Updated the TCMT accordingly. TSE 28809 (rating 4): The detailed changes from the Core v6.3 RTT-PHY CR are noted at TSE 28688. This TSE captures only Category 4 changes, which involves adding new TCs HCI/CCO/BI-156-C to -160-C. Updated the TCMT accordingly.
39	p39	2026-05-05	Approved by BTI on 2026-04-07. Prepared for TCRL pkg103 publication.

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Name	Company
Juan Manuel Hidalgo	AT4 Wireless
Elisa Rincón	AT4 Wireless
Nathan Burns	Bluetooth SIG, Inc.
Matt Canavan	Bluetooth SIG, Inc.
Gene Chang	Bluetooth SIG, Inc.
Virgil Dragomir	Bluetooth SIG, Inc.
Jeff Drake	Bluetooth SIG, Inc.
Tharon Hall	Bluetooth SIG, Inc.
Alicia Courtney	Broadcom Corporation



Name	Company
Mayank Batra	CSR
Peter Flittner	CSR
Robin Heydon	CSR
Simon Morris	CSR
Magnus Sommansson	CSR
Fabien Duvoux	Ellisys
Kyle Penri-Williams	Ellisys
Clement Vacheron	Ellisys
Robert Kyacek	EM Microelectronics
Frank Karlsen	Nordic Semiconductor
Rasmus Abildgren	Samsung Electronics Co., Ltd.
Ben Brown	Teledyne LeCroy
Martti Soderlund	TietoEnator