Permanent Reference Document NAPRD03

Version Specific Technical Overview of PTCRB Certification Program

Version 6.12

April 2023

PTCRB Certification Program

1400 16th Street, NW

Suite 600

Washington, DC 20036

programs@ctiacertification.org

1.202.785.0081

www.ptcrb.com

Table of Contents

List of Figures

No table of figures entries found.

List of Tables

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 GERAN/UTRA/E-UTRA/NR wireless devices.

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 Test Specifications

2.3.1 GERAN:

[1] 3GPP TS 51.010 (formerly GSM 11.10)

[2] 3GPP TS 51.010-4 (Deleted)

2.3.2 UTRA:

[3] 3GPP TS 34.121

[4] 3GPP TS 34.123

[5] 3GPP TS 31.121 (USIM) (Deleted)

[6] 3GPP TS 31.124 (USAT)

[7] 3GPPTS 26.132 (Audio) (Deleted)

[8] 3GPP TS 34.108 (Deleted)

[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 (Deleted)

[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 (Deleted)

[34] 3GPP TS 38.533

[35] 3GPP TS 31.121 (USIM)

[36] 3GPP TS 31.124 (USAT)

2.3.5 Data Throughput:

[50] 3GPP TR 37.901

2.3.6 Near Field Communication (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 (Deleted)

[81] 3GPP TS 37.571

Positioning Exceptions tables moved to PVG.05

Note 1: Void.

Note 2: Void.

2.3.8 Cybersecurity Evaluation:

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

2.3.9 Device RF Performance Evaluation:

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

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

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*, Current Version.

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

2.3.11 MMS (Multimedia Messaging Service) (Deleted)

2.3.12 OMA SUPL (Secure User Plane Location) 1.0, 2.0

[121] OMA-ETS-SUPL-V1_0

[122] OMA-ETS-SUPL-V2_0

2.3.13 IP Multimedia Subsystem (IMS)

[130] 3GPP TS 34.229

2.3.14 OMA DM 1.2 (Deleted)

2.3.15 TTY:

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

[151] *GERAN TTY Test Specification,* Rev. 4.31 (Deleted)

[152] *TTY UTRA Test Specification,* Rev. 2.0 (Deleted)

Note 3: Void

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* Current Version

2.3.17 AT-Commands (Deleted)

2.3.18 OMA FUMO 1.0 (Deleted)

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 Frequency Bands and Frequency Band Combinations for E-UTRA and 5G*"

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

[213] PVG.13: *"Confidence Test Case List for Modules Using Certified Chipsets or End Products Using Certified Chipsets"*

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 device 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 E-UTRA Carrier Aggregation, NR Dual-Connectivity, NR Carrier Aggregation, 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 2.7.2-1 PTCRB TC DATABASE *PARAMETER FIELD* NAMING RULES

Technology	Test Case Parameter: Example Allowed Values	Comment
NR Bands	n2 n260	Numeric values for the bands shall be used with a leading lower-case “n” prior to the band number and without any leading zeros.
	n25-n66	Numeric values for the Inter-Band between two NR Bands and applicable for Inter-Band test case.
	DC_14A_n2 DC_2A_n260A	Numeric values for the bands with at least one E-UTRA bands and one NR FR1 or FR2 bands as EN-DC configurations.
CA Bands	CA_2A-17A CA_n66A-n71A	Numeric values for the bands with at least two component carrier in E-UTRA bands or NR bands as Carrier Aggregation configurations.
4Rx Bands	n7_RX4	Numeric values for the bands shall be used with an ending “_RX4” after to the band number and without any leading zeros.

Technology	Test Case Parameter: Example Allowed Values	Comment
E-UTRA bands	FDD4 TDD41	Numeric values for the bands shall be used without any leading zeros.
	FDD4M	Numeric values for the bands shall be used with an ending capital-case "M" after to the band number and without any leading zeros, which applicable to the Cat-M test case.
UTRA bands	FDDII	Roman numerals shall be used to differentiate between UTRA & E-UTRA.
GERAN bands	1900	The GERAN bands with no qualification before or after the actual band definition.
General	Band Independent	The test case can be performed with any frequency band within a radio technology, supported by the terminal.
	Bearer agnostic	The test case can be performed with any RAT supported by the terminal
	BI-M	The Cat-M test case can be performed with any frequency band within a Cat-M radio technology, supported by the terminal.
	Network Independent	The test case can be performed on test platforms that do not require any network access capability.
	EN-BI	The test case can be performed with priority EN-DC configuration defined in Table 2.7.10-1, supported by the terminal.
	NR-BI	The test case can be performed with priority NR band defined in Table 2.7.10-1, supported by the terminal.

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 2.7.6-1 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 the device to pass this 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 2.7.6.1-1 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 device 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 device 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 2.7.6.2-1 *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 device 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 device 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 device 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 a TCH/S device and a DATA-only device, but the test can be performed for a TCH/S device only.
Test case result:
A Category "B" test case shall be passed for the device 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 2.7.6.3-1 *CATEGORY "D" DEFINITION*

Definition of this category:
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. 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.
This category is used for:
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.
Example:
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.
Test case result:
A Category "D" test case is not executed.

2.7.6.4 Category "E"

TABLE 2.7.6.4-1 *CATEGORY "E" DEFINITION*

Definition of this category:
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 devices 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 device failure, the comment shall include what type of error was indicated by the test equipment. Where a Category "E" test case has failed on a previous certification of the device or is leveraging results from a related device (i.e., Parent, Module), if changes have been made to the device which may alter the result of the test case, the test shall be re-run for the subsequent certifications. Where a Category "E" test case has failed due to a fault of the test implementation on a previous certification of the device or is leveraging results from a related device (i.e., Parent, Module), if changes have been made to the test implementation, the test shall be re-run for the subsequent certifications. Interoperability tests may be executed by the manufacturer as defined in Section 3.2 of this document.
This category is used for:
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".
Example:
Tests that have been validated but have not been moved to Category "A" such as new 5G test cases or features not supported by all operators such as MTSI Voice via 5GS or EN-DC including FR2.
Test case result:
A Category "E" test case shall be executed. However, a Pass result is not required for the device to obtain PTCRB certification. See the guidelines of PVG.12 for the process on how to deal with test case failures during certification.

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 2.7.6.5-1 *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 2.7.6.6-1 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 2.7.6.7-1 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 NAPRD03 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 RAT 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 device.

2.7.9.3 Network Independent

A test case which is validated without the use of a RAT 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 RAT 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 executed in a single PTCRB Band with no specified band prioritization.

"FR Single" indicates that the applicable NR test case (e.g., protocol testing) shall be executed in a single PTCRB NR FR1 Band and a single NR FR2 Band with no specified band prioritization.

"NR Single prio" indicates that the applicable test case shall be executed in a single PTCRB NR Band with a band execution priority order to be followed as specified in Table.2.7.10-1 below

TABLE 2.7.10-1 SINGLE PRIO BAND HIERARCHY

Bearers to be Tested	Parameter Value	Priority Bands to be tested
NR Single prio	EN-BI	**Priority 1:** DC_5A_n66A **Priority 2:** DC_66A_n78A **Priority 3:** DC_12A_n66A **Priority 4:** Any EN-DC configuration supported by the Device for which validated EN-BI tests are available
NR Single prio	NR-BI	**Priority 1:** NR n66 **Priority 2:** NR n71 **Priority 3:** NR n2

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

"All" indicates that the device shall be tested in all PTCRB Bands relevant to the RAT under test. Section 2.8 of this document identifies all PTCRB Bands by RAT. 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 test execution in these bands shall follow PTCRB rules. Inter-RAT test cases shall be executed in all frequency band combinations supported by the device.

"I-RAT Single" – indicates an Inter-RAT test case that shall be executed 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 executed in PTCRB Bands.

Blank – indicates that the test does not require a bearer

"RAT All" indicates that the applicable test case shall be executed once in each supported RAT but only in PTCRB Bands within each supported RAT.

"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 GERAN, or where a mixture of test capabilities for UTRA and GERAN 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 of the GERAN PTCRB Bands supported by the device.

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.

GCF Certification test results for GCF Bands (i.e., bands not listed in the latest PVG.11), will be recognized as a substitute for PTCRB test results in the GCF bands, provided the GCF RTO (Recognised Test Organisation) executing the tests is, at a minimum, an active Observing member of the PVG (i.e., a lab with regulatory duties within a specific country or PTCRB device Manufacturer).

The applicability of leveraged test results from the GCF certification test scope shall be confirmed by the PTCRB Primary Test Laboratory responsible for the Initial PTCRB certification of the device.

Otherwise, any GCF Band test cases assessed as potentially failing to meet PTCRB requirements shall be performed in a PTCRB Full Test Laboratory or PTCRB Associate Test Laboratory as delegated by the PTCRB Primary Test Laboratory. Spot-checking of leveraged test results may be allowed at the discretion of the PTCRB Primary Laboratory. The PTCRB Primary Test Laboratory shall be responsible for uploading the GCF Certification test results to the PTCRB certification database along with their own test results.

Note: An active Observing PVG member will be listed in the appropriate section of PVG.02 Annex 2 and will attend at least one PVG meeting and one PTCRB Plenary meeting per year.

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

2.8 PTCRB Bands

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

TABLE 2.8-1 PTCRB BANDS BY RAT, FREQUENCY RANGE AND BAND

GERAN	UTRA	E-UTRA	NR FR1	NR FR2[1]
850 MHz	Band II	FDD Band 2	FDD Band n2	n257
1900 MHz	Band V	FDD Band 4	FDD Band n5	n258
		FDD Band 5	FDD Band n7	n260
		FDD Band 7	FDD Band n12	n261
		FDD Band 12	FDD Band n14	
		FDD Band 13	FDD Band n25	
		FDD Band 14	FDD Band n26	
		FDD Band 25	FDD Band n29[2]	
		FDD Band 26	FDD Band n30	
		FDD Band 29[3]	TDD Band n38	
		FDD Band 30	TDD Band n41	
		TDD Band 41	TDD Band n48	
		TDD Band 42	FDD Band n66	
		TDD Band 43	FDD Band n70	
		TDD Band 48	FDD Band n71	
		FDD Band 66	TDD Band n77	
		FDD Band 71	TDD Band n78	
		FDD Band 85		

[1] The NR FR2 bands list in this column have been included to provide FR2 conformance test coverage and shall be considered EN-DC configurations including FR2 with LTE anchor-agnostic approach.

[2] NR FR1 FDD Band 29 supports SDL-only, and as such is only supported during NR NSA EN-DC operation.

[3] E-UTRA FDD Band 29 supports SDL-only, and as such is only supported during E-UTRA CA operation.

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.

TABLE 2.8-2 PTCRB BAND N77 SUB-BAND NAMING CONVENTION (INFORMATIVE)

Band n77 Sub-band Frequency Range	Proposed PTCRB n77 Sub-band Name	3GPP Specification Reference Per Band n77 Sub-band
3700-3980 MHz	Band n77R1	3GPP TS 38.101-1, Release 16, Table 5.2-1, Note 12 3GPP TS 38.306, Release 16, Clause 4.2.7.11, *extendedBand-n77-r16*
3450-3550 MHz	Band n77R2	3GPP TS 38.101-1, Release 16, Table 5.2-1, Note 12 3GPP TS 38.306, Release 16, Clause 4.2.7.11, *extendedBand-n77-r16*
3450-3650 MHz	Band n77R3	3GPP TS 38.101-1, Release 17, Table 5.2-1, Note 12 3GPP TS 38.306, Release 17, Clause 4.2.7.11, *extendedBand-n77-2-r17*
3650-3980 MHz	Band n77R4	3GPP TS 38.101-1, Release 17, Table 5.2-1, Note 12 3GPP TS 38.306, Release 17, Clause 4.2.7.11, *extendedBand-n77-2-r17*

2.9 RF Performance Evaluation

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.) OTA device assessment shall be based on the requirements described in sub-clause 2.9.1 through 2.9.5 below.

2.9.1 OTA Performance Test Requirements

The test plan to be utilized for the evaluation of OTA Performance for GERAN, UTRA, E-UTRA and NR FR1/FR2 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 *CTIA Certification Test Plan for Wireless Device Over-the-Air Performance* 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 RATs and bands listed in Table 2.9.1-1 shall be tested for OTA performance as part of PTCRB certification:

TABLE 2.9.1-1 OTA PERFORMANCE TESTING REQUIREMENTS BY RAT AND BAND

GERAN	UTRA	E-UTRA	NR FR1	NR FR2
850	Band II	Band 2	TBD	TBD
1900	Band V	Band 4		
		Band 5		
		Band 7		
		Band 12		
		Band 13		
		Band 14		
		Band 25		
		Band 26		
		Band 30		
		Band 41		
		Band 48		
		Band 66		
		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 (e.g., CWG Test Plan) subject to the RF Performance Test Applicability defined in Section 2.9.2 of this document.

Until an M2M OTA methodology is codified and made mandatory for ATLs, 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 GNSS OTA performance 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 device's target operator(s) for operator requirements concerning 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 all relevant CA combinations according to the latest version 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 OTA Performance Test Applicability

OTA test applicability shall be determined as described in 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 devices include sensors which reduce the transmitter's RF output power when in close proximity to the user. TRP measurements of any device that includes user proximity RF power reduction shall be made when the proximity sensor is not activated (e.g., device is operating at full RF output power).

  If the device includes a proximity sensor, the OTA Test lab shall also measure the device'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.

OTA Performance Test Applicability – IoT (Internet of Things) devices, OTA 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 4.0 or later) and the IoT device characteristics listed in Table 2.9.2-1.

TABLE 2.9.2-1 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 2.9.2-1 above:

- OTA testing shall only be required in the highest-order RAT supported by the IoT device
- OTA testing is required in each supported band within the highest-order RAT supported by the IoT device
- If the IoT 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 IoT device vendor's response to all of the questions (1) through (3) in Table 2.9.2-1 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 Table 2.9.1-1 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 2.9.2-1 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 ±30° Testing shall be performed on all bands and all channels as required by Table 2.9.2-1 above
    - NHPIS ±30° Testing shall be performed only in the mid channel for each band supported by Table 2.9.2-1 above
    - NHPRP and NHPIS testing shall be performed by an ATL in an anechoic chamber. If the IoT device 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 OTA Performance Testing to ECOs

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

- Hardware design changes applicable to any of the RATs listed in Table 2.9.1-1 as well as GNSS
- Calibration data/procedure applicable to any of the RATs listed in Table 2.9.1-1 as well as GNSS
- 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 OTA 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 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 OTA Performance testing.

2.9.5 Reduction of Test Case Redundancy

The purpose of this section is to eliminate the need to execute certain specified OTA performance, as well as GNSS conformance/performance tests per CTIA OTA Document 01.51 in bands which overlap. The tests covered by this subsection will include a cross-reference to this subsection.

The overlapping band rules specified in sub-clause 2.9.5.1 through 2.9.5.6 below apply to all band-specific OTA performance tests, band-specific GNSS conformance and performance tests, as well as NAPRD03 Section 2.9.7 RSE conformance tests across all RATs and operating bands listed in Table 2.9.1-1.

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

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

2.9.5.3 If the Device supports both 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 or Band 85, then testing is only required to be completed in Band 12.

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

2.9.5.6 If the Device supports both Band n26 and Band n5, then testing is only required to be completed in Band n26.

2.9.5.7 If the Device supports NR 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 section 7 of 3GPP TS 26.132 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.

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 TS 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.

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

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

If the device supports EN-DC Configurations, the 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 Sections 2.9.5 and 2.9.6 of this document.

IoT device configurations which support both Category M1 and NB-IoT RAT 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 RAT.

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 Section 01.50 of the *CTIA Certification Test Plan for Wireless Device Over-the-Air Performance* [101] (V 4.0 or higher).

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 and 2.9.6 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 device 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 device 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 device 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 device.
5. If the device 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* [101], Section 5, as appropriate for the RAT under evaluation. The device'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 2.9.8.4 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 device
- Hardware
- Software
- IMEI
- SVN
- Manufacturer documentation of declared power reduction

TABLE 2.9.8.5-1 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 E-UTRA / E-UTRA Carrier Aggregation (CA) Interoperability Testing (Deleted)

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 (Deleted)

2.12.2 GERAN/UTRA device: 3GPP TS 34.123-1 test case 8.1.5.7

2.12.3 UTRA only device: 3GPP TS 34.123-1 test case 8.1.5.7

2.12.4 UTRA/E-UTRA device: 3GPP TS 34.123-1 test case 8.1.5.7 and 3GPP TS 36.523-1 test case 8.5.4.1

2.12.5 GERAN/UTRA/E-UTRA device: 3GPP TS 34.123-1 test case 8.1.5.7 and 3GPP TS 36.523-1 test case 8.5.4.1

2.12.6 E-UTRA only device: 3GPP TS 36.523-1 test case 8.5.4.1

2.12.7 NR only device: 3GPP TS 38.523-1 test case 8.1.5.1.1

2.12.8 E-UTRA/NR device: 3GPP TS 36.523-1 test case 8.5.4.1 and 3GPP TS 38.523-1 test case 8.2.1.1.1

2.12.9 GERAN/UTRA/E-UTRA/NR 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

2.12.10 Device with GEA1 disabled: 3GPP TS 51.010-1 test case 44.2.5.2.5

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 GERAN, UTRA or E-UTRA functionality of the device has been changed or any changes have been made 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 with the exception of Integrated Devices embedding a PTCRB-certified module disabling VoLTE features, in which case a PTCRB Authorized Test Laboratory shall perform a UE Capability Audit per NAPRD03 Section 2.12.6 through 2.16.8.

2.13 AT-Command Assessment Requirements (Deleted)

2.14 Execution of E-UTRA Channel Bandwidth Test Cases (Deleted)

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 [150]; 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 GSMA TS.35 IoT Device Connection Efficiency testing.

2.16.1 Applicability

Testing requirements apply to all IoT devices supporting 3GPP Release 8 – 12 IoT Devices.

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

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

IoT Devices shall execute Connection Efficiency tests using the highest RAT supported by both the test case and 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.

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 being recertified due to eSE capability changes. Previously certified devices are not required to retest with test cases from the NFC Test Book unless the ECO changes have warranted retesting of the device's eSE functionality.

2.18.2 All other NFC Test Book Testing

This testing must be executed by a PTCRB Full Test Laboratory technology qualified for eSE. The PTCRB Primary Test Laboratory will upload the device's 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 Extreme Test Conditions (Deleted)

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

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

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 Multi-Band Relaxation (MBR) Declaration/Execution Requirements (Deleted)

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 (Informative)

2.23.1 Guard Band Test Channel Selection in Bands 12, 13, 71 and 85:

This section provides[4] “Low” and “High” NB-IoT test channels that shall be utilized by the PTCRB Laboratory responsible for certification testing of NB-IoT devices operating in the guard band for Bands 12, 13 71 and 85.

TABLE 2.23.1-1 ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 12 WITH NS_04 SIGNALING:

Test Frequency ID	E-UTRA Cell Bandwidth [MHz]	NUL	MUL	Frequency of Uplink [MHz]	NDL	MDL	Frequency of Downlink [MHz]
Low Range	Any	23011	0	699.1000	5011	1	729.1075
High Range	Any	23178	0	715.8000	5178	-2	745.7925
The test channels above are applicable to either 3.75 kHz or 15 kHz UL sub-carrier spacing							

[4] 3GPP TS 36.508, V17.0.0. (2021-09), Clause 8.1.3.1

TABLE 2.23.1-2 ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 13 WITH NS_04 SIGNALING:

Test Frequency ID	E-UTRA Cell Bandwidth [MHz]	NUL	MUL	Frequency of Uplink [MHz]	NDL	MDL	Frequency of Downlink [MHz]
Low Range	Any	23181	3	777.1150	5181	1	746.1075
High Range	Any	23278	-3	786.7850	5278	-2	755.7925
The test channels above are applicable to either 3.75 kHz or 15 kHz UL sub-carrier spacing							

TABLE 2.23.1-3, ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 71 WITH NS_04 SIGNALING:

Test Frequency ID	E-UTRA Cell Bandwidth [MHz]	NUL	MUL	Frequency of Uplink [MHz]	NDL	MDL	Frequency of Downlink [MHz]
Low Range	Any	133124	3	663.2150	68588	1	617.2075
High Range	Any	133470	-3	697.7850	68934	-2	651.7925
The test channels above are applicable to either 3.75 kHz or 15 kHz UL sub-carrier spacing							

TABLE 2.23.1-4, ALTERNATIVE LOW- AND HIGH-GUARD BAND TEST CHANNELS FOR BAND 85 WITH NS_04 SIGNALING:

Test Frequency ID	E-UTRA Cell Bandwidth [MHz]	NUL	MUL	Frequency of Uplink [MHz]	NDL	MDL	Frequency of Downlink [MHz]
Low Range	Any	134004	0	698.2000	70368	1	728.2075
High Range	Any	134180	0	715.8000	70544	-2	745.7925
The test channels above are applicable to either 3.75 kHz or 15 kHz UL sub-carrier spacing							

2.23.2 Applicability of Alternative NB-IoT Guard Band Test Channels

The NB-IoT guard band test channels above have been standardized by 3GPP RAN5 in 36.508 Release 17, Clause 8.1.3.1. The standardized test frequencies listed in Section 2.23.1 shall be utilized by PTCRB ATLs when executing guard band conformance tests for any NB-IoT device capable of operating in any of the four bands specified in Section 2.23.1.

The PTCRB Primary Test Laboratory shall be responsible for ensuring that all testing executed against NB-IoT devices operating in the guard band of Band 12, 13, 71 and 85, including tests performed by other ATLs, have been executed using the same lower and upper guard band test channels in each band.

Section 2.23 of NAPRD.03 shall be deleted once all ATL NB-IoT test platforms have been updated to comply with 3GPP TS 36.508 Release 17 and their associated guard band test cases validated in Bands 12, 13, 71 and 85.

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 LTE-M and/or NB-IoT UICC Test Case Applicability

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 per the device's PICS.

Section 3 Application Enablers Evaluation, General Information

This section defines the PTCRB's requirements for the certification of the Application Enablers implemented in the device.

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-to-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 Multimedia Messaging Service (MMS) (Deleted)

3.2.2 Video Telephony (VT) (Deleted)

3.2.3 Instant Messaging Presence Service (IMPS) (Deleted)

3.2.4 Push to Talk over Cellular (PoC) (Deleted)

3.2.5 Java (Deleted)

3.2.6 Device Management (Deleted)

3.2.7 Secure User Plane Location (SUPL)

3.2.7.1 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.

https://www.openmobilealliance.org/release/SUPL/ETS/

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: https://www.openmobilealliance.org/release/SUPL/V1_0-20070615-A/

SUPL 2.0: https://www.openmobilealliance.org/release/SUPL/V2_0_2-20140721/

3.2.8 Browsing 2.3 (Deleted)

3.2.9 FUMO (Deleted)

3.2.10 SCOMO (Deleted)

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 *“EN Single prio”* and *“NR Single prio”* to Clause 2.7.10 d) Added *“Table 2.7.10-1 “EN and NR Single Prio Band Hierarchy”* 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	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
December 2021	6.7	a) Added SDL bands in table 2.8-3A and table 2.8-4.2 for E-UTRA and NR b) Removed FUMO requirements in Section 2.3.18 c) Updated Section 2.23 NB-IoT Guard Band Test Channels d) Removed GERAN content in Sections 2.8.1, 2.12.1 and 2.17 e) Updated Section 2.9.5, including the addition of Band 85 f) Updated Section 2.7.10 and Table 2.7.10-1 to bearer bands test requirement g) Removed “following exceptions” in Section 2.3.8 given that exceptions are no longer applicable to this subsection h) Changed referenced versions to Current Version in Sections 2.3.9 and 2.3.10 i) Removed “Recently Standardized” within Section 2.23.1 as this term is no longer applicable to this subsection j) Changed all instances of “Void” to “Deleted”
March 2022	6.8	a) Edited PVG Permanent Reference Documents to include [213] and edit previous names b) Updated Table 2.7.2-1 PTCRB TC Database Parameter Field Naming Rules c) Updated Section 2.7.10 to proper Bearers d) Updated Section 2.9.6 to correct version of 3GPP e) Updated Section 2.12 to include exception f) Deleted Section 2.13 AT-Command Assessment Requirements g) Updated Section 3.2.6 to include correct links and OMA-ETS-DM evaluations
June 2022	6.9	a) Added Section 2.12.10 UE Capability Audit. device with GEA1 Disabled b) Updated Section 2.7.11 Special Rules and Exception
September 2022	6.10	a) Updated Section 2.8 to replace tables 2.8-1 to 9 with a single table 2.8-1 listing all PTCRB Bands by airlink technology, frequency range and/or band b) Added informative Table 2.8-2 proposing PTCRB Band n77 sub-band names

Date	Version	Description
December 2022	6.11	a) Updated Section 2.9.1 to include Table 2.9.1-1 which lists all GSM, GPRS. EGPRS, UMTS, E-UTRA and NR bands for which OTA testing is required b) Updated Section 2.9.5 to explicitly state that the overlapping band requirements for the RATs and bands listed in Table 2.9.1-1 apply to OTA performance testing, GNSS and conformance and performance testing per CTIA OTA 01.51 and RSE conformance testing per NAPRD03 Section 2.9,7 c) Deleted Section 2.3.14 OMA DM d) Deleted Section 3.2.6 Device Management (DM)
April 2023	6.12	a) Updated Table 2.7.2-1 descriptions to align with PTCRB TC Database b) Updated Table 2.9.1-1 bulleted notes below to numbered sections in 2.9.5 and 2.9.6 c) Updated Sections 2.9.1 through 2.9.8 bulleted requirements to numbered paragraphs d) Deleted Section 2.10 LTE/LTE Carrier Aggregation (CA) Interoperability Testing e) Removed reference to specific Band 66 LTE-CA combinations in Section 2.20 f) Updated document to follow corrected capitalization and grammar as ongoing task g) Updated RAT terminology through document