

Testing Guidelines for IoT Service Experience

Version 2.0

08 February 2021

This Industry Specification is a Non-binding Permanent Reference Document of the GSMA

Security Classification: Non-confidential

Access to and distribution of this document is restricted to the persons permitted by the security classification. This document is confidential to the Association and is subject to copyright protection. This document is to be used only for the purposes for which it has been supplied and information contained in it must not be disclosed or in any other way made available, in whole or in part, to persons other than those permitted under the security classification without the prior written approval of the Association.

Copyright Notice

Copyright © 2021 GSM Association

Disclaimer

The GSM Association ("Association") makes no representation, warranty or undertaking (express or implied) with respect to and does not accept any responsibility for, and hereby disclaims liability for the accuracy or completeness or timeliness of the information contained in this document. The information contained in this document may be subject to change without prior notice.

Antitrust Notice

The information contain herein is in full compliance with the GSM Association's antitrust compliance policy.

This GSMA Permanent Reference Document (PRD) is classified by GSMA as an Industry Specification, as such it has been developed and is maintained by GSMA in accordance with the provisions set out GSMA AA.35 - Procedures for Industry Specifications.

Table of Contents

1 Introduction 4
1.1 Overview 4
1.2 Scope 4
1.3 Definitions 4
1.4 Abbreviations 4
1.5 References 5
1.6 Conventions 5
2 Test Environment and Configuration 5
2.1 Test Set-up 5
2.2 Test Environment Selection 6
3 Test Cases 6
3.1 Service Procedure Test Cases 6
3.1.1 Registration 6
3.1.2 Status Reporting 7
3.1.3 Alarm Reporting 8
3.1.4 Error Reporting 8
3.1.5 Remote Configuration 8
3.1.6 Remote Upgrade 9
3.1.7 Data Synchronization 9
3.1.8 Generic Voice Call 11
3.1.9 Generic SMS 12
3.1.10 Emergency Service 13
3.2 Service Performance Test Cases 14
3.2.1 Network Access Capability in Different CE Level 14
3.2.2 Service Delay Performance 15
3.3 Battery Life Measurement Test Cases 15
3.4 OTA Performance Test Cases 15
4 Mapping of Test Cases to Requirements 16
4.1 Smart Smoke Detector 16
4.1.1 Service Procedure 16
4.1.2 Service Performance 16
4.1.3 Battery Life Measurement 16
4.1.4 OTA Performance 16
4.2 Smart Meters 16
4.2.1 Service Procedure 16
4.2.2 Service Performance 17
4.2.3 Battery Life Measurement 17
4.2.4 OTA Performance 17
4.3 Location Trackers 17
4.3.1 Service Procedure 17
4.3.2 Service Performance 17
4.3.3 Battery Life Measurement 17

4.3.4 OTA Performance 18
4.4 Smart Parking 18
4.4.1 Service Procedure 18
4.4.2 Service Performance 18
4.4.3 Battery Life Measurement 18
4.4.4 OTA Performance 18
4.5 Smart Watch 18
4.5.1 Kid’s Smart Watch 19
4.5.2 Sports Smart Watch 19
Annex A Document Management 2
A.1 Document History 2
A.2 Other Information 2

1 Introduction

1.1 Overview

When IoT devices and services are to be deployed on mobile networks, end to end service procedures and performance should be verified. IoT devices, if not being properly designed and fully tested for the real use scenario, may have poor performance and unsatisfactory service experience. Massive deployment of IoT devices which are defective or below standard quality lay a painful burden to the network, which may result in an increase of maintenance efforts and costs in a later phase.

The purpose of this document is to define a set of test cases for the verification of IoT devices according to service requirements detailed in GSMA PRD TS.50 [2].

1.2 Scope

This document gives guidelines for tests that should be performed on 3GPP-based IoT devices to ensure the service experience in the actual use scenario, and can serve as a basis for certification of IoT devices.

The test cases are defined to be performed on a live network or controlled operator lab environment against target network infrastructure, unless otherwise stated in the test configuration.

This document does not replicate any test cases that are currently defined within the GSMA PRDs IoT Device Connection Efficiency Test Book TS.35 [6] and MIoT Field and Lab Test Cases TS.40 [7]. The final subset of test cases to be executed will be the subject of discussion and agreement between the MNOs, Device Manufacturers, Service Providers and other related parties in respect of the various features and functionality.

1.3 Definitions

Term	Description
IoT Device	A device that has communication modules and allows objects to be accessed, sensed and/or controlled remotely across existing mobile networks.
IoT Service Platform	A service platform, hosted by the IoT service provider which communicates to an IoT device to provide an IoT service

1.4 Abbreviations

Term	Description
APP	Application
CE	Coverage Enhancement
DUT	Device Under Test
IoT	Internet of Things
MCL	Maximum Coupling Loss
NB-IoT	Narrow Band Internet of Things
OTA	Over The Air
PC	Personal Computer

Term	Description
PSM	Power Saving Mode
RSRP	Reference Signal Received Power
SINR	Signal to Interference plus Noise Ratio
TRP	Total Radiated Power
TRS	Total Radiated Sensitivity

1.5 References

Ref	Doc Number	Title
[1]	RFC 2119	“Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997. Available at http://www.ietf.org/rfc/rfc2119.txt
[2]	GSMA PRD TS.50	IoT Service Experience Guidelines
[3]	GSMA PRD TS.09	Battery Life Measurement and Current Consumption Technique
[4]	GSMA PRD TS.51	OTA Testing of IoT Device
[5]	RFC 8174	Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words
[6]	GSMA PRD TS.35	IoT Device Connection Efficiency Test Book
[7]	GSMA PRD TS.40	MIoT Field and Lab Test Cases

1.6 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 (RFC2119) [1] (RFC8174) [5] when, and only when, they appear in all capitals, as shown here.

2 Test Environment and Configuration

2.1 Test Set-up

Tests should be performed on a live network or controlled operator lab environment. Devices under test are recommended to be connected to a logging computer for problem analysis. An application shall be provided to assist in controlling and configuring IoT devices.



Figure 1: Framework of test in a live network

2.2 Test Environment Selection

Consider that IoT devices may be installed in complex radio environments, such as in corridors, indoors, or underground and have variable performances under different network conditions, the devices under test (DUT) should be tested both in normal and extreme network conditions.

The table below gives an example of test point selection principals for NB-IoT devices:

Test Point	RSRP	SINR
Good Coverage	RSRP>= -105 dBm	SINR >= 5 dB
Middle Coverage	-120 dBm =< RSRP < -105 dBm	0 dB =< SINR < 5 dB
Poor Coverage	RSRP< -120 dBm	SINR< 0 dB

Table 1: An example of test environment selection principal for NB-IoT devices

Test environment selection of NB-IoT devices can also reference the Coverage Level defined in 3GPP specifications.

- Normal Coverage: CE=0, MCL <144dB
- Robust Coverage: CE=1, 144dB< MCL <154dB
- Extreme Coverage: CE=2, 154dB< MCL <164dB

3 Test Cases

3.1 Service Procedure Test Cases

3.1.1 Registration

Test purpose

To verify that the DUT can successfully register on the IoT service platform and communicate for the first time when switching on.

Referenced Requirements

TS50_2.1.1_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered off and hasn't been registered to the IoT service platform

DUT is in a test location with good network coverage

Test procedure

	Test procedure	Expected behaviour
1	Power on DUT and confirm successful registration on the IoT service platform.	Check on the IoT service platform, DUT is successfully registered.
2	Trigger a data transfer on DUT, e.g. status report.	Check on the IoT service platform, data transfer is successfully received.

3.1.2 Status Reporting

3.1.2.1 Periodic Status Report

Test purpose

To verify that the DUT can periodically send status reports to the IoT service platform.

Referenced Requirements

TS50_2.1.2_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered off

DUT is in a test location with good network coverage

DUT is configured with a status reporting period less than 5 minutes

Timer value of T3324 is configured less than the status reporting period if the PSM mode is enabled on DUT

Test procedure

	Test procedure	Expected behaviour
1	Power on DUT and confirm successful registration on the IoT service platform.	DUT is successfully registered. If PSM mode is enabled on DUT, DUT enters into PSM upon the expiry of T3324.
2	Wait for a status reporting period.	DUT successfully sends status reporting to the IoT service platform with required information.

3.1.2.2 On-Demand Status Report

Test purpose

To verify that DUT can send a status report which is triggered by the IoT service platform.

Referenced Requirements

TS50_2.1.2_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered on and registered to the IoT service platform

DUT is in a test location with good network coverage

DUT is configured to send status report if triggered by the IoT service platform

Test procedure

	Test procedure	Expected behaviour
1	From IoT service platform, trigger a status report request to DUT.	DUT successfully sends status reporting to the IoT service platform with required information.

3.1.3 Alarm Reporting

Test purpose

To verify that the DUT can successfully trigger an alarm to the IoT service platform on the detection of an emergency.

Referenced Requirements

TS50_2.1.3_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered on and registered to the IoT service platform

DUT is in a test location with good network coverage

Test procedure

	Test procedure	Expected behaviour
1	Stimulate an emergency situation and trigger an alarm on DUT.	DUT successfully sends an alarm report to the IoT service platform with required information.

3.1.4 Error Reporting

Test purpose

To verify that the DUT can successfully trigger an error report to the IoT service platform on the detection of an abnormal working status (low battery, unexpected dismantling of device, etc) of the IoT device.

Referenced Requirements

TS50_2.1.4_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is in powered on and registered to the IoT service platform.

DUT is in a test location with good network coverage

Test procedure

	Test procedure	Expected behaviour
1	Stimulate an abnormal working situation and trigger an error message on DUT.	DUT successfully sends an error report to the IoT service platform with required information.

3.1.5 Remote Configuration

Test purpose

To verify that the DUT can successfully reconfigure the parameter as commanded by the IoT service platform.

Referenced Requirements

TS50_2.1.5_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is in powered on and registered to the IoT service platform.

DUT is in a test location with good network coverage

Test procedure

	Test procedure	Expected behaviour
1	Trigger an uplink data service on DUT, i.e. status reporting.	DUT successfully sends data to the IoT service platform.
2	Change configuration parameters (e.g. period of status reporting) for DUT on the IoT service platform or user app.	DUT successfully receives the configuration information and reconfigures parameters as commanded by the IoT service platform.
3	Check on DUT if the newly configured parameters take effect.	Reconfigured paramters take effect. (e.g. DUT sends status report as per new frequency)

3.1.6 Remote Upgrade

Test purpose

To verify that the DUT can successfully upgrade the firmware as commanded by the service platform.

Referenced Requirements

TS50_2.1.6_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is in powered off

DUT is in a test location with good network coverage

A new firmware version is available on the IoT service platform

Test procedure

	Test procedure	Expected behaviour
1	Power on DUT and confirm successful registration on the IoT service platform.	DUT is successfully registered.
2	Push firmware upgrade request to DUT on the IoT service platform.	DUT successfully receives the request and starts to upgrade the firmware version .
3	Verify DUT upgrade to the firmware version as commanded by the IoT service platform.	DUT was upgraded to the latest firmware version.

3.1.7 Data Synchronization

3.1.7.1 To A Different Device

Test purpose

To verify the DUT can synchronize personal data to a different device.

Referenced Requirements

TS50_2.6.2.1_REQ_5

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT and the different device are powered off.

Test procedure

	Test procedure	Expected behaviour
1	Activating the personal data synchronization function from a different device	The DUT is paired with a different device through cellular connection. Tapping the sync function from the application of the different device to launch personal data synchronization.
2	Synchronizing personal data to a different device	The personal data is transfer to a different device. The different device can display the recorded personal data after synchronization is completed.

3.1.7.2 To A Cloud Account

Test purpose

To verify the DUT can synchronize personal data to a cloud account.

Referenced Requirements

TS50_2.6.2.1_REQ_5

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off.

Test procedure test case

	Test procedure	Expected behaviour
1	Activating the personal data synchronization function from a cloud account	Ensure the DUT has connect to the cloud network via cellular network. Activating the sync function from the cloud account to launch personal data synchronization.
2	Synchronizing personal data to a cloud account	The personal data is transfer to a cloud account. The cloud account can display the recorded personal data after synchronization is completed.

3.1.8 Generic Voice Call

3.1.8.1 MO Voice Call

Test purpose

To verify that the DUT can perform generic 2-way voice communication.

Referenced Requirements

TS50_2.6.2.1_REQ_6

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off.

Contact list of the DUT is synced from a different personal device.

Test procedure

Depending on the network configuration please perform either test case No1 or No2

Test Case No 1

TS.11 Annex L 90.2.1.1 IMS for the IMS based voice call

Test Case No 2

TS.11 Annex C 34.1.1 E-UTRA for the CS fallback voice call

3.1.8.2 MT Voice Call

Test purpose

To verify that the DUT can perform generic 2-way voice communication.

Referenced Requirements

TS50_2.6.2.1_REQ_6

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off

Contact list of the DUT is synced from a different personal device

Test procedure

Depending on the network configuration please perform either test case No1 or No2

Test Case No 1

TS.11 Annex L 90.2.1.10 IMS for the IMS based voice call

Test Case No 2

TS.11 Annex C 34.1.4 E-UTRA for the CS fallback voice call

3.1.9 Generic SMS

3.1.9.1 MO SMS

Test purpose

To verify that the DUT can perform SMS function properly.

Referenced Requirements

TS50_2.6.2.1_REQ_7

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off.

Contact list of the DUT is synced from a different personal device.

Test procedure

Depending on the network configuration please perform either test case No1 or No2

Test Case No 1

TS.11 Annex L 90.3.1.1 IMS for the IMS based SMS

Test Case No 2

TS.11 Annex C 35.1.1 E-UTRA for the SMS over SGs

3.1.9.2 MT SMS

Test purpose

To verify that the DUT can perform SMS function properly.

Referenced Requirements

TS50_2.6.2.1_REQ_7

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off.

Contact list of the DUT is synced from a different personal device.

Test procedure

Depending on the network configuration please perform either test case No1 or No2

Test Case No 1

TS.11 Annex L 90.3.1.4 IMS for the IMS based SMS

Test Case No 2

TS.11 Annex C 35.1.2 E-UTRA for the SMS over SGs

3.1.10 Emergency Service

Test purpose

To verify that the DUT can perform emergency service properly.

Referenced Requirements

TS50_2.6.2.1_REQ_9

For additional REQ see mapping tables

Initial configuration

If the smartwatch is eSIM enabled, the eSIM subscription must be activated with mobile operator.

DUT is powered off.

Emergency number list is pre-configured into smartwatch.

Test procedure

Depending on the network configuration please perform either test case No1 or No2

Test Case No 1

TS.11 Annex L 91.2.3 IMS for the emergency call

Test Case No 2

TS.11 Annex C 34.2 E-UTRA for the CS fallback emergency call

3.2 Service Performance Test Cases

3.2.1 Network Access Capability in Different CE Level

Test purpose

To verify that the DUT can successfully access the network and register on the IoT service platform when switching it on in different network coverage levels.

Referenced Requirements

TS50_2.1.1_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered off

Test procedure

	Test procedure	Expected behaviour
1	Power on DUT and confirm successful registration on the IoT service platform.	Check on the IoT service platform, DUT is successfully registered. Record the time difference between switching on DUT and DUT's successful registration on the IoT service platform.
2	Repeat Step 1 for ten times under each coverage level	Record the DUT's registration success ratio under each coverage level. Calculate the average delay performance of registration in each coverage level

3.2.2 Service Delay Performance

Test purpose

To verify the service delay performance of the DUT in different network coverage levels. This test case is recommend to be tested for time critical services.

Referenced Requirements

TS50_2.1.3_REQ_1

For additional REQ see mapping tables.

Initial configuration

DUT is powered on and registered on the IoT service platform

Test procedure

	Test procedure	Expected behaviour
1	Trigger an uplink data service on DUT, e.g. alarm reporting.	Check on the IoT service platform the uplink data is successfully received. Record the time difference starting from triggering data transfer on DUT to the completion of data reception on the IoT service platform.
2	Repeat Step 1 for ten times under each coverage level	Calculate the average service delay performance in each coverage level and record the DUT's service success ratio under each coverage level.

3.3 Battery Life Measurement Test Cases

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3]

3.4 OTA Performance Test Cases

OTA performance testing SHALL be performed in an Anechoic Chamber or Reverberation Chamber. OTA performance test cases SHALL follow the test cases defined in GSMA PRD TS.51 [4].

4 Mapping of Test Cases to Requirements

4.1 Smart Smoke Detector

4.1.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.1.1_1	TS50_2.2.2_REQ_1	Please refer to 3.1.1	
TC_4.1.1_2	TS50_2.2.2_REQ_2	Please refer to 3.1.2.1	
TC_4.1.1_3	TS50_2.2.2_REQ_3	Please refer to 3.1.3	Alarm trigger condition: Detection of fire smoke
TC_4.1.1_4	TS50_2.2.2_REQ_4	Please refer to 3.1.4	
TC_4.1.1_5	TS50_2.2.2_REQ_5	Please refer to 3.1.5	
TC_4.1.1_6	TS50_2.2.2_REQ_6	Please refer to 3.1.6	

4.1.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.1.2_1	TS50_2.2.2_REQ_1	Please refer to 3.2.1	
TC_4.1.2_2	TS50_2.2.2_REQ_3	Please refer to 3.2.2	

4.1.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.1.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.1.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.1.4_2 (TRS)		Please refer to TS.51 Section 5	

4.2 Smart Meters

4.2.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.2.1_1	TS50_2.3.2_REQ_1	Please refer to 3.1.1	
TC_4.2.1_2	TS50_2.3.2_REQ_2	Please refer to 3.1.2.1	
TC_4.2.1_3	TS50_2.3.2_REQ_3	Please refer to 3.1.4	
TC_4.2.1_4	TS50_2.3.2_REQ_4	Please refer to 3.1.5	
TC_4.2.1_5	TS50_2.3.2_REQ_5	Please refer to 3.1.6	

4.2.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.2.2_1	TS50_2.3.2_REQ_1	Please refer to 3.2.1	
TC_4.2.2_2		Please refer to 3.2.2	

4.2.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.2.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.2.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.2.4_2 (TRS)		Please refer to TS.51 Section 5	

4.3 Location Trackers

4.3.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.3.1_1	TS50_2.4.2_REQ_1	Please refer to 3.1.1	
TC_4.3.1_2	TS50_2.4.2_REQ_2	Please refer to 3.1.2.1	Periodic status report
TC_4.3.1_3	TS50_2.4.2_REQ_3	Please refer to 3.1.2.2	On-demand status report
TC_4.3.1_4	TS50_2.4.2_REQ_4	Please refer to 3.1.3	Alarm trigger condition: keep the device out of geo-fence or deviate from the route
TC_4.3.1_5	TS50_2.4.2_REQ_5	Please refer to 3.1.4	Fault report
TC_4.3.1_6	TS50_2.4.2_REQ_6	Please refer to 3.1.5	Remote configuration
TC_4.3.1_7	TS50_2.4.2_REQ_7	Please refer to 3.1.6	Firmware upgrade

4.3.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.3.2_1	TS50_2.4.2_REQ_1	Please refer to 3.2.1	
TC_4.3.2_2	TS50_2.4.2_REQ_4	Please refer to 3.2.2	

4.3.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.3.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.3.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.3.4_2 (TRS)		Please refer to TS.51 Section 5	

4.4 Smart Parking

4.4.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.4.1_1	TS50_2.5.2_REQ_1	Please refer to 3.1.1	
TC_4.4.1_2	TS50_2.5.2_REQ_2	Please refer to 3.1.2.1	Status report
TC_4.4.1_3	TS50_2.5.2_REQ_3	Please refer to 3.1.4	Fault report
TC_4.4.1_4	TS50_2.5.2_REQ_4	Please refer to 3.1.5	Remote parameter configuration
TC_4.4.1_5	TS50_2.5.2_REQ_5	Please refer to 3.1.6	Firmware upgrade

4.4.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.4.2_1	TS50_2.5.2_REQ_1	Please refer to 3.2.1	
TC_4.4.2_2		Please refer to 3.2.2	

4.4.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.4.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.4.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.4.4_2 (TRS)		Please refer to TS.51 Section 5	

4.5 Smart Watch

Various add-on functions were created but here this section remains focus on IoT communication based service experiences.

4.5.1 Kid's Smart Watch

4.5.1.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.1.1_1	TS50_2.6.2.1_REQ_1	Please refer to 3.1.1	Attach and registration
TC_4.5.1.1_2	TS50_2.6.2.1_REQ_5	Please refer to 3.1.7	Data synchronization
TC_4.5.1.1_3	TS50_2.6.2.1_REQ_6	Please refer to 3.1.8	Generic voice communication
TC_4.5.1.1_4	TS50_2.6.2.1_REQ_7	Please refer to 3.1.9	Generic SMS
TC_4.5.1.1_5	TS50_2.6.2.1_REQ_8	Please refer to 3.1.2.2	On-demand location status report
TC_4.5.1.1_6	TS50_2.6.2.1_REQ_9	Please refer to 3.1.10	Emergency services
TC_4.5.1.1_7	TS50_2.6.2.1_REQ_10	Please refer to 3.1.6	Firmware upgrade

4.5.1.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.1.2_1	TS50_2.6.2.1_REQ_1	Please refer to 3.2.1	
TC_4.5.1.2_2	TS50_2.6.2.1_REQ_2	Please refer to 3.2.2	

4.5.1.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.5.1.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.1.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.5.1.4_2 (TRS)		Please refer to TS.51 Section 5	

4.5.2 Sports Smart Watch

4.5.2.1 Service Procedure

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.2.1_1	TS50_2.6.2.2_REQ_1	Please refer to 3.1.1	Attach and registration
TC_4.5.2.1_2	TS50_2.6.2.2_REQ_6	Please refer to 3.1.7	Data synchronization
TC_4.5.2.1_3	TS50_2.6.2.2_REQ_7	Please refer to 3.1.8	Generic voice communication
TC_4.5.2.1_4	TS50_2.6.2.2_REQ_8	Please refer to 3.1.9	Generic SMS
TC_4.5.2.1_5	TS50_2.6.2.1_REQ_9	Please refer to 3.1.10	Emergency services

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.2.1_6	TS50_2.6.2.1_REQ_11	Please refer to 3.1.6	Firmware upgrade

4.5.2.2 Service Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.2.2_1	TS50_2.6.2.2_REQ_1	Please refer to 3.2.1	
TC_4.5.2.2_2	TS50_2.6.2.2_REQ_2	Please refer to 3.2.2	

4.5.2.3 Battery Life Measurement

Battery life measurement test cases SHALL follow the test cases defined in GSMA PRD TS.09 [3].

4.5.2.4 OTA Performance

TC Number	Requirement ID	Test Cases	Comments
TC_4.5.2.4_1 (TRP)		Please refer to TS.51 Section 4	
TC_4.5.2.4_2 (TRS)		Please refer to TS.51 Section 5	

Annex A Document Management

A.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	March 2020	New PRD TS.52	TSG#38 TG#20	Ya Liu / China Mobile
2.0	Feb 2021	Implementing changes in TS.52 CR1002	TSG#42 ISAG#6	Ya Liu / China Mobile Indy Peng / Mediatek Kay Fritz / Vodafone

A.2 Other Information

Type	Description
Document Owner	GSMA Terminal Steering Group (TSG)
Editor / Company	Ya Liu / China Mobile

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at prd@gsma.com

Your comments or suggestions & questions are always welcome.