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AUSTRALIAN STANDARD

AS/CA S042.5:2022

Requirements for connection to an air interface of a Telecommunications Network— Part 5: IMT-2020 Customer Equipment

Australian STANDARD

Australian Standard – *Requirements for connection to an air interface of a Telecommunications Network— Part 5: IMT-2020 Customer Equipment*

This Standard was issued in draft form for public comment as DR AS/CA S042.5:2021

First published as AS/CA S042.5:2022 on 8 March 2022

ISBN: 1 74000 468 X

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FOREWORD

General

This Standard was prepared by Communications Alliance WC94 : *IMT-2020 Customer Equipment* Working Committee. It is one of a series of Telecommunication Standards developed under the Memorandum of Understanding between the Australian Communications Authority (ACA) and the Australian Communications Industry Forum (ACIF).

Note: On 1 July 2005 the ACA became the Australian Communications and Media Authority (ACMA) and the Memorandum of Understanding continues in effect as if the reference to the ACA were a reference to ACMA.

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This Standard is the result of a consensus among representatives on the Communications Alliance Working Committee to produce it as an Australian Standard.

The requirements in this Standard are consistent with the aims of s376 of the *Telecommunications Act 1997*. Specifically these aims are—

(a) protecting the integrity of a Telecommunications Network or facility;

(b) protecting the health and safety of persons;

(c) ensuring access to an Emergency Call Service (ECS); and

(d) ensuring interoperability with a Standard Telephone Service (STS).

It should be noted that some Customer Equipment (CE) may also need to comply with requirements in other Standards or other Parts of this Standard.

The Standard should be read in conjunction with *AS/CA S042.1: General.*

Applicable electrical safety Standards, EMC, Radiocommunications and EMR Standards may apply under Commonwealth or State/Territory laws, or both.

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Australian Standards (AS/ACIF and AS/CA Standards) developed by Communications Alliance, are updated according to the needs of the industry, by amendments or revision. Users of these Standards should make sure that they possess the latest amendments or editions. Representations concerning the need for a change to this AS/CA Standard should be addressed to—

The Project Manager
Customer Equipment and Cable Reference Panel
Communications Alliance
PO Box 444
Milsons Point NSW 1565

Regulatory notice

The 2022 version of AS/CA S042.5 is intended to be mandated by a replacement of the ACMA *Telecommunications (Mobile Equipment Air Interface) Technical Standard 2018* (the 2018 ACMA Standard).

Details on current compliance arrangements can be obtained from the ACMA website at http://www.acma.gov.au or by contacting the ACMA below at:

Australian Communications and Media Authority
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Law Courts PO
Melbourne VIC 8010
Australia

Telephone: +61 3 9963 6800
Facsimile: +61 3 9963 6899
TTY: +61 3 9963 6948

INTRODUCTION

This introduction for the AS/CA S042.5 ***Requirements for connection to an air interface of a Telecommunications Network— Part 5: IMT-2020 Customer Equipment*** Standard is not an authoritative section of this Standard and is only provided as guidance for the user of the Standard to outline its objectives, and the factors that have been taken into account in its development.

The reader is directed to the clauses of this Standard for the specific requirements and to the ACMA for the applicable telecommunications labelling and compliance arrangements.

Note: Further information on the telecommunications labelling and compliance arrangements can be found in *the Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015* (the TLN) can be obtained from the ACMA website at www.acma.gov.au.

The objective of Part 5 is to provide the basic compliance requirements and associated test methods for IMT-2020 CE in order to comply with the regulatory arrangements for such CE in Australia.

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TABLES

1 INTERPRETATIVE GUIDELINES

1.1 Categories of requirements

This Standard contains mandatory requirements as well as provisions that are recommendatory only. Mandatory requirements are designated by the words '**shall**' or '**shall not**'. All other provisions are voluntary.

1.2 Compliance statements

Compliance statements, in italics, suggest methodologies for demonstrating CE's compliance with the requirements.

1.3 Definitions, expressions and terms

If there is any conflict between the definitions used in this Standard and the definitions used in the *Telecommunications Act 1997*, the definitions in the Act take precedence.

1.4 Notes

Text denoted as 'Note' is for guidance in interpretation and is shown in smaller size type.

1.5 References

(a) Applicable editions (or versions) of other mandatory documents referred to in this Standard are specified in Section 3: REFERENCES. The bibliography contains information about other publications referred to in this Standard e.g. publications only referred to in notes and informative appendices.

(b) If a document refers to another document, the other document is a sub-referenced document.

(c) Where the edition (or version) of the sub-referenced document is uniquely identified in the reference document, then that edition (or version) applies.

(d) Where the edition (or version) of the sub-referenced document is not uniquely identified in the reference document, then the applicable edition (or version) is that which is current at the date the reference document is legislated under the applicable regulatory framework, or for a non- legislated document, the date upon which the document is published by the relevant standards organisation.

(e) A number in square brackets '[ ]' refers to a document listed in Section 3: REFERENCES.

1.6 Units and symbols

In this Standard the International System (SI) of units and symbols is used in accordance with Australian Standard AS ISO 1000 [1].

1.7 Parts of Standards

CE scoped by this Standard is to comply with the applicable technology-specific Part(s) of this Standard.

2 SCOPE

2.1 This Standard applies to IMT-2020 CE. It defines the technical conditions and requirements for IMT CE that is designed or intended for use in connection with an IMT-2020 public mobile telecommunications service (PMTS) and is an addressable device.

Note: In the context of this scope, CE intended for connection to a service includes CE capable of connection to a service.

2.2 This Standard applies to IMT CE based upon the following IMT-2020 technologies:

(a) 5G New Radio; and

(b) 5G New Radio and E-UTRA (LTE).

2.3 CE is not excluded from the scope of this Standard by reason only that it is capable of performing functions additional to those described in this Standard.

3 REFERENCES

For dated references, only the edition cited applies. However, parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

For undated references, the latest edition of the referenced document (including any amendments) applies. For ETSI Standards that are issued in Releases, the latest version of the relevant Release applies.

	Publication	Title
	Australian Standards	
[1]	AS ISO 1000 -1998	The international System of Unit (SI) and its application.
	ETSI publications	
[2]	ETSI TS 122 016 V15.0.0 (2018-07)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; International Mobile station Equipment Identities (IMEI) (3GPP TS 22.016 version 15.0.0 Release 15)
[3]	ETSI TS 133 501 V15.10.0 (2020-11)	5G; Security architecture and procedures for 5G System (3GPP TS 33.501 version 15.10.0 Release 15)
[4]	ETSI TS 138 101-1 V15.7.0 (2019-10)	5G; NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone (3GPP TS 38.101-1 version 15.7.0 Release 15)
[5]	ETSI TS 138 101-2 V15.7.0 (2019-10)	5G; NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone (3GPP TS 38.101-2 version 15.7.0 Release 15)
[6]	ETSI TS 138 101-3 V15.7.0 (2019-10)	5G; NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios (3GPP TS 38.101-3 version 15.9.0 Release 15)
[7]	ETSI TS 138 321 V15.10.0 (2020-11)	5G; NR; Medium Access Control (MAC) protocol specification (3GPP TS 38.321 version 15.10.0 Release 15)

	Publication	Title
[8]	ETSI TS 138 322 V15.5.0 (2019-05)	5G; NR; Radio Link Control (RLC) protocol specification (3GPP TS 38.322 version 15.5.0 Release 15)
[9]	ETSI TS 138 323 V15.7.0 (2020-11)	5G; NR; Packet Data Convergence Protocol (PDCP) specification (3GPP TS 38.323 version 15.7.0 Release 15)
[10]	ETSI TS 138 331 V15.11.0 (2020-11)	5G; NR; Radio Resource Control (RRC); Protocol specification (3GPP TS 38.331 version 15.11.0 Release 15)
[11]	ETSI TS 138 521-1 V15.3.0 (2019-07)	5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Range 1 standalone (3GPP TS 38.521-1 version 15.3.0 Release 15)
[12]	ETSI TS 138 521-2 V15.3.0 (2019-07)	5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Range 2 standalone (3GPP TS 38.521-2 version 15.3.0 Release 15)
[13]	ETSI TS 138 521-3 V15.3.0 (2019-07)	5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios (3GPP TS 38.521-3 version 15.3.0 Release 15)
[14]	ETSI TS 138 523-1 V15.4.0 (2019-07)	5G; 5GS; User Equipment (UE) conformance specification; Part 1: Protocol (3GPP TS 38.523-1 version 15.4.0 Release 15)
[15]	ETSI TS 138 523-2 V15.4.0 (2019-07)	5G; 5GS; User Equipment (UE) conformance specification; Part 2: Applicability of protocol test cases (3GPP TS 38.523-2 version 15.4.0 Release 15)
[16]	ETSI TS 138 523-3 V15.6.0 (2020-01)	5G; 5GS; User Equipment (UE) conformance specification; Part 3: Protocol Test Suites (3GPP TS 38.523-3 version 15.6.0 Release 15)

4 ABBREVIATIONS AND DEFINITIONS

For the purposes of this Standard, the following abbreviations, acronyms and definitions and those of Part 1 apply.

4.1 Abbreviations

CA	Carrier Aggregation
EN-DC	E-UTRA/NR Dual Connectivity
FR1	Frequency Range 1
FR2	Frequency Range 2
NR-DC	New Radio Dual Connectivity
SUL	Supplementary uplink

4.2 Definitions

4.2.1 Carrier Aggregation (CA)

Carrier Aggregation is the aggregation of two or more LTE component carriers in the downlink, uplink or both, in order to support wider transmission bandwidths. FDD and TDD LTE component carriers in both licensed and unlicensed spectrum can be part of any Carrier Aggregation combination.

4.2.2 Frequency Range 1 (FR1)

The frequency band 410 MHz to 7.125 GHz.

Note: Refer to ETSI TS 138 101-1 [4].

4.2.3 Frequency Range 2 (FR2)

The frequency band 24.25 to 52.6 GHz.

Note: Refer to ETSI TS 138 101-2 [5].

4.2.4 Supplementary uplink (SUL)

CE configured with two uplink carriers for one downlink carrier of the same cell.

Note: This use here of ‘carriers’ is about carrier frequencies and is not the regulatory term ‘Carrier’ defined in legislation.

4.2.5 E-UTRA/NR Dual Connectivity EN-DC

CE connected to E-UTRA access as a master node and 5G NR access as a secondary node.

4.2.6 NR Dual Connectivity NR-DC

CE connected to two different 5G NR accesses, one as a master node and the other as a secondary node.

5 REQUIREMENTS

5.1 5G NR

5.1.1 Applicability

The requirements in Clause 5.1 are applicable to CE based upon 5G NR technologies.

5.1.2 IMEI/PEI security

CE using 3GPP technologies excluding CE for which PEI is the equipment identifier **shall** comply with IMEI security requirements of ETSI TS 122 016 [2].

CE using 3GPP technologies for which PEI is the equipment identifier **shall** comply with PEI security requirements of ETSI TS 133 501[3] and IMEI security requirements of ETSI TS 122 016 [2].

Note: This requirement has been reproduced from Part 1 to avoid a potential compliance gap during the transition period of the applicable Standards. It will be removed from Part 5 during the next revision of this Part.

Compliance with Clause 5.1.2 should be demonstrated by way of a manufacturer's DoC.

5.1.3 Core protocol specifications

CE **shall** comply with the applicable mandatory requirements of the following ETSI Core Specifications:

(a) ETSI TS 138 321 [7]

(b) ETSI TS 138 322 [8]

(c) ETSI TS 138 323 [9]

(d) ETSI TS 138 331 [10]

Note: The applicable mandatory requirements mean the relevant mandatory requirements in the ETSI specifications which have been implemented in the CE and commercially deployed by the manufacturer.

Compliance with Clause 5.1.3 should be demonstrated by way of a manufacturer's DoC for the applicable mandatory requirements.

Note 1: Compliance with Clause 5.1.3 should be demonstrated by way of a manufacturer's DoC for the applicable mandatory requirements.

Note 2: Formal conformance test cases covering mandatory requirements are defined in ETSI TS 138 523-1 [14], ETSI TS 138 523-2 [15] and ETSI TS 138 523-3 [16].

5.2 Operation Bands

Requirements for CE capable of operating in all or any part of the frequency bands given in Tables 1 to 4 are defined in Clauses 5.3 to 5.6.

TABLE 1
5G NR FR1 Bands

Band No.	Band frequency
FDD Band n1	2.1 GHz
FDD Band n3	1.8 GHz
FDD Band n5	850 MHz
FDD Band n7	2.6 GHz
FDD Band n8	900 MHz
FDD Band n28	700 MHz
TDD Band n40	2.3 GHz
TDD Band n78	3.6 GHz

TABLE 2
5G NR FR2 Bands

Band No.	Band frequency
TDD Band n257	26.50 – 29.50 GHz
TDD Band n258	24.25 – 27.50 GHz
TDD Band n261	27.50 – 28.35 GHz

TABLE 3
5G NR SUL Bands

Band No.	Band frequency
FDD Band n81	880 - 915 MHz
FDD Band n82	832 - 862 MHz

TABLE 4
E-UTRA Bands in EN-DC

Band No.	Band frequency
FDD Band 1	2.1 GHz
FDD Band 3	1.8 GHz
FDD Band 5	850 MHz
FDD Band 7	2.6 GHz
FDD Band 8	900 MHz
FDD Band 28	700 MHz
TDD Band 38	2.6 GHz
TDD Band 40	2.3 GHz
TDD Band 42	3.5 GHz

5.3 5G NR FR1 standalone

5.3.1 Single Carrier

CE used in the bands listed in Table 1 **shall** comply with the mandatory transmitter and receiver requirements of Clauses 6 and 7 of ETSI 138 101-1 [4] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.3.1 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements of ETSI TS 138 101-1 [4] which are designated by the words 'shall' or 'shall not'.

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements are defined in ETSI TS 138 521-1 [11]

5.3.2 Carrier Aggregation (CA)

CE used in any combination of bands listed in Table 1 for Carrier Aggregation **shall** comply with the mandatory transmitter and receiver requirements for Carrier Aggregation of Clauses 6 and 7 of ETSI 138 101-1 [4] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.3.2 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Carrier Aggregation *of ETSI TS 138 101-1 [4] which are designated by the words 'shall' or 'shall not'.*

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Carrier Aggregation are defined in ETSI TS 138 521-1 [11]

5.3.3 Supplemental Uplink (SUL)

CE used in the SUL bands listed in Table 3 **shall** comply with the mandatory transmitter and receiver requirements for SUL of Clauses 6 and 7 of ETSI 138 101-1 [4] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.3.3 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for SUL of ETSI TS 138 101-1 [4] which are designated by the words 'shall' or 'shall not'.

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for SUL are defined in ETSI TS 138 521-1 [11]

5.4 5G NR FR2 standalone

5.4.1 Single Carrier

CE used in the bands listed in Table 2 **shall** comply with the mandatory transmitter and receiver requirements of Clauses 6 and 7 of ETSI 138 101-2 [5] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.4.1 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements of ETSI TS 138 101-2 [5] which are designated by the words 'shall' or 'shall not'.

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements are defined in ETSI TS 138 521-2 [12]

5.4.2 Carrier Aggregation (CA)

CE used in any combination of bands listed in Table 2 for Carrier Aggregation **shall** comply with the mandatory transmitter and receiver requirements for Carrier Aggregation of Clauses 6 and 7 of ETSI 138 101-2 [5] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.4.2 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Carrier Aggregation *of*

ETSI TS 138 101-2 [5] which are designated by the words 'shall' or 'shall not'.

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Carrier Aggregation *are defined in ETSI TS 138 521-2 [12]*

5.5 5G NR FR1 and 5G NR FR2 Interworking with standalone

CE used in any dual connectivity configuration of bands listed in Tables 2 and 4 for Inter-band 5G NR-DC including both FR1 and FR2 **shall** comply with the mandatory transmitter and receiver requirements for Inter-band 5G NR-DC including both FR1 and FR2 of Clauses 6 and 7 of ETSI 138 101-3 [6] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.5.1 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Inter-band 5G NR-DC including both FR1 and FR2 *of ETSI TS 138 101-3 [6] which are designated by the words 'shall' or 'shall not'.*

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Inter-band NR-DC including both FR1 and FR2 *are defined in ETSI TS 138 521-3 [13]*

5.6 5G NR FR1 and 5G NR FR2 Interworking with non-standalone

5.6.1 Inter-band EN-DC within FR1

CE used in any dual connectivity configuration of bands listed in Tables 1 and 4 for Inter-band EN-DC within FR1 **shall** comply with the mandatory transmitter and receiver requirements for Inter-band EN-DC within FR1 of Clauses 6 and 7 of ETSI 138 101-3 [6] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.6.1 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Inter-band EN-DC within FR1 *of ETSI TS 138 101-3 [6] which are designated by the words 'shall' or 'shall not'.*

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Inter-band EN-DC within FR1 are defined in ETSI TS 138 521-3 [13]

5.6.2 Inter-band EN-DC including FR2

CE used in any dual connectivity configuration of bands listed in Tables 2 and 4 for Inter-band EN-DC within FR2 **shall** comply with the mandatory transmitter and receiver requirements for Inter-band

EN-DC within FR2 of Clauses 6 and 7 of ETSI 138 101-3 [6] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.6.2 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Inter-band EN-DC within FR2 *of ETSI TS 138 101-3 [6] which are designated by the words 'shall' or 'shall not'.*

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Inter-band EN-DC within FR2 are defined in ETSI TS 138 521-3 [13]

5.6.3 Inter-band EN-DC including both FR1 and FR2

CE used in any dual connectivity configuration of bands listed in Tables 1, 2 and 4 for Inter-band EN-DC including both FR1 and FR2 **shall** comply with the mandatory transmitter and receiver requirements for Inter-band EN-DC including both FR1 and FR2 of Clauses 6 and 7 of ETSI 138 101-3 [6] for RF compatibility, network integrity and interoperability with the STS.

Compliance with Clause 5.6.3 should be demonstrated by way of a—

(a) test report; or

(b) manufacturer's DoC against the mandatory transmitter and receiver requirements for Inter-band EN-DC including both FR1 and FR2 *of ETSI TS 138 101-3 [6] which are designated by the words 'shall' or 'shall not'.*

Note: Formal conformance test cases covering mandatory transmitter and receiver requirements for Inter-band EN-DC including both FR1 and FR2 *are defined in ETSI TS 138 521-3 [13]*

6 TESTING

6.1 Verification of compliance with requirements

Compliance with all mandatory requirements in this AS/CA Standard is to be verified. This may be done by direct measurement, modelling and analysis, operation or inspection.

Methods for demonstrating compliance of CE with the requirements clauses specified in this AS/CA Standard are described in the requirements clauses and in the referenced Standards.

Verification of compliance with the referenced standards may be confirmed by test reports to later versions of the referenced standards provided that all clauses of the referenced standards are shown to be met.

Alternative methods of demonstrating compliance to those described may be used if the risk of passing non-compliant CE is not increased because of increased measurement uncertainty.

PARTICIPANTS

The Working Committee that developed this Standard consisted of the following organisations:

Organisation	Membership
ACMA	Non-Voting
Apple	Voting
Certification Body Australia	Voting
Comtest Laboratories	Voting
HMD Global	Voting
Motorola Mobility Australia	Voting
nbn	Voting
Samsung	Voting
Singtel Optus	Voting
Telstra	Voting

This Working Committee was chaired by Steve Vodicka of Telstra. Mike Johns of Communications Alliance provided project management support.

Communications Alliance was formed in 2006 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

In pursuing its goals, Communications Alliance offers a forum for the industry to make coherent and constructive contributions to policy development and debate.

Communications Alliance seeks to facilitate open, effective and ethical competition between service providers while ensuring efficient, safe operation of networks, the provision of innovative services and the enhancement of consumer outcomes.

It is committed to the achievement of the policy objective of the *Telecommunications Act 1997* - the greatest practicable use of industry self-regulation without imposing undue financial and administrative burdens on industry.

Published by:
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ISBN: 1 74000 468 X