Phone Alert Status Profile (PASP)

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 Phone Alert Status Profile Specification 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 [2].

- [1] Test Strategy and Terminology Overview
- [2] Bluetooth Core Specification, Version 4.0 or later
- [3] ICS Proforma for Phone Alert Status Profile, PASP.ICS
- [4] Phone Alert Status Profile Specification, Version 1.0
- [5] GAP Test Suite, GAP.TS
- [6] GATT Test Suite, GATT.TS
- [7] Phone Alert Status Service Specification, Version 1.0
- [8] Phone Alert Status Service Test Suite, PASS.TS

2.2 **Definitions**

In this Bluetooth document, the definitions from [1] and [2] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1] and [2] apply.

3 Test Suite Structure (TSS)

3.1 Overview

The Phone Alert Status Profile is a client of the Generic Attribute Profile (GATT). This is illustrated in Figure 3.1.

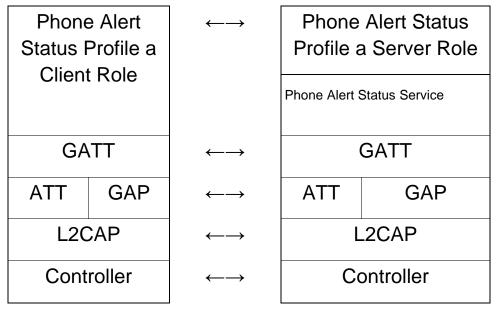


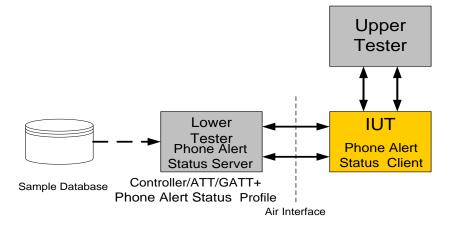
Figure 3.1: Phone Alert Status Profile test model

3.2 Test Strategy

The test objectives are to verify functionality of the Phone Alert Status Profile within a Bluetooth Host and enable interoperability between Bluetooth Hosts on different devices. The testing approach covers mandatory and optional requirements in the specification and matches these to the support of the IUT as described in the ICS. Any defined test herein is applicable to the IUT if the ICS logical expression defined in the Test Case Mapping Table (TCMT) evaluates to true.

The test equipment provides an implementation of the Radio Controller and the parts of the Host needed to perform the test cases defined in this Test Suite. A Lower Tester acts as the IUT's peer device and interacts with the IUT over-the-air interface. The configuration, including the IUT, needs to implement similar capabilities to communicate with the test equipment. For some test cases, it is necessary to stimulate the IUT from an Upper Tester. In practice, this could be implemented as a special test interface, a Man Machine Interface (MMI), or another interface supported by the IUT.

This Test Suite contains Valid Behavior (BV) tests complemented with Invalid Behavior (BI) tests where required. The test coverage mirrored in the Test Suite Structure is the result of a process that started with catalogued specification requirements that were logically grouped and assessed for testability enabling coverage in defined test purposes.



The following configuration is recommended for testing Phone Alert Status client IUT:

Figure 3.2: Phone Alert Status Profile Client test configuration

3.3 Test groups

The following test groups have been defined:

- Generic GATT Integrated Tests
- Configuration Features
- Write Features
- Notify Features



4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [1]. The convention used here is: <spec abbreviation>/<IUT role>/<class>/<feat>/<func>/<subfunc>/<cap>/<xx>-<nn>-<y>.

Additionally, testing of this specification includes tests from the GATT Test Suite [6] referred to as Generic GATT Integrated Tests (GGIT); when used, the test cases in GGIT are referred to through a TCID string using the following convention:

Identifier Abbreviation	Spec Identifier <spec abbreviation=""></spec>	
PASP	Phone Alert Status Profile	
Identifier Abbreviation	Role Identifier <iut role=""></iut>	
CL	Phone Alert Status Profile Client	
Identifier Abbreviation	Reference Identifier <ggit group="" test=""></ggit>	
CGGIT	Client Generic GATT Integrated Tests	
Identifier Abbreviation	Reference Identifier <ggit class=""></ggit>	
СНА	Characteristic	
SER	Service	
Identifier Abbreviation	Feature Identifier <feat></feat>	
РРСВ	Phone Alert Status Profile Client Behavior	
PPCF	Phone Alert Status Profile Configure Features	
PPNF	Phone Alert Status Profile Notify Features	
PPWF	Phone Alert Status Profile Write Features	
TPCN	Profile Connection	

<spec abbreviation>/<IUT role>/<GGIT test group>/< GGIT class >/<xx>-<nn>-<y>.

Table 4.1: PASP 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 Pass/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.

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.

4.2 Setup preambles

4.2.1 Set up LE Transport

Use GATT.TS [6] Preamble [Set up ATT Bearer over LE].



4.3 Generic GATT Integrated Tests

Execute the Generic GATT Integrated Tests defined in [6] in Section 6.4, Client test procedures, using Table 4.2 below as input:

TCID	Service / Characteristic	Reference	Properties	Value Length (Octets)	Service Type
PASP/CL/CGGIT/SER/BV-01-C [Service GGIT – Phone Alert Status]	Phone Alert Status Service	[4] 4.1	-	-	Primary Service
PASP/CL/CGGIT/CHA/BV-01-C [Characteristic GGIT – Alert Status]	Alert Status Characteristic	[4] 4.2	0x12 (Read, Notify)	1	-
PASP/CL/CGGIT/CHA/BV-02-C [Characteristic GGIT – Ringer Setting]	Ringer Setting Characteristic	[4] 4.2	0x12 (Read, Notify)	1	-
PASP/CL/CGGIT/CHA/BV-03-C [Characteristic GGIT – Ringer Control Point]	Ringer Control Point Characteristic	[4] 4.2	0x04 (Write Without Response)	Skip	-

Table 4.2: Input for the GGIT Client test procedure

4.4 Configuration Feature

Verify Phone Alert Status Server IUT implementation of the Features defined in the Phone Alert Status Profile Specification [4] by a Phone Alert Status Server IUT, and usage of the same features by a Phone Alert Status Client IUT.

PASP/CL/PPCF/BV-01-C [Alert Status Characteristic Configuration, write with 0x0001]

Test Purpose

Verify that the Phone Alert Status Client IUT can configure the Client Characteristic Configuration of Alert Status in a Phone Alert Status Server.

Reference

[4] 4.5

- Initial Condition
 - A preamble procedure defined in Section 4.2 is used to set up the transport and L2CAP channel.
 - The Lower Tester includes one instantiation of the Phone Alert Status Service [7].
 - The IUT has executed PASP/CL/CGGIT/CHA/BV-01-C [Characteristic GGIT Alert Status], and has saved the handle of a Client Characteristic Configuration for Alert Status Characteristic.
- Test Procedure

The Upper Tester issues a command to the IUT to configure to receive Ringer Setting.

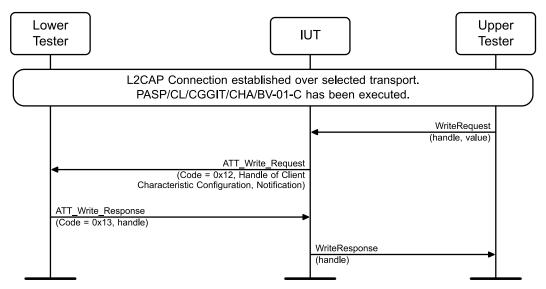


Figure 4.1: PASP/CL/PPCF/BV-01-C [Alert Status Characteristic Configuration, write with 0x0001] - MSC

Expected Outcome

Pass verdict

The IUT sends a correctly formatted ATT_Write_Request to the Lower Tester, containing the handle specified by the Upper Tester, and the value set to <0x0001, Notification>.

The IUT receives a correctly formatted ATT_Write_Response from the Lower Tester and sends the WriteResponse to the Upper Tester.



PASP/CL/PPCF/BV-03-C [Ringer Setting Characteristic Configuration, write with 0x0001]

Test Purpose

Verify that the Phone Alert Status Client IUT can configure the Client Characteristic Configuration of Ringer Setting in a Phone Alert Status Server.

Reference

[4] 4.8

- Initial Condition
 - A preamble procedure defined in Section 4.2 is used to set up the transport and L2CAP channel.
 - The Lower Tester includes one instantiation of the Phone Alert Status Service [7].
 - The IUT has executed PASP/CL/CGGIT/CHA/BV-02-C [Characteristic GGIT Ringer Setting], and has saved the handle of a Client Characteristic Configuration for Ringer Setting Characteristic.
- Test Procedure

The Upper Tester issues a command to the IUT to configure to receive Alert Status.

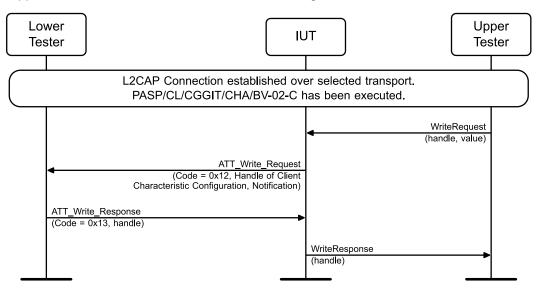


Figure 4.2: PASP/CL/PPCF/BV-03-C [Ringer Setting Characteristic Configuration, write with 0x0001] - MSC

Expected Outcome

Pass verdict

The IUT sends a correctly formatted ATT_Write_Request to the Lower Tester, containing the handle specified by the Upper Tester, and the value set to <0x0001, Notification>.

The IUT receives a correctly formatted ATT_Write_Response from the Lower Tester and sends the WriteResponse to the Upper Tester.



4.5 Write Features

Test Purpose

Verify Phone Alert Status Server IUT implementation of the Features defined in the Phone Alert Status Profile Specification [4] by a Phone Alert Status Server IUT, and usage of the same features by a Phone Alert Status Client IUT.

Verify that the Phone Alert Status Client IUT can write the Ringer Control Point characteristic in a Phone Alert Status Server.

Reference

[4] 4.9, 4.10

- Initial Condition
 - A preamble procedure defined in Section 4.2 is used to set up the transport and L2CAP channel.
 - The IUT has executed PASP/CL/CGGIT/CHA/BV-03-C [Characteristic GGIT Ringer Control Point], and has saved the handle of a Ringer Control Point characteristic.
 - IUT has executed PASP/CL/PPCF/BV-01-C [Alert Status Characteristic Configuration, write with 0x0001] or PASP/CL/PPCF/BV-03-C [Ringer Setting Characteristic Configuration, write with 0x0001] if needed.
- Test Case Configuration

Test Case	Value Requirements
PASP/CL/PPWF/BV-01-C [Ringer Control Point Characteristic, set to silent mode]	0x01
PASP/CL/PPWF/BV-02-C [Ringer Control Point Characteristic, mute a ringer once]	0x02
PASP/CL/PPWF/BV-03-C [Ringer Control Point Characteristic, set to release silent mode]	0x03

Table 4.3: Write Features test cases

- Test Procedure
 - 1. The Upper Tester issues a command to the IUT to write the value in Table 4.3 to the Ringer Control Point characteristic.
 - 2. The IUT sends an ATT_Write_Request command to the Lower Tester with the value specified in step 1 and the handle of the Ringer Control Point characteristic.

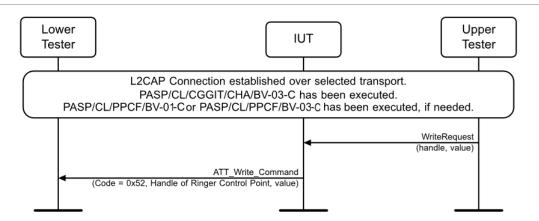


Figure 4.3: Write Features – MSC

Expected Outcome

Pass verdict

The characteristic value is successfully written according to Table 4.3 value requirements.

4.6 Notify Feature

Verify Phone Alert Status Server IUT implementation of the Features defined in the Phone Alert Status Profile Specification [4] by a Phone Alert Status Server IUT, and usage of the same features by a Phone Alert Status Client IUT.

PASP/CL/PPNF/BV-01-C [Alert Status Characteristic, Notify]

Test Purpose

Verify that the Phone Alert Status Client IUT can receive notification of the Alert Status characteristic in a Phone Alert Status Server.

Reference

[4] 4.4

- Initial Condition
 - A preamble procedure defined in Section 4.2 is used to set up the transport and L2CAP channel.
 - The Lower Tester includes one instantiation of the Phone Alert Status Service [7].
 - The IUT has executed PASP/CL/CGGIT/CHA/BV-01-C [Characteristic GGIT Alert Status], and has saved the handle of an Alert Status Characteristic.
 - The IUT has executed PASP/CL/PPCF/BV-01-C [Alert Status Characteristic Configuration, write with 0x0001] to expect Alert Status Notification.
- Test Procedure

The Lower Tester sends an ATT_Handle_Value_Notification containing an Alert Status characteristic value to the IUT.

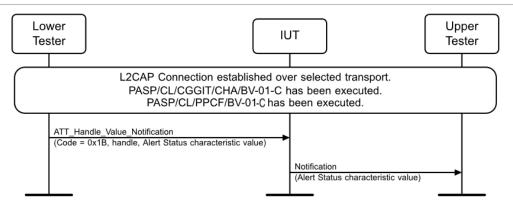


Figure 4.4: PASP/CL/PPNF/BV-01-C [Alert Status Characteristic, Notify] – MSC

Expected Outcome

Pass verdict

The IUT indicated the received Alert Status value to the Upper Tester, e.g. Notification (Alert Status value: 0x01, Ringer state active). The reported Alert Status value matches the one sent by the Lower Tester.

PASP/CL/PPNF/BV-02-C [Ringer Setting Characteristic, Notify]

Test Purpose

Verify that the Phone Alert Status Client IUT can receive notification of the Ringer Setting characteristic in a Phone Alert Status Server.

Reference

[4] 4.7

- Initial Condition
 - A preamble procedure defined in Section 4.2 is used to set up the transport and L2CAP channel.
 - The Lower Tester includes one instantiation of the Phone Alert Status Service [7].
 - The IUT has executed PASP/CL/CGGIT/CHA/BV-02-C [Characteristic GGIT Ringer Setting], and has saved the handle of a Ringer Setting characteristic.
 - The IUT has executed PASP/CL/PPCF/BV-03-C [Ringer Setting Characteristic Configuration, write with 0x0001] to expect Ringer Setting Notification.
- Test Procedure

The Lower Tester sends an ATT_Handle_Value_Notification containing a Ringer Setting characteristic value to the IUT.

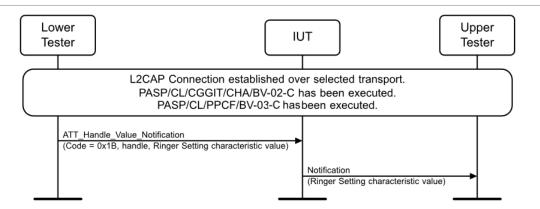


Figure 4.5: PASP/CL/PPNF/BV-02-C [Ringer Setting Characteristic, Notify] – MSC

Expected Outcome

Pass verdict

The IUT indicated the received Ringer Setting value to the Upper Tester, e.g. Notification (Ringer Setting value: 0x00, mute). The reported Ringer Setting value matches the one sent by the Lower Tester.

4.7 Phone Alert Status Client Behavior

Verify Phone Alert Status Server IUT implementation of the Features defined in the Phone Alert Status Profile Specification [4] by a Phone Alert Status Server IUT, and usage of the same features by a Phone Alert Status Client IUT.

PASP/CL/PPCB/BV-01-C [Read the Alert Status after Connection Setup]

Test Purpose

Verify that the Phone Alert Status Client IUT starts to read the Alert Status characteristic in a Phone Alert Status Server.

Reference

[4] 4.11

- Initial Condition
 - The Lower Tester and the IUT are disconnected.
- Test Procedure

The Lower Tester connects to the IUT and starts connection setup (including service discovery and service search).

Expected Outcome

Pass verdict

The IUT indicated reads the Alert Status characteristic in the Phone Alert Status server spontaneously.



4.8 **Connection Features**

Verify Phone Alert Status Server IUT implementation of the Features defined in the Phone Alert Status Profile Specification [4] by a Phone Alert Status Server IUT, and usage of the same features by a Phone Alert Status Client IUT.

4.8.1 Verify Bond Status on Reconnection

Test Purpose

Verify that the Central starts encryption with a previously bonded Peripheral on reconnection, and success.

Reference

[4] 5.2.3

- Initial Condition
 - The IUT and the Lower Tester are bonded.
 - No connection is established between the IUT and the Lower Tester.
- Test Case Configuration

Test Case	Role
PASP/CL/TPCN/BV-01-C	Client
PASP/SR/TPCN/BV-01-C	Server

Table 4.4: Connection Features test cases

- Test Procedure
 - 1. The Lower Tester begins advertising using GAP undirected connectable mode.
 - 2. The IUT establishes a connection to the Lower Tester.
 - 3. The IUT starts encryption when the connection is established.
- Expected Outcome

Pass verdict

The IUT starts encryption when the connection is established.

Encryption is successfully done.



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 Phone Alert Status Profile (PASP) [3].

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 [1].

ltem	Feature	Test Case(s)	
PASP 7/1 Discover Phone Alert Status Service		PASP/CL/CGGIT/SER/BV-01-C	
PASP 7/2 Alert Status characteristic		PASP/CL/CGGIT/CHA/BV-01-C	
PASP 7/4	Ringer Setting characteristic	PASP/CL/CGGIT/CHA/BV-02-C	
PASP 7/6	Ringer Control Point characteristic	PASP/CL/CGGIT/CHA/BV-03-C	
PASP 8/2	Alert Status characteristic configuration with 0x0001	PASP/CL/PPCF/BV-01-C	
PASP 8/3	Receive notification of Alert Status characteristic	PASP/CL/PPNF/BV-01-C	
PASP 8/5 Ringer Setting characteristic configuration with 0x0001		PASP/CL/PPCF/BV-03-C	
PASP 8/6	Receive notification of Ringer Setting characteristic	PASP/CL/PPNF/BV-02-C	
PASP 8/7	Ringer Control Point characteristic, write without response to 0x02	PASP/CL/PPWF/BV-02-C	
PASP 8/8	Read the Alert Status after connection setup	PASP/CL/PPCB/BV-01-C	
PASP 8/9 AND PASP 10/1	Verify Bond Status on Reconnection (Client IUT)	PASP/CL/TPCN/BV-01-C	
PASP 4/1 Verify Bond Status on Reconnection (Server IUT)		PASP/SR/TPCN/BV-01-C	
PASP 8/10	Ringer Control Point characteristic, write without response to 0x01	PASP/CL/PPWF/BV-01-C	
PASP 8/11 Ringer Control Point characteristic, write without response to 0x03		PASP/CL/PPWF/BV-03-C	

For the purpose and structure of the ICS/IXIT, refer to [1].

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0.0	2011-09-15	Adopted by the Bluetooth SIG Board of Directors
	1.0.1r0	2012-05-20	TSE 4628: TCMT update for TP/PPWF/PPC/BV-01-C and TP/PPWF/PPC/BV-03-C. Delete test cases TP/PPCF/PPC/BV-02-C and TP/PPCF/PPC/BV-04-C.
1	1.0.1	2012-07-24	Prepare for publication.
	1.0.2r1	2012-09-05	TSE 4928: Changed all test case IDs from –C to –I. TSE 4954: Corrected editorial error in TCMT, Changed TP/PPCP/PPC/BV-01-C to TP/PPCB/PPC/BV-01-C in PASP 8/8.
2	1.0.2	2012-10-30	Prepare for Publication
	1.0.3r00	2016-05-21	Converted to new Test Case ID conventions as defined in TSTO v4.1.
	1.0.3r01	2016-06-08	TS Template Conversion
	1.0.3r02	2016-06-13	Split Verify Bond Status test case by role into two test cases (PASP/CL/TPCN/BV-01-I and PASP/SR/TPCN/BV-01-I) following conversion to new test case ID conventions.
3	1.0.3	2016-07-14	Prepared for TCRL 2016-1 publication.
	1.0.3 edition 2r00	2018-11-29	Editorial changes only. Template updated. Revision History and contributors moved to the end of the document.
	1.0.3 edition 2	2020-01-08	Updated copyright page and confidentiality markings to support new Documentation Marking Requirements, performed minor formatting updates, and accepted all tracked changes to prepare for edition 2 publication.
	p4r00-r02	2023-05-04 – 2023-05-11	TSE 22812 (rating 2): Converted the following test cases to GGIT: PASP/CL/PPD/BV-01-I – -06-I and PASP/CL/PPRF/BV-01-I and -02-I. The new GGIT converted TCIDs are: PASP/CL/CGGIT/CHA/BV-01-C – -03-C and PASP/CL/CGGIT/SER/BV-01-C. Updated the TCMT accordingly. TSE 23149 (rating 1): Updated the TCMT and TCRL entries for PASP/CL/PPWF/BV-01-C – -03-C to account for the change from -I to -C in the test cases. Editorials to align the document with the latest TS template and DNMD, including setting the previous v1.0.3 as p3.
4	p4	2023-06-29	Approved by BTI on 2023-05-28. Prepared for TCRL 2023-1 publication.
	p5r00	2023-11-01	TSE 23280 (rating 1): Converted -I tests to -C tests as appropriate; updated the TCMT and TCRL accordingly.
5	р5	2024-07-01	Approved by BTI on 2024-04-21. Prepared for TCRL 2024-1 publication.

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