



Permanent Reference Document NAPRD03

Version Specific Technical Overview of PTCRB Certification Program

Version 6.6

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Section 1 Introduction

1.1 Purpose

The purpose of this Permanent Reference Document (PRD) is to provide version specific technical framework within which GERAN, UTRA, E-UTRA, and NR device certification can take place.

Refer to the latest version of the PTCRB Program Management Document (PPMD) for the process requirements.

Section 2 Wireless Device Certification Test Requirements

2.1 Scope

This section of NAPRD03 specifies a common approach to the certification testing of GSM/UTRA/E-UTRA/NR wireless devices (referred to as “Devices” throughout this document).

The intent of this document is to define the criteria such that certification testing of Devices may be performed on a consistent basis. This document is maintained by the PTCRB Working Group within CTIA Certification LLC and is updated on a quarterly basis.

2.2 Introduction

This document is intended to advise PTCRB authorized test laboratories (known as CTIA Certification Authorized Test Labs or ATLS) concerning the establishment of Device conformity with the reference specifications below. Information is presented to clearly identify which conformance requirements may be evaluated using the reference test system configuration as defined in the PTCRB TC (Test Case) Database and which conformance requirements may be evaluated using other defined methods or equipment.

The PTCRB Test Case (TC) Database includes a concise report of the technical status of the reference certification test equipment implementation. Where necessary, additional information may be presented to enable tests to be performed and the results of tests to be interpreted in a harmonized manner. TC Database provides a separate listing of the test cases. The PTCRB TC Database shall be used as the primary reference for the actual test cases and applicable categories.

2.3 Reference Specifications

2.3.1 GSM:

- [1] 3GPP TS 51.010 (formerly GSM 11.10)
- [2] 3GPP TS 51.010-4.

2.3.2 UTRA:

- [3] 3GPP TS 34.121
- [4] 3GPP TS 34.123
- [5] 3GPP TS 31.121 (USIM)
- [6] 3GPP TS 31.124 (USAT)
- [7] 3GPPTS 26.132 (Audio)
- [8] 3GPP TS 34.108
- [9] ETSI TS 102 230 (UICC)
- [10] ETSI TS 102 384 (UICC)
- [11] 3GPP TS 34.124 (RSE)

2.3.3 E-UTRA:

- [20] 3GPP TS 36.521
- [21] 3GPP TS 36.523
- [22] 3GPP TS 36.124
- [23] 3GPP TS 36.508
- [24] 3GPP TS 31.121 (USIM)
- [25] 3GPP TS 31.124 (USAT)

2.3.4 NR:

- [30] 3GPP TS 38.124
- [31] 3GPP TS 38.521
- [32] 3GPP TS 38.523
- [33] 3GPP TS 38.508
- [34] 3GPP TS 38.533
- [35] 3GPP TS 31.121 (USIM)
- [36] 3GPP TS 31.124 (USAT)

2.3.5 LTE Data Throughput:

- [50] 3GPP TR 37.901

2.3.6 NFC:

- [60] ETSI TS 102 694 (SWP)
- [61] ETSI TS 102 695 (HCI)
- [62] GSMA PRD TS.27

2.3.7 Positioning:

- [80] 3GPP TS 34.171
- [81] 3GPP TS 37.571

Positioning Exceptions tables moved to PVG.05

2.3.8 Cybersecurity Evaluation:

[100] *CTIA Cybersecurity Certification Test Plan for IoT Devices*

Note 1: In the case of UTRA A-GNSS test cases (3GPP TS 34.171 5.x and 3GPP TS 34.123-1 17.x), the requirements have been moved to 3GPP TS 37.571-1 and 3GPP TS 37.571-2 respectively. Cross reference information has been added to 3GPP TS 34.123-1 and 3GPP TS 34.171 detailing the mapping of test cases to the new specifications.

Note 2: PTCRB accepts the 3GPP applicability for test cases defined in 3GPP TS 51.010-1/2 and 37.571-1/3 with the following exceptions

2.3.9 Device RF Performance Evaluation:

[101] *CTIA Certification Test Plan for Wireless Device Over-the-Air Performance, Version 3.8.2 or later*

[102] *CTIA Certification Test Plan for 2X2 Downlink MIMO and Transmit Diversity Over-the-Air Performance, Version 1.2 or later*

Found at <https://ctiacertification.org/test-plans/>

2.3.10 Wi-Fi RF Performance Evaluation:

[103] *CTIA Certification/Wi-Fi Alliance Test Plan for RF Performance Evaluation of Wi-Fi Mobile Converged Devices, Version 2.1 or later*

Found at <https://ctiacertification.org/test-plans/>

2.3.11 Void:

2.3.12 OMA SUPL 1.0, 2.0:

[121] OMA-ETS-SUPL-V1_0

[122] OMA-ETS-SUPL-V2_0

2.3.13 IMS:

[130] 3GPP TS 34.229

2.3.14 OMA DM 1.2:

[140] OMA-ETS-DMV1_2

2.3.15 TTY:

[150] *PTCRB Bearer-Agnostic TTY Test Specification, Version 2.0*

[151] *2G TTY Test Specification, Rev. 4.31*

[152] *TTY 3G Test Specification, Rev. 2.0*

Note 3: For clarification, test cases from PTCRB Bearer-Agnostic TTY Test Specification shall be performed for PTCRB certification instead of executing test cases from the 2G TTY Test Specification and/or TTY 3G Test Specification listed above.

Test case applicability as per PTCRB Bearer-Agnostic TTY Test Specification Section 8 shall apply.

2.3.16 A-GNSS Radiated Performance:

[101] *CTIA Certification Test Plan for Wireless Device Over-the-Air Performance*

2.3.17 AT-Commands:

[153] *PTCRB Bearer Agnostic AT-Command Test Specification* (latest version)

2.3.18 OMA FUMO 1.0:

[160] OMA ETS FUMO V1.0

2.3.19 Connection Efficiency:

[170] GSMA PRD TS.35

2.3.20 Remote SIM Provisioning:

[171] GSMA PRD SGP.23

2.3.21 PTCRB Validation Group (PVG) Permanent Reference Documents:

[202] PVG.02: *“Terms of Reference and Working Procedures”*

[203] PVG.03: *“Evolution Tracking of PTCRB Certification Test Cases and Requirements”*

[204] PVG.04: *“Guideline for Radiated Spurious Emission Testing”*

[205] PVG.05: *“Guideline for Test Case Redundancy and Relaxations”*

[206] PVG.06: *“Frequently Asked Questions (FAQ)”*

[207] PVG.07: *“Recommended Test Case List for PTCRB Inter-Laboratory Comparison Testing”*

[208] PVG.08: *“AT Command Assessment Guideline”*

[209] PVG.09: *“Guideline for LTE Data Throughput Testing Verification”*

[210] PVG.10: *“Guideline for Testing of Devices with Multi-SIM/ (USIM)”*

[211] PVG.11: *“Overview of Required NR & LTE Frequency Bands, Inter-Band and Inter-RAT Combinations, LTE Carrier Aggregation Combinations, NR Carrier Aggregation Combinations and EN-DC Combinations”*

[212] PVG.12: *“Process on How to Deal with Test Failures During Certification”*

2.3.22 General Notes:

Note 4: The core specification citations from 3GPP, OMA, and other Standards Bodies referenced in this document, represent the definitive specification(s) for expected DUT behavior as applicable.

For protocol tests, where 3GPP or OMA have developed TTCN, the official TTCN represents the definitive specification(s) for test cases utilizing this scripting language. Other protocol test implementations are allowed if they are based on prose for which there is a corresponding 3GPP or OMA specification.

In the event of conflicting results between test platforms, equipment using TTCN developed by 3GPP or OMA if available, represents the correct implementation until proven otherwise.

2.4 Participating Organizations

Technical validation of the test systems included in this document has been conducted by the PTCRB Validation Group (PVG). A list of members can be obtained from document PVG.02.

2.5 List of Tests for Accredited Testing

The PTCRB TC Database shows the status of validated tests approved for certification testing. Where a variation or specific interpretation of a test specification or test method is required by the PTCRB Primary Test Laboratory, this will be recorded in the PTCRB TC Database.

2.6 Document Amendments

Any amendment proposals shall be submitted as a contribution to the PTCRB Working Group.

2.7 Data Fields Used by the PTCRB Test Case (TC) Database

2.7.1 Test Specification Field

A document defining the test approach for a feature or combination of features, and the initial conditions execution conditions, and the pass/fail criteria for the related tests.

2.7.2 Parameter Value Field

Test case as defined in the associated test specification. Note: When the test case utilized multiple bands, such as tests pertaining to LTE Carrier Aggregation, NR Dual-Connectivity, NR Carrier Aggregation, LTE EN-DC, etc. the specific bands to be tested are denoted in a 3GPP-standardized band combination. The 3GPP-standardized band configuration is contained within square brackets.

TABLE 2.7-1 PTCRB TC DATABASE PARAMETER FIELD NAMING RULES

Technology	Test Case Parameter: Example Allowed Values	Comment
NR FR1 Bands	n2	Numeric values for the bands shall be used with a leading lower-case "n" prior to the band number and without any leading zeros.
NR FR2 Bands	n258	Numeric values for the bands shall be used with a leading lower-case "n" prior to the band number.
E-UTRA bands	FDD17	Numeric values for the bands shall be used without any leading zeros.
	FDD4	
	TDD41	
UTRA bands	FDDII	Roman numerals shall be used to differentiate between UTRA & E-UTRA.
	FDDV	

Technology	Test Case Parameter: Example Allowed Values	Comment
	FDDI	
GERAN bands	1900	The GSM bands with no qualification before or after the actual band definition. Note that the multi-band GSM tests are not qualified.
	850	

2.7.3 Description Field

Test case description as defined in the associated test specification.

2.7.4 RFT (Request For Test) Field

An RFT is a request by the PTCRB Working Group to include test cases for a specific band, band combination, feature and/or function. The “RFT indication” field in the PTCRB TC Database shows the association between any given test case and its associated RFT. All RFTs are maintained in PTCRB PVG.03 and in the RFT portion of the PTCRB TCDB.

2.7.5 Test Platform Fields

Each validated test platform shall have an associated Test Platform (TP) number, the relationship for which is maintained in the PTCRB TCDB in the fields labeled “V”, “E” or “D”, as described below:

2.7.5.1 Validation Status Information:

V (Validated): A Test Platform having fully fulfilled the validation criteria complying with the latest version(s) of the test specification(s).

E (Exception): A Test Platform partially fulfilling the validation criteria and/or just partially complying to the latest version(s) of the test specification(s).

D (Downgrade): A Test Platform that has been downgraded and is currently not recommended to be used for certification testing process.

2.7.6 Category Field (PTCRB Test Case Category)

The following test case categories shall be used

TABLE 2.7-2 PTCRB TEST CASE CATEGORY FIELD DEFINITIONS

Category "A"	Test case is fully validated, and available in PTCRB authorized test laboratories
Category "B"	Test case is available in PTCRB authorized test laboratories with exceptions

Category "C"	Reserved category
Category "D"	Test case is downgraded and is not a certification requirement
Category "E"	Test case is validated, and results are provided in the certification test report. Failure of DUT to pass test case will not prevent its certification.
Category "N"	Not applicable (all versions of NAPRD03)
Category "S"	Not applicable for this version and all later NAPRD03 versions (e.g. execution of this test is suspended). This test case may be applicable for previous NAPRD03 versions.
Category "P"	New test case not yet validated or a test case that has been downgraded for more than 45 days.

2.7.6.1 Category "A"

TABLE 2.7-3 CATEGORY "A" DEFINITION

Definition of this category:
Device conformance is tested by a PTCRB authorized test laboratory as indicated in the "tested band" column. Conformity of the DUT is demonstrated in a PTCRB authorized test laboratory using validated test programs on appropriate test equipment reference configuration listed in TC Database.
Interoperability testing:
This test purpose is tested according to Section 3.2 of this document.
This category is used for:
All test purposes covered by validated Means of Test or a defined interoperability methodology
Test case result:
A Category A test case shall be passed for the DUT to obtain PTCRB certification. See the guidelines of PVG.12 for the process on how to deal with test case failures during certification.

2.7.6.2 Category "B"

TABLE 2.7-4 CATEGORY "B" DEFINITION

Definition of this category:
Device conformance is tested to the extent possible by a PTCRB authorized test laboratory as indicated in the "tested band" column. Conformity of the DUT is demonstrated to the extent possible in a PTCRB authorized test laboratory using validated test programs on an appropriate test equipment reference configuration listed in TC Database.
This category is used for:
a) Means of Test where test purposes are not fully tested, because parts of the Means of Test are incorrect and therefore not valid for accredited testing.
b) Means of Test where a "PASS" verdict is a valid verdict, but a "FAIL" verdict may not be valid.
c) Means of Test not validated for a special DUT configuration.
Example:
1) Parts of a Means of Test are validated because some sections of the test program are faulty and therefore the referenced test purpose might be partly covered, or other referenced test purposes are not covered at all.
2) A Means of Test is running up to a specific test section where more than one correct DUT behavior would be possible but only one specific behavior is allowed by the test program and therefore it might unfairly "FAIL" in this section.
3) A Method of Test is written for TCH/S DUT and DATA-only DUT, but the test can be performed for TCH/S DUT only.
Test case result:
A Category "B" test case shall be passed for the DUT to obtain PTCRB certification, with exception to certain cases. See the guidelines of PVG.12 for the process on how to deal with test case failures during certification.

2.7.6.3 Category "D"

TABLE 2.7-5 CATEGORY "D" DEFINITION

Definition of this category:
<p>The test has previously been in category "A", "B" or "E" but has been "downgraded" due to an issue with the test case implementation, test platform and/or test specification and there are no valid Means of Test available.</p> <p>Unless the test case issue is resolved and the test case re-validated within 45 days of approval of the test case downgrade, the test case will revert to Category "P" (45-day rule). The date, time and rationale for each Category D downgrade shall be documented.</p>
This category is used for:
<p>An indication that a test case was earlier a certification requirement but has been downgraded due to an issue with the test case; the test case can be revalidated by application of the "5 day rule" and immediately be re-introduced as a certification requirement.</p>
Example:
<p>A PTCRB authorized test laboratory has found an issue with a test case implementation that means the test case cannot be used for certification testing. The PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory has raised a change request by application of the "5-day rule" explaining the issue and proposing to downgrade the test case. On approval of the 5 day rule the test case category is changed to "D" indicating the test case has been downgraded and is no longer a certification requirement. If the test case is not corrected and re-validated with 45 days, it will revert to Category "S" and be treated as though a suspended test case with no current valid means of test.</p>
Test case result:
<p>A Category "D" test case is not executed.</p>

2.7.6.4 Category "E"

TABLE 2.7-6 CATEGORY "E" DEFINITION

Definition of this category:
<p>Tests that have been validated but are under evaluation are allocated to Category "E". Category "E" tests shall be performed by a PTCRB authorized test laboratory on DUTs as indicated in the "tested band" column; the results of which will not gate issuance of an IMEI. The results of these tests shall be presented as part of the certification test results. The results shall also include comments pertaining to the reason of any failures experienced within a Category "E" test case. This shall include whether the test case is believed to be at fault and an indication that the test equipment manufacturer has been contacted. If it is believed to be a DUT failure, the comment shall include what type of error was indicated by the test equipment.</p> <p>Where a Category "E" test case has failed on a previous certification of the DUT or is leveraging results from a related DUT (i.e., Parent, Module), if changes have been made to the DUT which may alter the result of the test case, the test shall be re-run for the subsequent certifications.</p> <p>Where a Category "E" test case has failed due to a fault of the test implementation on a previous certification of the DUT or is leveraging results from a related DUT (i.e., Parent, Module), if changes have been made to the test implementation, the test shall be re-run for the subsequent certifications.</p> <p>Interoperability tests may be executed by the manufacturer as defined in Section 3.2 of this document.</p>
This category is used for:
<p>Test for features that were new or not supported by all operators, will also include recently validated tests prior to being moved to Category "A".</p>
Example:
<p>Tests that have been validated but have not been moved to Category "A" such as new GPRS test cases or features not supported by all operators such as PBCCH or NMO I</p>
Test case result:
<p>A Category "E" test case shall be executed. However, a Pass result is not required for the Device to obtain PTCRB certification.</p> <p>See the guidelines of PVG.12 for the process on how to deal with test case failures during certification.</p>

Addition of Tests to Category "E"

A PTCRB Working Group member may request inclusion of a specific test in Category "E". The PTCRB Operator Steering Group shall review the test and if approved by the group, the test is moved to Category "E". All new tests submitted by the PVG will initially become Category "E".

Moving Tests from Category "E" to Any Other Category:

A PTCRB Working Group member may request the movement of a specific test from Category "E" into another Category ("A", "B"). Alternatively, the test may be removed. The PTCRB Operator Steering Group shall review the change request proposal. If the change request proposal is approved by the group, the test will change to the proposed category.

2.7.6.5 Category "N"

TABLE 2.7-7 CATEGORY "N" DEFINITION

Definition of this category:
This listed test does not require any testing nor declaration for all NAPRD03 versions
This category is used for:
Test execution not required
Example:
Band specific tests required testing in 1900 but not required in 850.
Test case result:
A Category "N" test case is not executed.

2.7.6.6 Category "S"

TABLE 2.7-8 CATEGORY "S" DEFINITION

Definition of this category:
This listed test does not require any testing nor declaration for this version and all later NAPRD03 versions. This test case may be applicable for previous NAPRD03 versions.
This category is used for:
Test execution not required for this version and all later NAPRD03 versions. It may be required to execute this test case for previous NAPRD03 versions.
Example:
A test case has been suspended and replaced by a re-defined test case.
Test case result:
A Category "S" test case is not executed for this version and all later NAPRD03 versions.

2.7.6.7 Category “P”

TABLE 2.7-9 CATEGORY “P” DEFINITION

Definition of this category:
Tests which have been specified by an RFT and have never been validated on commercially available test equipment. Validation reports shall be submitted to PVG meetings for PTCRB approval, and test cases can only change to category “E” in a new version of NAPRD03 as defined above.
This category is used for:
Instances where no test solution has ever been available. Note: Beginning with NAPRD.03 V 6.2, test cases that were, at one time, validated but were subsequently downgraded are no longer moved to Category P after expiry of the 45-day rule, but are moved to Category S instead.
Test case result:
A Category “P” test case is not executed.

2.7.7 Technology Area Field

This identifies the technology area of the test case. This is primarily used to determine capabilities of a PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory.

2.7.8 TC Cluster Field

This field identifies clusters (groupings) of test cases for transfer validation purposes.

2.7.9 Test Case Classifications

2.7.9.1 Bearer Agnostic

A test case which is independent of the radio access bearer or frequency band used during the test (typically used for Application Enablers).

2.7.9.2 Band Independent

The performance of test cases is not influenced by the bearer band used for the test scenario. The test case can be performed with any PTCRB bearer band within a radio technology, supported by the DUT.

2.7.9.3 Network Independent

A test case which is validated without the use of a radio access bearer (e.g., SIM interface specific tests).

2.7.9.4 Bearer Band

A test case that has been validated for specific frequency bands and/or technology (e.g., GSM1900, FDD2).

2.7.10 Test Case Sub-Classifications for all “Bearer Band” Tests

Bearer to be Tested: Defines the radio access bearer(s) and band(s) in which the Device shall be tested.

“*Single*” indicates that the applicable test case (e.g., protocol testing) shall be tested in a single PTCRB Band

“*FR Single*” indicates that the applicable 5G NR test case (e.g., protocol testing) shall be tested in a single PTCRB NR FR1 Band and a single NR FR2 Band supported.

“*NR Single prio*” indicates that the applicable test case shall be tested in a single PTCRB NR Band with an execution priority order to be followed as described in Table.2.7.10-1 below

Table 2.7.10-1, EN and NR Single Prio Band Hierarchy

<p><i>EN Single prio</i> (EN-BI)</p>	<p>Priority 1: DC_5A_n66A Priority 2: DC_66A_n78A Priority 3: DC_12A_n66A Priority 4: Any EN-DC band combo supported by the DUT manufacturer for which validated EN-BI tests are available</p>
<p><i>NR Single prio</i> (NR-BI)</p>	<p>Priority 1: NR n66 Priority 2: NR n71 Priority 3: NR n2</p>

Note: Inter-band test cases shall be tested if the frequency band combinations are supported by the mobile.

“*All*” indicates that the mobile shall be tested in all PTCRB Bands. Section 2.8 of this document identifies PTCRB Bands. Test cases defined for GCF Bands shall be executed as indicated within the applicable GCF-CC. Bands identified by both PTCRB and GCF are defined as PTCRB Bands and shall be executed according to the PTCRB rules. Inter-RAT test cases shall be tested in all frequency band combinations supported by the Device.

Test cases defined for GCF Bands shall comply with the category assigned by GCF-CC. Therefore, compliance shall be ensured for all category “A” test cases.

“*I-RAT Single*” – indicates an Inter-RAT test case that shall be tested in a single band combination. Inter-RAT test cases are split into separate test case parts for each possible band combination. Inter-RAT test cases shall be tested in PTCRB Bands.

“*multi*” – indicates that a band combination is required, e.g., GSM1900/850 MHz bands.

Blank – indicates that the test does not require a bearer

“*RAT All*” indicates that the applicable test case shall be tested once in each supported RAT and in PTCRB Bands.

“*TS Rule*” indicates that the applicable test case has specific execution requirements as detailed in the relevant test specification.

Where test cases have been identified as redundant between UTRA and GSM, or where a mixture of test capabilities for UTRA and GSM band support exist, testing shall be performed according to the following rules:

If UTRA FDD is supported by the Device and the test case in question has been validated for FDD Band II or V, then execute the test in one of these UTRA-FDD PTCRB Bands. Note: For instances in which the test case is only available in bands supported by GCF-CC, execution of the test in a GCF-CC UTRA band is preferred over GCF-CC GERAN.

If UTRA FDD is not supported by the Device but GSM1900 or GSM850 is supported by the Device and the test case in question has been validated for GSM1900 or GSM850, then execute the test in one these GERAN PTCRB Bands.

2.7.11 Special Rules and Exceptions:

Audio testing shall be performed according to the rules as defined in Section 2.9.6 of this document.

Conducted or RSE GCF Certification test results for GCF Bands will be recognized as a substitute for PTCRB conducted or RSE test results in the GCF bands, provided the GCF laboratory executing the tests is, at a minimum, an active observing member of the PVG. Otherwise, GCF Band conducted or RSE test cases shall be performed in a PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory as delegated by the PTCRB Primary Test Laboratory. The PTCRB Primary Test Laboratory will be responsible for uploading the GCF Certification test results to the PTCRB certification database along with their own test results.

Application enabler tests are not bearer dependent and can be performed in any frequency band supported by the Device.

If the primary PTCRB band tested on the certified Parent Device is disabled for any technology on the Variant Device, results for all “single” and “I-RAT single” band test cases from the Parent Device can be re-used on the Variant Device for certification.

If primary band test cases were executed according to GCF-CC only in any technology on the Parent Device, then testing of all “single” and “I-RAT single” band test cases shall be executed on the Variant Device if a PTCRB band is enabled, even if the band tested according to GCF-CC is still enabled.

For bearer-agnostic testing refer to NAPRD section “*Application Enabler (AE) Test Applicability*”.

2.8 PTCRB Bands

The following subsets of 3GPP-defined bands and band combinations have been identified as PTCRB Bands in this and all other PTCRB documents:

TABLE 2.8-1 PTCRB GERAN FREQUENCY BANDS

850 MHz
1900 MHz

TABLE 2.8-2 PTCRB UTRA FREQUENCY BANDS

Band II
Band V

TABLE 2.8-3 PTCRB E-UTRA FREQUENCY BANDS

FDD	TDD
Band 2	Band 41
Band 4	Band 42
Band 5	Band 43
Band 7	Band 48
Band 12	
Band 13	
Band 14	
Band 17	
Band 25	
Band 26	
Band 30	
Band 66	
Band 71	
Band 85	

TABLE 2.8-4.1 PTCRB 5G NR FR1 STAND-ALONE (SA) FREQUENCY BANDS

FDD	TDD
Band n2	Band n38
Band n5	Band n41
Band n7	Band n48
Band n12	Band n77
Band n14	Band n78
Band n25	
Band n26	
Band n29	
Band n30	
Band n66	
Band n70	
Band n71	

TABLE 2.8-5.2 PTCRB 5G NR FR1 NON-STAND-ALONE (NSA) FREQUENCY BANDS

FDD	TDD
Band n2	Band n38
Band n5	Band n41
Band n7	Band n77
Band n12	Band n78
Band n25	
Band n30	
Band n66	
Band n71	

TABLE 2.8-4.3 PTCRB 5G NR FR2 STAND-ALONE (SA) FREQUENCY BANDS

TDD

TABLE 2.8-4.4 PTCRB 5G NR FR2 NON-STAND-ALONE (NSA) FREQUENCY BANDS

TDD
Band n257
Band n258
Band n260
Band n261

The further information of PTCRB certification bands and/or supporting Operator(s) information shall refer to latest version of PTCRB Validation Group (PVG) Permanent Reference Documents [211] PVG.11.

2.9 RF Performance Evaluation

The RF Performance Evaluation is a mandatory requirement for all Device Types going through PTCRB Certification (the Category Field in the PTCRB TCDB is informative only.) Device assessment requirement shall be based on sub-clause 2.9.1 below.

2.9.1 RF Performance Test Plan

The test plan to be utilized for the evaluation of RF Performance for GSM, GPRS, EGPRS, UMTS and LTE Devices is the version of “*CTIA Certification Test Plan for Wireless Device Over-the-Air Performance*” [101] in effect at the time the request is submitted to the PTCRB certification database. The latest version of the test plan can be downloaded from CTIA Certification’s web site at <https://ctiacertification.org/test-plans/>. A listing of CTIA Certification Authorized Test Labs (ATLs) capable of conducting the testing described in [1] can be found on the same web site (under OTA Performance authorized testing capability).

Devices supporting the following bands shall be tested for RF performance as part of PTCRB certification:

- GSM/GPRS/EGPRS 850
- GSM/GPRS/EGPRS 1900
- UMTS Band II
- UMTS Band V
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13

- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 48
- LTE Band 66
- LTE Band 71

If the Device supports 802.11x (Note: the Wi-Fi feature checkbox shall be checked in the PTCRB certification database), the Device shall also be tested to the CTIA Certification/Wi-Fi Alliance Test Plan for RF Performance Evaluation of Wi-Fi Mobile Converged Devices (CWG Test Plan) subject to the RF Performance Test Applicability defined in Section 2.9.2 of this document. Notebooks and Tablets are exempt from testing to the CWG Test Plan. Until an M2M OTA methodology is codified and made mandatory for ATs, M2M Devices are exempt from testing to Version 2.1 of the CWG Test Plan and subsequent releases. The latest version of this test plan can be downloaded from CTIA Certification's web site at <https://ctiacertification.org/test-plans/>. A listing of labs authorized to conduct this testing can be found on the same web site (under Converged Device authorized testing capability).

If the Device supports GNSS or A-GNSS (Note: the GNSS or A-GNSS feature checkbox shall be checked in the PTCRB certification database), it shall be tested according to the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance. The latest version of this test plan can be downloaded from CTIA Certification's web site <https://ctiacertification.org/test-plans/>. A listing of labs authorized to conduct this testing can be found on the same web site (under OTA Performance authorized testing capability). A-GNSS tests may include the optional System Information Broadcast (SIB) messages SIB8 and/or SIB16 according to the requirements of the Device's target operator(s). Prior to lab submission, Device manufacturers shall contact the target operator(s) for operator requirements on A-GNSS testing with SIB8 and/or SIB16, and then make the appropriate declaration in their lab submission with respect to A-GNSS testing with SIB8 and/or SIB16. In their lab submission, the Device manufacturer shall identify the option to be used as defined in sections 6.13.5.4.2 and 6.13.5.4.3 concerning the possible use of SIB8 and/or SIB16.

Devices which support Carrier Aggregation shall be tested for performance of the CA combinations according to the latest required versions of the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance and the corresponding Operator Priority List for the set of target operator(s) identified by the manufacturer. No other CA combinations shall be tested unless specifically requested by the target operator(s).

The Device manufacturer shall consult with the operator(s) to which they intend to sell the Device to determine whether the operator has unique requirements.

2.9.2 RF Performance Test Applicability

Test applicability shall be as described in Appendix O of the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance, with these special considerations:

Free-Space testing is optional for notebooks which qualify as “Child” platforms in the PPMD.

Some DUTs include sensors which reduce the transmitter’s RF output power when in close proximity to the user. TRP measurements of any DUT that includes user proximity RF power reduction shall be made when the proximity sensor is not activated (e.g., DUT is operating at full RF output power). The lab shall also measure the DUT’s RF output power when the proximity sensor is activated. This measurement may be made using either conducted or radiated techniques, and the lab shall document the proximity sensor’s RF power reduction in dB.

2.9.2.1 RF Performance Test Applicability – IoT (Internet of Things) Devices

Test applicability for IoT/M2M Devices shall be determined through a combination of the use of Appendices O.5 or O.6 (as applicable) of the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance (Version 3.5.2 or later) and the IoT Device characteristics listed in [Table 2.9-1](#).

TABLE 2.9-1 IoT DEVICE CHARACTERISTICS

	IoT Device Characteristic	Response (Y/N)
1	In its intended application, does the IoT Device transmit more than 100 Kbytes in a transaction?	
2	On average, is the IoT Device expected to send more than 24 transactions per day?	
3	Is the IoT Device and its antenna intended for installation in a fixed orientation relative to the horizon?	

The following requirements apply regardless of the responses in [Table 2.9-1](#) above:

OTA testing shall only be required in the highest-order RAT supported by the Device

OTA testing is required in each supported band within the highest-order RAT supported by the Device

If the Device supports a band in a lower-order RAT that’s not supported in the high-order RAT, the band in the lower-order RAT shall also be tested for OTA performance

If the Device vendor’s response to all of the questions (1) through (3) in [Table 2.9-1](#) above is “N”, then the following test requirements (d) through (g) shall apply:

TRP Testing shall be performed on all supported bands and all channels as required by (a) through (c) above

TIS testing shall be performed only in the mid-channel for each supported band above 1 GHz

TIS testing shall be performed in the low, mid and high channel for each supported band below 1 GHz

Testing shall be performed using an anechoic chamber or a reverberation chamber by an ATL.

- If the Device vendor's response to questions (1) and (2) in [Table 2.9-1](#) is "N", but the response to question (3) is "Y", then in place of TRP and TIS, this type of IoT Device shall be tested for near-horizon radiated performance as described below:
- NHPRP $\pm 30^\circ$ Testing shall be performed on all bands and all channels as required by (a) through (c) above
- NHPIS $\pm 30^\circ$ Testing shall be performed only in the mid channel for each band supported by (a) through (c) above
- NHPRP and NHPIS testing shall be performed in an anechoic chamber by an ATL. If the DUT is physically too large to test in the anechoic chamber, then testing shall be performed in a reverberation chamber, and the reported metrics shall be TRP and TIS.

2.9.3 Applicability of RF Performance Testing to ECOs

RF Performance testing shall be conducted on an ECO if the associated changes impact any of the following areas:

- Hardware design
- Calibration data/procedure
- Maximum output (radiated) power

If the changes do not impact these areas AND conducted RF output power in all supported bands has not changed by more than ± 1 dB, then RF performance testing on the ECO is not necessary. The lab shall then upload a document to the PTCRB certification database, in the Test Results area, providing this justification (see Laboratory Test Report Content section of PPMD).

ECOs for Devices supporting MIMO, which were not required to execute MIMO OTA for the initial certification, are not required to execute the MIMO OTA testing called for in [Section 2.9.4](#) of this document.

2.9.4 Receive Diversity / MIMO

If the Device supports receive diversity, the diversity test conditions shall be in accordance with the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance.

If the Device supports MIMO, the Device shall be tested using the methodology described in the CTIA Certification Test Plan for 2x2 Downlink MIMO and Transmit Diversity Over-the-Air Performance.

Per 3GPP TS 36.306, Category 1 and higher LTE Devices, by definition, are required to support 2 antennas. Any Device unable to support the secondary antenna shall be required to submit a waiver request. If the waiver request is approved, the PTCRB Primary Test Laboratory shall check the LTE Single-Antenna Receiver checkbox in the OTA Performance Test area of the PTCRB certification database and upload the waiver request here. This requirement shall be checked on all Devices regardless of whether they undergo RF Performance testing.

2.9.5 Reduction of Test Case Redundancy

The purpose of this section is to eliminate the need to execute certain specified tests in bands which overlap. The tests covered by this subsection will include a cross-reference to this subsection

2.9.5.1 If the Device supports Band 4 and Band 66, then testing is only required to be completed in Band 66.

2.9.5.2 If the Device supports Band 25 and Band 2, then testing is only required to be completed in Band 25.

2.9.5.3 If the Device supports Band 26 and Band 5, then testing is only required to be completed in Band 26.

2.9.5.4 If the Device supports Band 12 and Band 17, then testing is only required to be completed in Band 12.

2.9.5.5 If the Device supports Band n25 and Band n2, then testing is only required to be completed in Band n25.

2.9.5.6 If the Device supports 5G SA and NSA, each supported SA band is required to be tested. Testing of supported NSA bands shall be executed under "worse case" conditions with maximum conducted power in each supported NR band. NSA testing shall be executed using an LTE anchor agnostic approach.

2.9.6 Audio Testing

If the Device implements audio according to 3GPP Release 4 or later, the audio test cases in 3GPP TS 51.010-2 applicable for Release 4 or later release shall be applied as certification criteria instead of the Audio test cases applicable for Phase 2 and up to R99 terminals.

In addition to the above, terminals which support both GSM and FDD bands shall conduct the AUDIO testing in accordance with the Test Guidelines for test case redundancy as defined in PVG05.

Reference test position according to section 5.3.2 of IEEE 269 – 2002 can be used and shall accordingly be recorded in the test report if used.

The test report shall contain the following information if appropriate and where it is not available from the manufactures PICS statement:

Ear type used for testing

Positioning used in the HATS, as per ITU-T P.64

Nominal volume setting used for receiving related testing

Note: The PTCRB TC database audio test specification 26.132 contains all test cases from all released specification versions.

The test specification is release specific which is different to any other test specifications within PTCRB TC DB. So, tests may differ in their requirements depending on the release version of the test spec. PTCRB TC DB does not take this into account.

Therefore, the manufacturer has to declare against which release the DUT is compliant.

The conclusion is that Devices with an acoustic implementation according to a given release shall be tested against the latest version of the corresponding release of 3GPP TS 26.131 and 3GPP TS 26.132.

2.9.7 Radiated Spurious Emissions

Radiated Spurious Emissions (RSE) testing shall be conducted according to the guidelines established in PVG.04, *"Guideline for Spurious Emission Radiated Testing"*.

Radiated Spurious Emissions testing of a Device supporting multiple RATs shall be tested according to the RAT priority below on a per band basis.

- GSM RSE testing can be exempted if the DUT supports UTRA.
- GSM and UTRA RSE testing can be exempted if the DUT supports E-UTRA.
- GSM and UTRA and LTE RSE testing can be exempted if the DUT supports 5G NR FR1 (SA/NSA) and the DUT's NR FR1 band support includes all supported LTE bands.

If the DUT supports one or more LTE bands that are not supported in NR FR1, LTE RSE testing of the DUT's LTE-specific bands must be executed.

If device supports EN-DC Configurations, device shall be run for each supported NR Band according to latest NAPRD03 test cases database.

To eliminate test redundancy, the RSE tests called for in this section shall be executed according to the rules described in Section 2.9.5 of this document.

IoT Device configurations which support both Category M1 and NB-IoT airlink technologies, may conduct idle-mode RSE testing only in Category M1 mode. Active-mode RSE testing of these Devices shall be executed for both the Category NB1 and Category M1 airlink technologies.

2.9.8 Method for Measuring Power Reduction Due to Proximity Sensor

2.9.8.1 Measuring Power Reduction Due to Proximity Sensor Applicability

The tests described in this section are applicable to all Devices which utilize a proximity sensor for transmit power reduction.

This test shall be performed in all supported bands and in all supported RATs for Low, Mid and High Channels.

Channels used shall be as described in the TRP measurement portion (Section 5) of the CTIA Certification Test Plan for Wireless Device Over-the-Air Performance.

To eliminate test redundancy, the power reduction tests called for in this section shall be executed according to the rules described in Section 2.9.5 of this document.

2.9.8.2 Proximity Sensor PIXIT Declaration

The Device manufacturer shall include a PIXIT declaration describing the Device's maximum power reduction and power tolerance for each supported band in the Low, Mid and High channels.

2.9.8.3 Measuring Power Reduction Due to Proximity Sensor

Measuring Power Reduction due to Proximity Sensor test case is captured in the TC Database.

2.9.8.4 Test Methodology

To perform these tests a System Simulator (SS) and/or spectrum analyzer (or power meter) are required.

1. Ensure that the cable loss of the connection from the DUT to the spectrum analyzer or power meter or SS has been compensated.
2. Measure the maximum average conducted output power by direct connection to the DUT when the proximity is sensor disabled for all supported bands in Low, Mid and High channels.
3. Measure the maximum average conducted output power by direct connection to the DUT when the proximity sensor is manually activated and set to Maximum Power Reduction. This measurement shall be made in all supported bands in Low, Mid and High channels.
4. Steps 2 and 3 shall be repeated for all RATs supported by the DUT.
5. If the DUT does not support a direct connection as required in Steps 1-4 above, power measurement due to activation of a proximity sensor may be accomplished by executing free-space TRP measurements per the most current version of the CTIA Certification Test Plan for Wireless Device Performance, Section 5, as appropriate for the RAT under evaluation. The DUT's TRP shall be measured with the proximity sensor deactivated and with the proximity sensor activated as described above

2.9.8.5 Result Reporting Requirements

The results from measurements made according to Section [2.9.8.3](#) of this document shall be recorded in a table as a separate test report. The test report shall include the following:

- Test equipment configuration and corresponding calibration
- Configuration of the DUT:
- HW
- SW
- IMEI
- SVN
- Manufacturer documentation of declared power reduction

TABLE 2.9-2 POWER REDUCTION DUE TO PROXIMITY SENSOR TEST RESULT

Band	Channel	Maximum Power Reduction (dB) Declared by Manufacturer	Average Conducted Output Power with Sensor Manually Disabled	Average Conducted Output Power with Sensor Manually Set to Maximum Power Reduction	Power Reduction in Measured power reduction (in dB) when the proximity sensor is enabled	Free-space TRP with Sensor Manually Disabled	Free-space TRP with Sensor Manually Set to Maximum Power Reduction
	Low						
	Mid						
	High						

2.10 LTE / LTE Carrier Aggregation (CA) Interoperability Testing

2.10.1 LTE / LTE CA Interoperability Test Plan

The test plans are the CTIA Certification Interoperability Test Plan for LTE Wireless Devices and CTIA Certification Interoperability Test Plan for LTE Carrier Aggregation. The latest version of the test plans can be downloaded from CTIA Certification’s web site at <https://ctiacertification.org/test-plans/>. A listing of labs authorized to conduct the testing can be found on the same web site (under LTE Interoperability and LTE CA Interoperability authorized testing capabilities).

2.10.2 LTE Interoperability Test Applicability

LTE Interoperability testing is an optional PTCRB certification requirement and applies only to LTE Devices. The Device manufacturer shall consult with the operator(s) to which they intend to sell the Device to determine whether this testing is required and, if so, which infrastructure vendors the Device shall be tested against. Should this testing be required, the Device vendor shall check the “LTE Interoperability Testing” checkbox when submitting the PTCRB certification request.

2.10.3 LTE CA Interoperability Test Applicability

LTE CA Interoperability testing is an optional PTCRB certification requirement and applies only to LTE Devices capable of Carrier Aggregation. The Device manufacturer shall consult with the operator(s) to which they intend to sell the Device to determine whether this testing is required and, if so, which infrastructure vendors the Device shall be tested against. Should this testing be required, the Device vendor shall check the “LTE CA Interoperability Testing” checkbox when submitting the PTCRB certification request.

2.11 Test Case Execution Environment

Device certification shall be conducted with all frequency bands enabled according to its capabilities. Devices shall not be reconfigured for any testing purposes.

2.12 UE Capability Audit

For Initial Certifications and Parent Devices, the PTCRB Primary Test Laboratory shall ensure that the contents of the UE capability Information Elements are correctly reported to the network as specified in the Device's relevant PICS/PIXIT statements.

This shall be achieved by successfully running the validated test cases as follows:

- 2.12.1 GERAN only: TS 51.010-1 test case 26.6.11.2
- 2.12.2 GERAN/UTRA Device: TS 34.123-1 test case 8.1.5.7
- 2.12.3 UTRA only Device: TS 34.123-1 test case 8.1.5.7
- 2.12.4 UTRA/E-UTRA Device: TS 34.123-1 test case 8.1.5.7 and TS36.523-1 test case 8.5.4.1
- 2.12.5 GERAN/UTRA/E-UTRA Device: TS 34.123-1 test case 8.1.5.7 and TS36.523-1 test case 8.5.4.1
- 2.12.6 E-UTRA only Device: TS 36.523-1 test case 8.5.4.1
- 2.12.7 5G only device: TS 38.523-1 test case 8.1.5.1.1
- 2.12.8 E-UTRA/5G device: TS 36.523-1 test case 8.5.4.1 and TS 38.523-1 test case 8.2.1.1.1
- 2.12.9 GERAN/UTRA/E-UTRA/5G device: TS 34.123-1 test case 8.1.5.7 and TS 36.523-1 test case 8.5.4.1 and TS 38.523-1 test case 8.2.1.1.1

For any PTCRB Variant / ECO Request, a UE Capability Audit shall be conducted by PTCRB Full Test Laboratory. This audit is required for all Variant / ECO Requests where the GSM, WCDMA or LTE functionality of the Device has been changed or there have been any changes to any feature group functionality. Where MMI only changes have been implemented that have no impact on these areas, the UE Capability Audit will not be required.

These requirements do not apply to Integrated Devices, i.e., Devices embedding a PTCRB-certified module.

2.13 AT-Command Assessment Requirements

2.13.1 AT-Command Applicability

AT-Command assessment is applicable to Devices that support GSMNA AT-Commands. It is limited to all AT-commands supported by the Device and is limited to the PTCRB Bearer Agnostic AT-Command Test Specification.

2.13.2 AT-Command Test Specification

The evaluation of AT-Command is the PTCRB Bearer Agnostic AT-Command Test Specification. The latest specification version can be downloaded from PTCRB Test Case Database.

2.13.3 AT-Command Certification Criteria

All supported AT-commands have to be assessed by the PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory according to the AT-command test specification.

PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory may decide how to perform the test cases and if they wish to use a commercially available test platform.

Test cases are not required to be performed under ISO 17025 accreditation.

Test cases are not required to be validated, but it is recommended.

2.13.4 AT-Command Technical Reference

The following AT-Command specifications shall be used as further references.

3GPP TS 27.005: "3rd Generation Partnership Project; Use of Data Terminal Equipment Data Circuit terminating Equipment(DTE DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

3GPP TS 27.007: "3rd Generation Partnership Project; Technical Specification Group Terminals; AT command set for User Equipment (UE)"

GSMNA AT Commands Specification

2.14 Void

The section for E-UTRA channel bandwidth test cases has been moved to PVG.05.

2.15 TTY Total Character Error Rate Reporting Requirement

This section defines the requirements for reporting TTY Total Character Error Rate (TCER) measurements.

2.15.1 Reporting

TTY TCER measurements results used for conformance testing shall be included in the associated test report. TCER shall be reported to a precision of one-tenth of a percent.

2.15.2 Applicability

Requirement applies to all TCER test cases in the PTCRB Bearer Agnostic TTY Test Specification; specifically test cases 9.3, 9.4, 9.5, 9.6, 9.8, 9.9, and 9.10.

2.16 Connection Efficiency

This section defines the requirements for the applicability of the current version of TS.35 IoT Device Connection Efficiency testing.

2.16.1 Applicability

Testing requirements apply to all Release 8 – 12 IoT Devices.

Devices implementing eUICC shall be exempt until eUICCs are incorporated into TS.34 and TS.35.

Test requirement is based on Test Applicability and Classification from GSMA TS.35 Annex C.

Device shall test to the highest RAT (E-UTRA or GERAN) supported by the test case which is also supported by the Device.

2.17 Supplementary Services and NITZ

This section identifies the requirements for Devices supporting Supplementary Services or NITZ. This applies to the test cases of 3GPP TS 34.123-1, section 15, and 3GPP TS 51.010, section 31, which may be considered redundant. See PVG.05 – Guideline for Test Case Redundancy for Dual Mode (GERAN / UTRA-FDD) Terminals.

2.17.1 New Testing

Any new Device testing or required retesting shall be done utilizing the validated test cases of 3GPP TS 34.123-1.

2.17.2 Previously Certified Devices

Devices previously certified with the test cases of 3GPP TS 51.010 will not be required to retest with the test cases of 3GPP TS 34.123-1 unless the ECO changes have warranted retesting of the functionality. In this case, the 3GPP TS 34.123-1 version of the test case shall be utilized.

2.18 Embedded Secure Element (eSE)

This section identifies the requirements for Devices supporting eSE. This refers to the requirements of GSMA's NFC Test Book.

2.18.1 Applicability

This requirement applies to any new Device or Devices being recertified due to changes to the eSE capability. Previously certified Devices will not be required to retest with the test cases of NFC Test Book unless the ECO changes have warranted retesting of the eSE functionality.

2.18.2 All other NFC Test Book Testing

This testing may only be conducted by a PTCRB Full Test Laboratory technology qualified for eSE. The PTCRB Primary Test Laboratory will upload the eSE report to the PTCRB certification database. The PTCRB Full Test Laboratory may use test results acquired from a PTCRB Associate Test Laboratory technology qualified for eSE, of which they sponsor.

2.19 Void

The section for extreme test conditions has been moved to PVG.05.

2.20 Execution of Test Cases for E-UTRA Carrier Aggregation (CA)

2.20.1 Band 66 and Carrier Aggregation (CA)

For a Device supporting Band 66 and CA, the following LTE CA intra-band component carrier combinations shall be tested:

- CA_66A-66A
- CA_66B
- CA_66C

2.21 IoT Cybersecurity Assessment Requirements

2.21.1 IoT Cybersecurity Certification Test Plan

The test plan is the CTIA Cybersecurity Certification Test Plan for IoT Devices. The latest version of this test plan can be downloaded from <https://ctiacertification.org/test-plans/>. A list of labs authorized to conduct this testing can be found on the same website (under cybersecurity authorized testing capability).

2.21.2 IoT Cybersecurity Test Applicability

IoT Cybersecurity testing is an optional PTCRB certification requirement and applies only to IoT Devices. The Device manufacturer shall consult with the operator(s) to which they intend to sell the Device to determine whether this testing is required. Should this testing be required, the Device vendor shall check the “IoT Cybersecurity” checkbox when submitting the PTCRB certification request.

2.22 Void

The section for multi-band relaxation (MBR) declaration/execution requirements has been moved to PVG.05.

2.23 Alternative NB-IoT Guard Band Test Channels

2.23.1 Guard Band Test Channel Selection in Bands 12, 13, and 71

This section defines alternative “Low” and “High” test channels that shall be utilized by the PTCRB Laboratory responsible for certification testing of NB-IoT UEs operating in the guard band for Bands 12, 13 and 71. The alternative test channels below shall only be utilized if the NB-IoT DUT vendor has permanently disabled the 3GPP-specified “Low” and “High” guard band test channels in these bands to comply with regulatory out-of-band emissions (OOBE) requirements as described in NAPRD.03, Section 2.23.2.

TABLE 2.23-1 ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 12

Test Frequency ID	LTE Cell Bandwidth [MHz]	N _{UL}	M _{UL}	Frequency of Uplink [MHz]	N _{DL}	M _{DL}	Frequency of Downlink [MHz]
Low Range	Any	23012	0	699.2000	5012	1	729.2075
High Range	Any	23178	0	715.8000	5178	-2	745.7925

TABLE 2.23-2 ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 13

Test Frequency ID	LTE Cell Bandwidth [MHz]	N _{UL}	M _{UL}	Frequency of Uplink [MHz]	N _{DL}	M _{DL}	Frequency of Downlink [MHz]
Low Range	Any	23182	3	777.2150	5182	1	746.2075
High Range	Any	23278	-3	786.7850	5278	-2	755.7925

TABLE 2.23-3 ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 71

Test Frequency ID	LTE Cell Bandwidth [MHz]	N _{UL}	M _{UL}	Frequency of Uplink [MHz]	N _{DL}	M _{DL}	Frequency of Downlink [MHz]
Low Range	Any	133124	0	663.2000	68588	1	617.2075
High Range	Any	133470	0	697.8000	68934	-2	651.7925

2.23.2 Applicability of Alternative NB-IoT Guard Band Test Channels

The PTCRB Primary Laboratory shall be responsible for determining whether the DUT has permanently disabled the NB-IoT guard band channels in Bands 12, 13 and 71 specified for conformance testing by the applicable portions of 3GPP TS 36.508, Clause 8.1.3.1. If these NB-IoT guard band channels are not permanently disabled, conformance testing of the DUT shall be executed using the test channels described in 36.508 and NAPRD.03 Section 2.23.1 does not apply.

If the DUT has permanently disabled the NB-IoT guard band test channels specified by 3GPP TS 36.508, Clause 8.1.3.1, testing shall be executed using the alternative test channels described in NAPRD.03, Section 2.23.1, Table 2.23-1 through Table 2.23-3 as applicable.

The PTCRB Primary Test Laboratory shall be responsible for ensuring that all testing executed against NB-IoT DUTs operating in the guard band of Band 12, 13 and 71, including tests performed by other labs, have been executed using the same lower and upper guard band test channels in each band.

2.24 Network Independent UICC Test Cases

This section identifies the applicability of Network Independent (NI) UICC test cases for Devices supporting LTE-M or NB-IoT.

2.24.1 Applicability if LTE-M or NB-IoT

If at least one LTE-M or NB-IoT frequency band is supported, Network Independent (NI) UICC test cases of RFT029, 058 and 085 are applicable as per PICS.

Section 3 Application Enablers Evaluation, General Information

This section defines the requirements for the certification of the Application Enablers that are implemented in the Device and are required for PTCRB certification.

3.1 Application Enabler (AE) Test Applicability

3.1.1 AE Testing Required

All Devices supporting application enablers that are applicable for PTCRB certification. Specific details on individual application enabler certification requirements are given in the following sections.

3.1.2 AE Testing Not Required

- Devices that do not support application enablers
- PCMCIA cards
- Variants, re-branded Devices having no altered AE implementation from their Parent Device

3.1.3 AE Test Specification

This section lists test specifications applicable to application enablers required for PTCRB certification. The latest approved version of the listed test specification shall be used. If the SDO or standardization forum who has the ownership of the test specification has approved any change requests which are yet to be incorporated into the test specification, then these change requests should be used for validations and referenced in the validation report.

3.1.4 ECOs

AE testing shall be conducted on an ECO if the associated changes impact any of the following areas:

- AE protocol implementation
- Underlying protocols

If the changes do not impact these areas, then AE testing for an ECO is not necessary and the PTCRB Primary Test Laboratory shall provide a declaration to the PTCRB certification database stating that testing was not required.

3.1.5 Application Enabler Certification Criteria

Devices supporting application enablers required for PTCRB certification shall fulfill all applicable application enabler conformance criteria.

The Certification Criteria for application enabler can include both Conformance and Interoperability tests.

Conformance testing shall be performed in a PTCRB Full Test Laboratory, which is approved for the application enabler being tested.

Interoperability test results shall be provided by the manufacturer and testing does not have to be performed by a PTCRB Full Test Laboratory. Interoperability testing can be proved through Field Trials, bi-lateral testing and/or multi-lateral events (e.g., Test Fests hosted by OMA). The conditions for the I-lateral testing and/or multi-lateral event results to be accepted for PTCRB certification are:

- The manufacturer shall submit a declaration stating that the changes (if any) introduced in the implementation tested in the test event, the results of which are being presented for certification, have not changed the behavior of the functionality tested. These results will be accepted to apply for certification if they comply to the Certification Criteria
- All test results shall be submitted to the PTCRB Primary Test Laboratory for inclusion in the test report, to obtain the certification
- The test configuration shall be described and made available in the Certification Declaration
- Manufacturers are responsible for making all the necessary arrangements to be able to disclose results of I-lateral and/or multi-lateral testing for Certification purposes
- Where test Certification Criteria includes client-to-client testing, manufacturers are also responsible for seeking the appropriate Device to test against, contacting other Device manufacturers on a "reasonable effort" basis

As a general recommendation, in 'client-t- client' testing, the DUT should run the applicable tests against already certified Devices if available.

If the application enabler implementation has already obtained GCF or PTCRB certification, the manufacturer may choose to re-use the test results under the following conditions:

- The manufacturer can guarantee that no changes in the protocol stack of the enabler for which certification is sought, and in the applicable underlying application protocol stacks like WAP, HTTP, SIP, RTP, RTCP etc., that could affect the AE functionality have been introduced from the AE client version that obtained certification.
- The manufacturer can guarantee that no changes in the overall AE behavior have been introduced from the version that obtained certification, and no features not included in the original version that obtained certification are added to the AE client that is seeking certification.

The manufacturer shall provide all the test results from the testing that was conducted for original certification and any further latest test results, as appropriate.

3.1.6 AE Technical Requirements

This section gives details of the application enabler core specifications relevant for PTCRB certification. For validation' the latest approved version, if available, of all the listed specifications should be used. If the SDO or standardization forum that has ownership of the specification has approved any change requests of the content of the specification, which are yet to be incorporated into the document, then these change requests should be used for validations and referenced in the validation report.

3.1.7 AE Options Table/ICS/Test Case Mapping Document

The Options table, ICS or Test Case Mapping Table, as appropriate, shall be filled out by the manufacturer to indicate the features implemented in the client. This shall be submitted by the manufacturer to the PTCRB certification database as part of the certification submission.

If the Options table, ICS or Test Case Mapping table is contained in external specifications a reference to the document should be added to this section.

All mandatory features, of the implemented enablers for which certification is sought, as specified in the applicable SDO enabler release specifications shall be implemented in the Device.

3.1.8 AE Interoperability Test Results

This section details how to present IOP test results and information on tested configurations.

3.2 Specific Application Enabler Test Requirements

3.2.1 Void

3.2.2 Deleted

3.2.3 Deleted

3.2.4 Deleted

3.2.5 Deleted

3.2.6 Device Management

3.2.6.1 Device Management Applicability

Device Management testing is applicable to all Devices that support OMA Device Management version 1.2

3.2.6.2 Device Management Test Specification

The evaluation of Device Management is the OMA ETS-DM. This test specification can be downloaded from OMA's web site:

<http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/dm-v1-2>

3.2.6.3 Device Management Certification Criteria

The Device Management test cases are captured in the PTCRB TC Database.

3.2.6.4 Device Management Technical Requirements

The following OMA Device Management Core specifications shall be used as the basis for all validations.

DM 1.2: <http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/dm-v1-2>

3.2.7 Secure User Plane Location (SUPL)

3.2.7.1 Secure User Plane Location (SUPL) Applicability

SUPL testing is applicable to Devices that support OMA SUPL version 1.0 or 2.0.

3.2.7.2 SUPL Test Specification

The evaluation of SUPL is the OMA ETS-SUPL. This test specification can be downloaded from OMA's web site at <http://openmobilealliance.org/>.

3.2.7.3 SUPL Certification Criteria

The SUPL Conformance test cases are captured in the PTCRB TC Database.

3.2.7.4 SUPL Technical Requirements

The following OMA SUPL Core specifications shall be used as the basis for all validations.

SUPL_1.0: <http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/secure-user-plane-location-v1-0>

SUPL 2.0: <http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/secure-user-plane-location-v2-0-2>

3.2.8 Deleted

3.2.9 FUMO

3.2.9.1 FUMO Applicability

FUMO testing is applicable to all Devices that support OMA FUMO version 1.0.

3.2.9.2 FUMO Test Specification

The test plan for the evaluation of FUMO is OMA ETS FUMO V1.0. This test specification can be downloaded from OMA's web site at <http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/fumo-v1-0>

3.2.9.3 FUMO Certification Criteria

The FUMO test cases are captured in the PTCRB TC Database.

3.2.9.4 FUMO Technical Requirements

The following OMA FUMO Core specifications shall be used as the basis for all validations.

FUMO 1.0: <http://technical.openmobilealliance.org/Technical/technical-information/release-program/current-releases/fumo-v1-0>

3.2.9.5 FUMO Interoperability Test Results

The Client-to-Server test cases from NAPRD03 shall be executed at least once against any OMA-DM server supporting FUMO (S1...S3).

Client-to-Server Interoperability Test Cases

The following abbreviations are used to identify the Test Verdict:

Ex = Test Case executed, no fault or problem with the DUT was encountered.

n/a = Test is not applicable since the FUMO Option is not supported by the device

nS = No server supporting this test is commercially available

Manufacturers shall submit the test results and details of tested configurations for the Interoperability Test cases (as specified in the PTCRB TC Database) using the following formats:

TABLE 3.2-1 CLIENT-TO-SERVER INTEROPERABILITY TEST RESULTS TABLE

OMA FUMO ETS Reference		Test Count			Comments
No.	Description	S1	S2	S3	
1	Interoperability test case 1				
2	Interoperability test case 2				
3	Interoperability test case 3				

TABLE 3.2-2 CONFIGURATION USED FOR CLIENT-TO-SERVER INTEROPERABILITY TESTING

Servers tested against (S)			
S1	OMA-DM/ FUMO Server		
	Manufacturer	SW Version	Enabler Release
S2	OMA-DM/ FUMO Server		
	Manufacturer	SW Version	Enabler Release
S3	OMA-DM/ FUMO Server		
	Manufacturer	SW Version	Enabler Release

Appendix A Change History

Date	Version	Description
1997 - 2019	1.0 – 5.42	
April 2020	6.0	Document restructured
April 2020	6.0.1	No change is made to the NAPRD03 document. This version is released to be consistent with the latest PTCRB Test Case Database changes.
June 2020	6.1	Numerous updates and deletions, the most important include the following: a) The addition of reference identifiers in square brackets. b) The addition of references to PVG PRDs in Section 2.3.21 c) Moved Section 2.9.8.2 (Test Case Redundancy) to 2.9.5 under the same name to improve the order of sections within the document and updated it to include overlapping NR FR1 bands, d) As a result of (d) above, 2.9.8.3 through 2.9.8.6 moved up by one forth-level digit and any references to test redundancy point to 2.9.5. e) Updated the RSE airlink priority order in Section 2.9.7 to include NR FR1 at the top of the airlink selection list per PVG20089054. f) Added FR2 Multiband Relaxation to new section 2.22 per PVG20089055_R1.
October 2020	6.2	a) Updated the copyright text b) Section 2.8: Added supporting operators to Table 2.8-3, 2.8-4.1, 2.8-4.2 c) Section 2.22.2: Added MB relaxation requirement framework
October 2020	6.2.1	No change is made to the NAPRD03 document. This version is released to be consistent with the latest PTCRB Test Case Database changes.
January 2021	6.3	a) Added 3GPP TS 31.121 and 31.124 references to clauses 2.3.2 and 2.3.4 as [24] and [25] as well as [35] and [36], respectively b) Updated clause 2.7.6 to include Category S, eliminate “N All” changing it to “N” and eliminating “N Next” c) Added SA/NSA to 2.9.7; Added “ <i>EN Single prio</i> ” and “ <i>NR Single prio</i> ” to Clause 2.7.10 d) Added “ <i>Table 2.7.10-1 “EN and NR Single Prio Band Hierarchy”</i> ” to Clause 2.7.10 e) Added Section 2.23
March 2021	6.4	a) Updated the PTCRB band information in Section 2.8 b) Added clarification in Section 2.23.1
June, 2021	6.5	a) Removed UTRA Band IV from PTCRB Certification b) Replaced UICC based NFC services references with Embedded Secure Element (eSE) in Section 2.3.6 and 2.18 c) Removed MMS requirements in Section 3.2.1 d) Included E-UTRA extreme testing in Section 2.19

Date	Version	Description
September, 2021	6.6	<ul style="list-style-type: none"> a) Added n12, n14, n26, and n29 to FR1 SA FDD bands in Table 2.8 4.1 b) Updated Section 2.9.7, Radiated Spurious Emissions, with exemptions c) Updated Section 2.9, RF Performance Evaluation, section introduction text d) Updated Section 2.18.2 regarding UICC based NFC tests e) Moved extreme test conditions, multi-band relaxation (MBR) declaration/execution requirements, and E-UTRA channel bandwidth test cases to PVG.05