

**COMMUNICATIONS
ALLIANCE LTD**



AUSTRALIAN STANDARD

Requirements for connection to an air interface
of a Telecommunications Network—
Part 1: General

Australian Standard – Requirements for connection to an air interface of a Telecommunications Network— Part 1: General

This Standard was issued in draft form for public comment as DR AS/CA S042.1:2020.

First published as AS/ACIF S042.1:1999

Second edition as AS/ACIF S042.1:2006

Third edition as AS/ACIF S042.1:2008

Fourth edition as AS/CA S042.1:2010

Fifth edition as AS/CA S042.1:2015, published on 14 August 2015

Sixth edition as AS/CA S042.1:2018, published on 12 April 2018

Seventh edition as AS/CA S042.1:2020, published on 15 October 2020

ISBN: 1 74000 462 0

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FOREWORD

General

This Standard was prepared by Communications Alliance and most recently revised by the WC88 : **Advance Mobile Location for Mobile Devices** 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.

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 was a reference to the ACMA.

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This Standard is a revision of AS/CA S042.1: 2018 *Requirements for connection to an air interface of a Telecommunications Network— Part 1: General*.

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 emergency services; and
- (d) ensuring interoperability with a Standard Telephone Service.

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.

AS/CA S042 consists of the following Parts under the general title *Requirements for connection to an air interface of a Telecommunications Network*:

- Part 1: General
- Part 2: CDMA (IS-95) (withdrawn)
- Part 3: GSM Customer Equipment
- Part 4: IMT Customer Equipment

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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 2020 version of AS/CA S042.1 is mandated by the ACMA *Telecommunications (Mobile Equipment Air Interface) Technical Standard 2018* and comes into force on the date it is published. Until that date AS/CA S042.1:2018 remains in force.

The transition period for AS/CA S042.1:2020 is specified in the ACMA *Telecommunications (Mobile Equipment Air Interface) Technical Standard 2018*.

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
PO Box 13112
Law Courts PO
Melbourne VIC 8010
Australia

Telephone: 1800 850 115 (Australia)
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Facsimile: +61 3 9963 6899
Email: info@acma.gov.au

Introduction

This introduction for the AS/CA S042.1:2020 **Requirements for connection to an air interface of a Telecommunications Network— Part 1: General** 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, the factors that have been taken into account in its development and to list the principal differences between the new and the previous edition.

The reader is directed to the clauses of this Standard for the specific requirements and to the Australian Communications and Media Authority (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) Amendment Instrument 2018* (the TLN). The TLN can be obtained from the ACMA website at www.acma.gov.au.

The objective of this Standard is to provide the requirements and test methods for customer equipment for use in connection with a PMTS or a Satellite Service in order to meet the regulatory arrangements for such equipment in Australia. Additional requirements for specific technologies are addressed in other Parts of this Standard.

The objective of this revision is to add requirements for CE to support Advanced Mobile Location (AML).

The principal differences between this edition of AS/CA S042.1 and the previous edition are:

- (i) updates to the references (Section 3);
- (ii) adding the terms 'Advanced Mobile Location' and 'Mobile Carrier' and introducing the appropriate definition (Section 4);
- (iii) adding abbreviations for 5G (NR NSA, NR SA & VoNR) in Abbreviations and Definitions (Section 4) and Test calls for Emergency service access (Clause 6.2);
- (iv) adding requirements for CE to support Advanced Mobile Location (AML) (Section 5);
- (v) amending the requirements for CE used in connection with a PMTS (Clause 5.2); and
- (vi) amending the test methods for call procedures (Clause 6.2).

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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 documents referred to in this Standard are specified in Section 3: REFERENCES.
- (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 Customer Equipment (CE) that is designed or intended for connection to:
 - (a) a PMTS and is an addressable device; or
 - (b) a Satellite Service and is an addressable device;or both.
- 2.2 This Standard does not apply to CE which is not an addressable device such as GPS terminal and satellite navigation system.
- 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.
- 2.4 For additional technical requirements applying to a particular CE, this Standard should be read in conjunction with those Standards listed in the REFERENCES of 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.

	Publication	Title
	Australian Standards	
[1]	AS ISO 1000-1998	The international System of Unit (SI) and its application.
	AS/CA Standards	
[2]	AS/CA S003.1:2010	Requirements for Customer Access Equipment for connection to a Telecommunications Network Part 1: General http://commsalliance.com.au/Documents/all/Standards/s003_1
[3]	AS/CA S004:2013	Voice performance requirements for Customer Equipment http://commsalliance.com.au/Documents/all/Standards/s004
	Communications Alliance Codes	
[4]	C536:2020	Emergency Call Service Requirements Industry Code (incorporating Amendment No.1/2015)
	Communications Alliance Guidelines	
[5]	G616:2013	Acoustic safety for telephone equipment
[6]	G557.6:2019	Location Information for Emergency Calls Part 6: Advanced Mobile Location (AML)
	IEC Standard	
[7]	IEC 61672-1:2013	Electroacoustics – Sound level meters – Part 1: Specifications

	Publication	Title
ITU-R Recommendations		
[8]	M.2083-0 (09/2015)	IMT Vision - "Framework and overall objectives of the future development of IMT for 2020 and beyond"
[9]	M.1224-1 (03/2012)	Vocabulary of terms for International Mobile Telecommunications (IMT)
[10]	M.1457-14 (01/2019)	Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)
ITU-T Recommendations		
[11]	P.57 (12/11)	Artificial ears
[12]	X.509 (10/16)	Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frameworks
ETSI Standards & Reports		
[13]	ETSI TR 102 300-5 V1.4.1 (2015-06)	Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Designers' guide Part 5: Guidance on numbering and addressing
[14]	ETSI TS 103 383	Smart Cards; Embedded UICC; Requirements Specification;
[15]	ETSI TS 103 625 V1.1.1 (2019-12)	Emergency Communications (EMTEL); Transporting Handset Location to PSAPs for Emergency Calls - Advanced Mobile Location
[16]	ETSI TS 122 016 V14.0.0 (2017-03)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; International Mobile station Equipment Identities (IMEI) (3GPP TS 22.016 version 14.0.0 Release 14)
[17]	ETSI TS 122 101 V14.6.0 (2017-03)	Universal Mobile Telecommunications System (UMTS); LTE; Service aspects; Service principles (3GPP TS 22.101 version 14.6.0 Release 14)
[18]	ETSI TR 121 905 V14.0.0 (2017-03)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Vocabulary for 3GPP Specifications (3GPP TR 21.905 version 14.0.0 Release 14)

	Publication	Title
[19]	ETSI TS 124 008 V13.8.0 (2017-01)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 13.8.0 Release 13)
[20]	ETSI TS 122 022 V14.0.0 (2017-03)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Personalisation of Mobile Equipment (ME); Mobile functionality specification (3GPP TS 22.022 version 14.0.0 Release 14)
[21]	ETSI TS 124 229 V14.4.0 (2017-07)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 14.4.0 Release 14)
[22]	ETSI TS 124 301 V13.8.0 (2017-01)	Universal Mobile Telecommunications System (UMTS); LTE; Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 (3GPP TS 24.301 version 13.8.0 Release 13)
[23]	ETSI TS 131 111 V11.13.0 (2017-01)	Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Universal Subscriber Identity Module (USIM) Application Toolkit (USAT) (3GPP TS 31.111 version 11.13.0 Release 11)
[24]	ETSI TS 136 355 V15.6.0 (2020-01)	LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP) (3GPP TS 36.355 version 15.6.0 Release 15)
[25]	ETSI TS 137 571-1 V15.5.0 (2019-05)	Universal Mobile Telecommunications System (UMTS); LTE; Universal Terrestrial Radio Access (UTRA) and Evolved UTRA (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification (3GPP TS 37.571-1 version 15.3.0 Release 15)

	Publication	Title
	3GPP Publications	
[26]	3GPP TS 23.003 V15.0.0 (2017-06)	Technical Specification Group Core Network and Terminals; Numbering, addressing and identification
	Other publications	
[27]	IR.51	GSMA Permanent Reference Document IMS Profile for Voice, Video and SMS over untrusted Wi-Fi access https://www.gsma.com/newsroom/gsmadocuments/
[28]	IR.92	GSMA Permanent Reference Document IMS Profile for Voice and SMS https://www.gsma.com/newsroom/gsmadocuments/
[29]	NG.114	GSMA Permanent Reference Document IMS Profile for Voice, Video and Messaging over 5GS https://www.gsma.com/newsroom/gsmadocuments/

4 ABBREVIATIONS AND DEFINITIONS

For the purposes of this Standard, the following abbreviations and definitions apply:

4.1 Abbreviations

3G	The third generation of mobile phone technologies covered by the ITU IMT family
3GPP	3rd Generation Partnership Project
4G	The fourth generation of mobile phone technologies covered by the ITU IMT family
5G	The fifth generation of mobile phone technologies covered by the ITU IMT family
ACA	Australian Communications Authority
ACMA	Australian Communications and Media Authority
ACIF	Australian Communications Industry Forum
AML	Advanced Mobile Location
AS	Australian Standard
CDMA	Code Division Multiple Access
CE	Customer Equipment
CSFB	Circuit-Switched FallBack
CSP	Carriage Service Provider
DoC	Declaration of Conformity
DRP	(ear) Drum Reference Point
ECC	Emergency Call Code
ECID	Enhanced Cell Identification
ECP	Emergency Call Person
EDGE	Enhanced Data rates for GSM Evolution
eUICC	embedded Universal IC Card
EMC	Electromagnetic Compatibility
EMR	Electromagnetic Radiation
ERP	Ear Reference Point
ETSI	European Telecommunications Standard Institute
E-UTRA	Evolved UTRA. Also referred to as LTE.
FDD	Frequency Division Duplexing
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global System for Mobile Communications
GSMA	GSM Association
GUTI	Globally Unique Temporary Identifier
IC	Integrated Circuit
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity

IMS	IP Multimedia Subsystem
IMSI	International Mobile Subscriber Identity
IMT	International Mobile Telecommunications
ISIM	IMS (IP Multimedia Subsystem) Subscriber Identity Module
ISO	International Standards Organization
ITU	International Telecommunications Union
ITU-R	International Telecommunications Union – Radiocommunications Sector
ITU-T	International Telecommunication Union – Telecommunications Standardization Sector
IVR	Interactive Voice Response
LPP	LTE Positioning Protocol
LTE	Long Term Evolution
MS	Mobile Station
MSISDN	Mobile Services Integrated Services Digital Number
NR	New Radio
NSA	Non-Standalone
OFDMA TDD	Orthogonal Frequency Division Multiple Access TDD
WMAN	Wireless Metropolitan Area Network (also referred to as Mobile WiMAX)
PDA	Personal Digital Assistant
PIDF	Presence Information Data Format
PIN	Personal Identification Number
PKC	Public Key Certificate
PLMN	Public Land Mobile Network
PMTS	Public Mobile Telecommunications Service
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RMS	Root Mean Square
RVA	Recorded Voice Announcement
SA	Standalone
SIM	Subscriber Identity Module
SPL	Sound Pressure Level
SIP	Session Initiation Protocol
SM	Short Message
STS	Standard Telephone Service
TDD	Time Division Duplexing
TLN	Telecommunications Labelling Notice
TMSI	Temporary Mobile Subscriber Identity
TTY	Telephone typewriter/textphone
UICC	Universal IC Card
UMTS	Universal Mobile Telecommunications System
USIM	Universal Subscriber Identity Module

UTRA	Universal Terrestrial Radio Access (also referred to as UMTS)
VoLTE	Voice over LTE
VoNR	Voice over New Radio
VoWiFi	Voice over Wi-Fi
WiMAX	Worldwide Interoperability for Microwave Access

4.2 Definitions

4.2.1 3GPP technologies

3GPP technologies as specified by ETSI and 3GPP.

Note 1: Includes GSM (2G or second generation), GPRS and EDGE (commonly referred to as 2.5G), 3GPP based IMT-2000 and IMT-Advanced (3G or third generation, 4G or fourth generation), IMT-2020 (5G or fifth generation) or technologies such as UTRA and E-UTRA.

Note 2: There are a number of IMT technologies under ITU-R Recommendation M.1457-14 [10] which cannot be classified as being 3GPP technologies such as OFDMA TDD WMAN and CDMA TDD.

4.2.2 Acoustic shock

Any temporary or permanent disturbance of the functioning of the ear, or of the nervous system, which may be caused to the user of a telephone earphone by a sudden sharp rise in the acoustic pressure produced by it.

Note 1: Acoustic shock may include acoustic trauma, but can occur at sound levels considerably lower than those necessary to cause acoustic trauma.

Note 2: This definition is the one used by ETSI and ITU-T.

4.2.3 Addressable device

An addressable device is CE which can be identified by the Telecommunications Network operator for the purposes of two-way communications with that CE.

4.2.4 Advanced Mobile Location

Location information derived by Mobile Station Equipment using its built-in positioning methods, including—

- (a) assisted GNSS;
- (b) GNSS;
- (c) Wi-Fi; or
- (d) cellular.

Refer to ETSI TS 103 625 [15] and G557.6 [6].

- 4.2.5 Air interface
A radio frequency (RF) link between CE and a Telecommunications Network.
- 4.2.6 Carriage Service Provider
Refer to s7 of the *Telecommunications Act 1997*.
- 4.2.7 Carrier
Refer to s7 of the *Telecommunications Act 1997*.
- 4.2.8 Customer Equipment
Refer to s7 of the *Telecommunications Act 1997*.
- 4.2.9 Drum Reference Point
A point located at the end of the ear canal, corresponding to the ear-drum position.
- 4.2.10 Ear Reference Point
A virtual point for geometric reference located at the entrance to the listener's ear, traditionally used for calculating telephonometric loudness ratings.
- 4.2.11 Embedded Universal Integrated Circuit Card
A UICC which is not easily accessible or replaceable, is not intended to be removed or replaced in the terminal, and enables the secure changing of subscriptions.

Note: The term originates from 'embedded UICC'.

Refer to ETSI TS 103 383 [14].
- 4.2.12 Emergency Call
Refer to the *Telecommunications (Emergency Call Service) Determination 2019*.
- 4.2.13 Emergency Service Number
Refer to Part 3 of the *Telecommunications Numbering Plan 2015*.
- 4.2.14 Evolved Universal Terrestrial Radio Access
3GPP technologies definition for Evolved Universal Terrestrial Radio Access (E-UTRA) as specified by 3GPP.

- 4.2.15 Gateway Device
CE that—
- (a) incorporates a Local Port and/or an RF interface; and
 - (b) does not incorporate any keys for the initiating of an Emergency Call to the Emergency Service Numbers or an acoustic coupler device.
- 4.2.16 Globally Unique Temporary Identifier
A unique temporary identity to provide an unambiguous identification of the UE without revealing its permanent identity.
Refer to 3GPP TS 23.003 [26]
- 4.2.17 Handset
The part of the CE which is held by the user in conversation mode and has the acoustic transmitter and receiver transducers mounted in it.
- 4.2.18 Identity module
Means a Subscriber Identity Module (SIM), a Universal Subscriber Identity Module (USIM) or an IMS (IP Multimedia Subsystem) Subscriber Identity Module (ISIM) which is used in the authentication procedures and contains the subscriber identity as well as other subscriber data.
- 4.2.19 International Mobile Equipment Identity
Is a unique number which is allocated to each individual mobile station (MS) equipment in the PLMN and unconditionally implemented by the MS manufacturer at the time of manufacture.
Refer to ETSI TS 122 016 [16].
- 4.2.20 International Mobile Subscriber Identity
Is a string of decimal digits that identifies a unique mobile terminal or mobile subscriber internationally.
Refer to ETSI TR 102 300-5 [13].
- 4.2.21 IMT
Root name that encompasses both IMT-2000, IMT-Advanced and IMT-2020 collectively as specified in ITU-R Recommendation M.1224-1 [9].

Note: The complete specification provides requirements for not only the IMT CE but also includes the infrastructure requirements.

- 4.2.22 **IMT Customer Equipment**
CE that is designed or intended for use in connection with an IMT PMTS. IMT CE based upon UTRA FDD, E-UTRA FDD and E-UTRA TDD technologies has either a Subscriber Identity Module (SIM) or a Universal Subscriber Identity Module (USIM). An IMT CE includes all equipment including terminal adapters required for provision of speech teleservices, bearer and supplementary services.
- 4.2.23 **IMT-2000**
International Mobile Telecommunications-2000 (IMT-2000) as specified by ITU-R Recommendation M.1457-14 [10].
- 4.2.24 **IMT-2020**
International Mobile Telecommunications-2020 (IMT-2020) as specified by ITU-R Recommendation M.2083-0 [8].
- 4.2.25 **IMT-Advanced**
Previously known as systems beyond IMT-2000.
- 4.2.26 **IMS Subscriber Identity Module**
Means an application residing on the UICC that provides access to IP Multimedia Services.
Refer to ETSI TR 121 905 [18].
- 4.2.27 **Local Port**
Refer to AS/CA S003 [2].
- 4.2.28 **Mobile Carrier**
A Carrier that owns or operates a controlled network or controlled facility used to supply a PMTS.
- 4.2.29 **Mobile Station Equipment**
Is the term used in ETSI Publications to describe CE.
- 4.2.30 **Multi-service CE**
CE with STS Access Modes using multiple network interfaces, including, but not limited to, devices with satellite/3GPP or satellite/IMT network interfaces.
- 4.2.31 **New Radio Non-Standalone**
The 3GPP technologies definition for New Radio (NR) Non-Standalone (NSA).
- 4.2.32 **New Radio Standalone**
The 3GPP technologies definition for NR Standalone (SA).

- 4.2.33 Public Key Certificate
- Means the public key of a user, together with some other information, rendered unforgeable by digital signature with the private key of the certification authority which issued it.
- Refer to ITU-T X.509 [12].
- 4.2.34 Public Mobile Telecommunications Service
- Refer to s32 of the *Telecommunications Act 1997*.
- Note: An IMS-based voice over Wi-Fi service is included under the PMTS.
- 4.2.35 Satellite Service
- Refer to the *Telecommunications (Emergency Call Service) Determination 2019*.
- 4.2.36 Standard Telephone Service
- Refer to the *Telecommunications (Consumer Protection and Service Standards) Act 1999*.
- 4.2.37 Standard Telephone Service Access Mode
- Means a CE mode of operation in which:
- (a) a CE is connected to the Telecommunications Network;
 - (b) a CE is able to access a STS which is either a PMTS or a Satellite Service; and
 - (c) the STS access function of the CE is enabled, such that calls can be initiated for the purposes of voice communications.
- Note 1: CE designed for initiating calls to a limited set of numbers, e.g. those connecting to an answering point which is not an ECP, are not considered to be operating in STS Access Mode. These devices typically store pre-programmed numbers.
- Note 2: CE are not considered to be operating in STS Access Mode when they are operating in modes where they are unable to access a STS such as standby mode, screen save mode, games controller mode, camera mode, music player mode, email or messaging mode.
- 4.2.38 Subscriber Identity Module
- Means a physically removable module which is used in the authentication procedures and contains the subscriber identity as well as other subscriber data.
- 4.2.39 Telecommunications Device Identifier
- Refer to s473.1 of the *Criminal Code Act 1995*.
- Note 1: Means an IMEI for CE using 3GPP technologies.
- Note 2: Means a PKC for CE using OFDMA TDD WMAN technologies.

- 4.2.40 Telecommunications Network
Refer to s374(1) of the *Telecommunications Act 1997*.
- 4.2.41 Universal Integrated Circuit Card
A physically secure device, an IC card (or 'smart card'), that can be inserted and removed from the terminal. It may contain one or more applications. One of the applications may be a USIM.
Refer to ETSI TR 121 905 [18].
- 4.2.42 Universal Subscriber Identity Module
An application residing on the UICC used for accessing services provided by mobile networks, which the application is able to register on with the appropriate security.
Refer to ETSI TR 121 905 [18].
- 4.2.43 Universal Terrestrial Radio Access
3GPP technologies definition for Universal Terrestrial Radio Access (UTRA) as specified by 3GPP.
- 4.2.44 User Equipment
Is the term used in ETSI Publications to describe CE.
- 4.2.45 Voice over LTE
A packet voice service over IP based upon LTE for access and IMS for call completion.
Refer to GSMA IR.92 [28].
- 4.2.46 Voice over New Radio (VoNR)
A packet voice service over IP based upon 5G NR for access and IMS for call completion.
Refer to GSMA NG.1 14 [29].
- 4.2.47 Voice over Wi-Fi
A packet voice service over IP based upon Wi-Fi for access and IMS for call completion.
Refer to GSMA IR.51 [27].

5 REQUIREMENTS

5.1 General

5.1.1 Emergency service access

CE designed for voice communications operating in STS Access Mode **shall** allow the initiating of an Emergency Call when connected to or intended for use in connection to the following carriage services:

Emergency service number	PMTS		Satellite services
	3GPP technologies	OFDMA TDD WMAN technology	
000	Initiate	Initiate	Initiate
112	Initiate	-	-

Note 1: These requirements are specifically in reference to the capability of the CE for the initiating of an Emergency Call to the air interface. It does not place requirements on the network side (i.e. on the Carrier) of the air interface or for successful call completion.

Note 2: These requirements include all means of initiating an Emergency Call including, for example, numeric keys, alphanumeric keys, voice, motion and other non-keyed means. The requirements for manual keying are addressed in Clauses 5.2.2.1 (d) and 5.3.2.

Note 3: 000 is the primary Emergency Service Number in Australia for access from both wireline and wireless services. 106 is a secondary Emergency Service Number in Australia which can only be accessed from fixed line services by TTYS. It is for the text-based Emergency Call service for people who are deaf or have hearing or speech impairment. 112 is a secondary Emergency Call service number in Australia which can only be accessed from PMTS employing 3GPP technologies. It is also the international standard emergency service number for PMTS employing 3GPP technologies.

Note 4: Voice communications also includes artificial voice.

Compliance with Clause 5.1.1 should be checked by using the method described in Clause 6.2.

5.1.2 Multi-service CE

Multi-service CE **shall** comply with the requirements applicable to each service.

Note: The requirements described in Clause 5.2 for CE use in connection with a PMTS are not applicable if a multi-service CE is connected to a Satellite Service; and the requirements described in Clause 5.3 for CE use in connection with a Satellite Service are not applicable if a multi-service CE is connected to a PMTS.

Compliance with Clause 5.1.2 of Multi-service CE should be checked using the methods described in Clauses 5.2 and 5.3 for the applicable service.

5.1.3 Gateway Device

CE that functions as a Gateway Device **shall** comply with the requirements of Clauses 5.1.1, 5.1.2 and 5.4.

Note: To initiate a call to Emergency Service Numbers 000 and 106 in STS Access Mode, a Gateway Device may also require the connection of other equipment, such as a PSTN handset via a Local Port, or a cordless phone via an RF interface.

Compliance with Clause 5.1.3 of Gateway Devices should be checked using the methods described in Clauses 5.1.1, 5.1.2 and 5.4.

5.2 CE used in connection with a PMTS

5.2.1 Application

The requirements of Clause 5.2 are applicable to CE connected to or intended for use in connection with a PMTS and operating in STS Access Mode.

5.2.2 Emergency service access

5.2.2.1 Emergency service number

(a) Firmware

- (i) CE using 3GPP technologies **shall** store the Emergency Service Numbers 000 and 112 in its firmware in accordance with ETSI TS 122 101 [17].
- (ii) CE using 3GPP technologies **shall not** store the Emergency Service Number 106 in its firmware.
- (iii) Where an Identity Module is not present in the CE, CE using 3GPP technologies **shall** allow the initiating of an Emergency Call to the Emergency Service Numbers 000 and 112 stored in its firmware in accordance with ETSI TS 122 101 [17].

Compliance with Clause 5.2.2.1(a) should be checked using the method described in Clause 6.2.1.

(b) Mobile identity

- (i) Where an Identity Module is not present in the CE, CE using 3GPP technologies **shall** send an IMEI to the Telecommunications Network when it is initiating an Emergency Call to the Emergency Service Numbers 000 and 112 in accordance with ETSI TS 124 008 [19] and ETSI TS 124 301 [22].
- (ii) Where an Identity Module is present in the CE, CE using 3GPP technologies **shall** send an IMEI to the Telecommunications Network when it is initiating an Emergency Call to the Emergency Service Numbers 000 and 112 in the following call cases:

- (A) Identity Module is blocked as per ETSI TS 124 008 [19] and ETSI TS 124 301 [22].
 - (B) Identity Module is PIN enabled, waiting for PIN input as per ETSI TS 124 008 [19] and ETSI TS 124 301 [22].
 - (C) Identity Module is invalidated by the Telecommunications Network as per ETSI TS 124 008 [19].
 - (D) Incorrect Identity Module inserted as per ETSI TS 122 022 [20].
 - (E) Damaged or faulty Identity Module.
 - (F) IMS Emergency Call without emergency registration as per ETSI TS 124 229 [21].
- (iii) Where an Identity Module is present in the CE, CE using 3GPP technologies **shall** send a TMSI/IMSI/GUTI to the Telecommunications Network when it is initiating an Emergency Call to the Emergency Service Numbers 000 and 112 excluding call cases scoped under Clause 5.2.2.1 (b)(ii) as per ETSI TS 124 008 [19], ETSI TS 124 301 [22] and ETSI TS 124 229 [21].

Note: At time of publication, typical technologies requiring Identity Modules include 3GPP technologies.

Compliance with Clause 5.2.2.1 (b) should be demonstrated by way of a manufacturer's DoC to the applicable Emergency Call related mobile identity requirements (refer to Appendix B in this Standard) in ETSI TS 124 008 [19], ETSI TS 124 301 [22] and ETSI TS 124 229 [21].

(c) ECC field

Where an Identity Module is present in the CE excluding the call cases scoped under Clause 5.2.2.1 (b)(ii) CE **shall**—

- (i) be able to read the ECC field on the Identity Module supplied by a CSP; and
- (ii) allow the initiating of an Emergency Call to the Emergency Service Numbers 000 and 112 stored in the ECC field.

Note: C536 [4] specifies that CSPs must ensure that new Identity Modules supplied by CSPs to their Customers are correctly programmed with 000 and 112 in the ECC field of the Identity Module. There are no requirements in C536 [4] to populate 106 in the ECC field of the Identity Module.

Compliance with Clause 5.2.2.1 (c) should be checked using the method described in Clause 6.2.1.

(d) Numeric keys

By the user manually entering the digits at the time the connection is required, CE that incorporates numeric keys for the primary purpose of initiating calls—

- (i) **shall** allow the initiating of an Emergency Call to the Emergency Service Number 000; and
- (ii) for CE using 3GPP technologies, **shall** allow the initiating of an Emergency Call to the Emergency Service Number 112.

Note 1: Numeric keys include physical buttons and screen-based 'soft' keys found on CE.

Note 2: If numeric keys remain visible under any lock condition (e.g. software or hardware lock) then the requirements of this Clause apply.

Note 3: CE may have means other than numeric keys for call setup, e.g. alphanumeric keys, voice, motion and other non-keyed means. There is no requirement placed on these under Clause 5.2.2.1(d) as these are addressed in Clause 5.1.1.

Compliance with Clause 5.2.2.1(d) should be checked using the method described in Clause 6.2.1.

(e) Emergency call safeguard

When complying with the requirements for emergency service access outlined in Clause 5.2.2, CE should be designed in such a manner to minimise the accidental or unintentional initiation of Emergency Calls.

Note: For a dedicated Emergency Call button, this could be achieved by a two stage process requiring a user to confirm their intention to initiate an Emergency Call prior to the Emergency Call actually being initiated.

Compliance with Clause 5.2.2.1(e) should be checked by operation and inspection.

(f) Locks

When the CE is in any lock or unlock condition, including security code, key lock and blocked Identity Module, CE **shall** either—

- (i) allow the initiating of an Emergency Call to the Emergency Service Numbers 000 and 112; or
- (ii) provide directions for the user to disable the lock where CE prevents initiating of an Emergency Call to the Emergency Service Numbers 000 and 112 when a lock is enabled.

In (f)(ii) the directions for the user to disable the lock **shall** be made available to the user on the CE either before or during an attempt to call the Emergency Service Numbers 000 and 112.

Compliance with Clause 5.2.2.1(f) should be checked using the method described in Clause 6.2.1.

(g) Location – AML within Australia

Where CE has registered on the mobile network used for the Emergency Call and has an operating system that has been designed to support AML and has GNSS functionality:

- (i) CE using 3GPP technologies excluding IMT-2020 based on Voice over New Radio (VoNR) **shall** provide Advanced Mobile Location (AML) information in accordance with AML version 1 in ETSI TS 103 625 [15] except for IMEI and IMSI.
- (ii) Within 25 seconds after successful initiation of an Emergency Call, CE that incorporates AML functionality **shall** initiate a Short Message (SM) containing AML information to the Australian number 1262612626.
- (iii) CE that incorporates AML functionality may initiate additional SMs containing AML information to the Australian number 1262612626 for the duration of the Emergency Call.

Note: Where CE does initiate multiple additional SMs then the CE could do so at intervals of approximately 30 seconds.

- (iv) CE that incorporates AML functionality should provide IMEI and IMSI in the AML SM.

Compliance with Clause 5.2.2(g) should be checked by using the methods described in Clause 6.2.

(h) Location – AML when roaming outside Australia

CE that incorporates AML functionality **shall not** initiate a SM containing AML information to the Australian number 1262612626 when the CE is roaming outside Australia.

Compliance with Clause 5.2.2(h) should be demonstrated by way of a manufacturer's DoC.

(i) Location – non-AML technologies

- (i) When initiating an IMS emergency session, CE using 3GPP technologies should conform to the requirements to convey its location information for an Emergency Call, using the Geolocation header field and the PIDF location object in the initial SIP INVITE request, as specified in section 5.1.6.8.2 and section 5.1.6.8.3 of ETSI TS 124 229 [21].
- (ii) CE using 3GPP technologies should support LTE Positioning Protocol (LPP) in accordance with ETSI TS 136 355 [24].

- (iii) CE using 3GPP technologies should support Enhanced Cell Identification (ECID) positioning in accordance with ETSI TS 137 571-1 [25] to provide the CE's location information for an Emergency Call.

Compliance with Clause 5.2.2(i) should be demonstrated by way of a manufacturer's DoC.

5.2.2.2 Special flags and special signalling

5.2.2.2.1 Emergency service numbers 000 and 112

CE using 3GPP technologies designed for voice communications **shall** activate the Emergency Call procedure for the Emergency Service Number 000 in the same manner as it would initiate the Emergency Call procedure for the Emergency Service Number 112.

Note: This requirement may require the CE, when initiating an Emergency Call to 000, to raise special flags or use special signalling protocols as required by ETSI TS 124 008 [19] that defines the procedure for the initiating of an Emergency Call to the Emergency Service Number 112.

5.2.2.2.2 Emergency service number 106

CE using 3GPP technologies **shall not**—

- (a) treat calls to 106 as Emergency Calls; or
- (b) activate the Emergency Call procedure for calls to 106.

Compliance with Clause 5.2.2.2 should be checked by operation and inspection.

5.3 CE used in connection with a Satellite Service

5.3.1 Application

The requirements of Clause 5.3 are applicable to CE connected to or intended for use in connection with a Satellite Service and operating in STS Access Mode.

5.3.2 Emergency service access

By the user manually entering the digits at the time the connection is required, CE designed for voice communications that incorporates numeric keys for the primary purpose of initiating calls **shall** allow the initiating of an Emergency Call to the Emergency Service Number 000.

Note 1: Numeric keys include physical buttons and screen-based 'soft' keys found on CE.

Note 2: If numeric keys remain visible under any lock condition (e.g. software or hardware lock), then the requirements of this Clause apply.

Note 3: CE may have means other than numeric keys for call setup, e.g. alphanumeric keys, voice, motion and other non-keyed means.

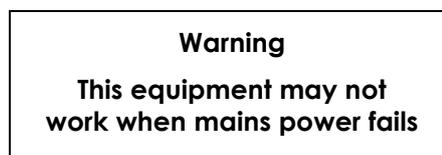
There is no requirement placed on these under Clause 5.3.2 as these are addressed in Clause 5.1.1.

Compliance with Clause 5.3.2 should be checked using the method described in Clause 6.2.2.

5.4 Provision of power-fail advice

Mains-powered CE designed for voice communications **shall** have a warning notice included in or with the CE documentation, if the CE does not continue to operate for more than 30 minutes after the loss of mains power.

Suggested wording for the warning notice is shown below and should also be placed on the outside surface of the CE's packaging.



Compliance with Clause 5.4 may be checked by inspection.

5.5 Acoustic safety

5.5.1 Maximum Sound Pressure Level (SPL)

The maximum RMS Sound Pressure Level (SPL) output for voice communications from the CE **shall** be less than or equal to 120 dBA at the Ear Reference Point (ERP) or the equivalent at the Drum Reference Point (DRP) when any user adjustable receiver volume control is set to maximum and when measured using 'RMS', 'F' or 'Fast' settings of sound level meters as defined in IEC 61672-1 [7] or equivalent short term RMS SPL.

Note 1: The choice of acoustic coupler and artificial ear is to be in accordance with ITU-T Rec. P.57 [11].

Note 2: Conversion between DRP and ERP for narrow band stimuli is to be in accordance with ITU-T Rec. P.57 [11].

Note 3: The requirement in Clause 5.4.1 is based upon the requirements in AS/ACIF S004 [3]. AS/ACIF S004 [3] typically applies to CE used for fixed telephony.

Note 4: Refer to ACIF G616 [5] for additional information related to the use of CE for mobile telephony.

5.5.2 Recommended Maximum Sound Pressure Levels (SPLs) (informative)

5.5.2.1 General

The RMS Sound Pressure Level (SPL) output for all audible outputs other than voice communications from the CE should be less than or equal to 120 dBA at the Ear Reference Point (ERP) or the equivalent at the Drum Reference Point (DRP) when any user adjustable

volume control is set to maximum and when measured using 'RMS', 'F' or 'Fast' settings of sound level meters as defined in IEC 61672-1 [7] or equivalent short term RMS SPL.

Methods to achieve this could include—

- (a) an adaptation of the SPL output based on information about the proximity of the CE and the user; or
- (b) the use of more than one transducer for production of audible output, with the higher SPL output being produced by a transducer not intended to be placed next to or in an ear.

5.5.2.2 SPL output exceeding 120 dBA

Where the RMS SPL output from the CE exceeds 120 dBA at the ERP or the equivalent at the DRP then there should be control of the initial SPL such as a ramping up of the output so the SPL is—

- (a) initially less than or equal to 120 dBA at the Ear Reference Point (ERP) or the equivalent at the Drum Reference Point (DRP);
- (b) rises in increments no greater than 6 dB;
- (c) rises at a rate not greater than 6 dB/second; and
- (d) rises to a maximum within not less than 6 seconds.

Note 1: The choice of acoustic coupler and artificial ear is to be in accordance with ITU-T Rec. P.57 [11].

Note 2: Conversion between DRP and ERP for narrow band stimuli is to be in accordance with ITU-T Rec. P.57 [11].

Note 3: Refer to ACIF G616 [5] for additional information related to the use of CE for mobile telephony.

Note 4: These recommendations arise from a balancing of—

- (i) a need to protect users from CE from acoustic shock, particularly when the CE is located close to a user's ear;
- (ii) the risk of acoustic shock relative to the level of usage of CE (e.g. mobile phones) by the populations; and
- (iii) the utility of CE that can produce high SPLs, particularly in a noisy environment when the CE is not located close to the user.

Note 5: Ramping up of an audible output can provide some protection against the risk of acoustic shock by giving the user the opportunity to move the CE away from their ear before the CE produces its maximum SPL.

Compliance with Clause 5.5 should be checked using the method described in Clause 6.3.

5.6 Telecommunications Device Identifier

CE using—

- (a) 3GPP technologies; or
- (b) OFDMA TDD WMAN technologies

shall have a Telecommunications Device Identifier.

Compliance with Clause 5.6 should be demonstrated by way of a manufacturer's DoC and inspection.

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 Standard are described in Clauses 6.2 and 6.3.

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.

6.2 Test calls for Emergency service access

6.2.1 Making a test call for CE used in connection with a PMTS

6.2.1.1 Identity modules

Where an Identity Module is present in the CE during testing, the Identity Module should—

- (a) be supplied by a CSP;
- (b) be an active Identity Module;
- (c) have the Emergency Service Numbers 000 and 112 stored in the ECC field; and
- (d) be intended for use to access a PMTS operated by a Mobile Carrier.

6.2.1.2 Test configuration for CE

The CE and test environment should be configured as required for—

- (a) each operating state in Clause 5.2.2 requiring test calls, including the operating state where no Identity Module is present;
- (b) accessing PMTS from each of the Mobile Carriers;
- (c) each technology supported by the CE and PMTS including:
 - (i) UTRA;
 - (ii) E-UTRA;
 - (iii) NR NSA;
 - (iv) NR SA; and
 - (v) a Wi-Fi network where VoWiFi calls can be made; and

- (d) no suitable access technology

Note: The expectation, when there is no suitable access technology, is the ability to initiate an Emergency Call is not prevented.

6.2.1.3 Test configuration for Gateway Devices

For Gateway Device test calls, the Gateway Device should be configured as required for—

- (a) each operating state in Clause 5.2.2 requiring test calls, including the operating state where no Identity Module is present;
- (b) accessing PMTS from each of the Mobile Carriers;
- (c) each technology supported by the Gateway Device and by the PMTS including:
 - (i) UTRA;
 - (ii) E-UTRA;
 - (iii) NR NSA;
 - (iv) NR SA; and
 - (v) a Wi-Fi network where VoWiFi calls can be made; and
- (d) no suitable access technology

Note: The expectation, when there is no suitable access technology, is the ability to attempt an Emergency Call is not prevented.

For Gateway Device test calls, the corded or wireless handset connected to CE that functions as a Gateway Device should be configured as required for each operating state in 5.2.2.

6.2.1.4 Information to record prior to test calls

Prior to initiating test calls the tester should check and record information about—

- (a) PMTS supported access technology availability in the test environment and its suitability for voice calls; and
- (b) Wi-Fi availability in the test environment and its suitability for VoWiFi calls

Test calls only apply to CE operating in STS Access Mode.

Note: Test calls are those from Carriers/CSPs, CE suppliers, test laboratories and the ACMA verifying compliance of the CE against the applicable requirements of this Standard.

6.2.1.5 Initiating a test call to the ECP

Test calls for the Emergency Service Numbers should be made to the Emergency Call Person (ECP) for CE used in connection with a PMTS.

Prior to initiating a test call to an Emergency Service Number, the tester should record the—

- (a) time and date of the Emergency Call(s);
- (b) IMSI and IMEI of the CE under test;
- (c) MSISDN of the PMTS used by the CE under test; and
- (d) for AML compliance information regarding the test location, including:
 - (i) latitude;
 - (ii) longitude; and
 - (iii) service address.

6.2.1.6 Response from ECP

If the Emergency Call is supported by the Telecommunications Network supplying the PMTS, successful initiation of an Emergency Call to the Emergency Service Numbers 000 and 112, will be indicated by the connection to either a Recorded Voice Announcement (RVA) or an ECP operator.

Note: At time of publication, the ECP for 000 and 112 is Telstra Corporation Ltd.

6.2.1.7 Response from network

If—

- (a) the Emergency Call is not supported by the Telecommunications Network supplying the PMTS; and
- (b) the Telecommunications Network provides a network response back to the CE, then

successful initiating of an Emergency Call to the Emergency Service Number will be indicated by the appropriate network response.

An appropriate network response is one which confirms that the CE was able to deliver the appropriate information to the air interface for the initiating of an Emergency Call to the Emergency Service Number, e.g. call diverts to a network IVR or RVA or to a network operator in the case of a call to 000 or 112.

6.2.1.8 Test call using SIM with ECC field

Test calls to Emergency Service Numbers should be made to the Emergency Call Person (ECP) for CE used in connection with a PMTS.

The CE should be in both the locked and unlocked states and exclude call cases listed in Clauses 5.2.2.1 (b) (i) and (ii).

Insert an active Identity Module supplied by a CSP and attempt dialling of the Emergency Service Numbers 000 and 112. Verify successful test calls to the ECP.

While the Identity Module remains inserted, perform a third test call to the number 999.

Verify that the Identity Module supplied by a CSP prevents the successful initiation of an Emergency Call, however, a normal call will be initiated.

Test calls only apply to CE operating in STS Access Mode.

Note 1: Test calls are those from Carriers, CE suppliers, test laboratories and the ACMA verifying compliance of the CE against the applicable requirements of this Standard.

Note 2: Identity Modules supplied by a CSP only contain the Emergency Numbers 000 and 112 numbers in the ECC field in accordance with C536 requirements and do not contain any other numbers such as 08, 110, 999, 118 and 119.

6.2.2 Making a test call for CE used in connection with a Satellite Service

6.2.2.1 Test configuration

Test calls for the Emergency Service Numbers should be made to the ECP for CE used in connection with a particular Satellite Service.

If the CE requires an Identity Module for normal operation, then the test calls should be made with an active test Identity Module fitted.

The CE should be in the unlocked state.

The PSTN handset or wireless phone connected to CE that functions as a Gateway Device should be in the unlocked state.

Test calls should be made from CE operating in STS Access Mode.

6.2.2.2 Response from ECP

If the Emergency Call is supported by the Telecommunications Network supplying the Satellite Service, successful initiation of an Emergency Call to the Emergency Service Number will be indicated by the connection of the Emergency Call to either a ECP RVA or an ECP operator in the case of a call to the ECP for 000.

6.2.2.3 Response from network

If the Emergency Call is not supported by the Telecommunications Network supplying the particular Satellite Service and where the Telecommunications Network provides a network response back to the CE, successful initiation of an Emergency Call to the Emergency Service Number will be indicated by the connection to the appropriate network response. This confirms that the CE was able to deliver the appropriate information to the air interface for the initiation of an Emergency Call to the Emergency Service Number,

e.g. call diverts to a network IVR or network operator in the case of a call to 000.

6.2.3 Test call identification

Either—

- (a) "This is [Your Name and Company name] making a Triple Zero test call" or
- (b) "This is [Your Name and Company name] making a Triple Zero test call; please confirm the phone number displayed is OXXXXXXXXX?"

announcement should accompany a test call if the call is taken by an operator at the ECP for 000 and 112.

Note 1: The ECP agent will follow their procedure to direct the test call to a Test Call Recorded Voice Announcement (RVA).

Note 2: The Test Call RVA will then be played back in a loop for a total duration of 2 minutes, this will allow multiple AML SMS to be sent where supported.

6.2.4 AML test call verification

To confirm whether AML data was received by the ECP for the successful Emergency Calls from a PMTS, the CE Supplier, Test House or Carrier/CSP should email the ECP (esap@team.telstra.com) with the—

- (a) phone number/s of the test service used; and
- (b) time/date of Emergency Calls.

The ECP will confirm back via email the following to the tester—

- (a) whether AML data was received via SMS for the Emergency Calls; and
- (b) the AML data received from the CE.

6.2.5 Test call notice

If more than 50 test calls are planned to be made to the ECP for 000 and 112 within a 24-hour period, then the ECP is to be notified in advance of the initiation of the test calls.

Note: Notification to the ECP for 000 and 112 can be via esap@team.telstra.com.

6.3 Acoustic Safety

6.3.1 Maximum RMS output

The maximum RMS output SPL should be measured using the circuit shown in Figure 1.

Note: There is no test required for instantaneous output levels.

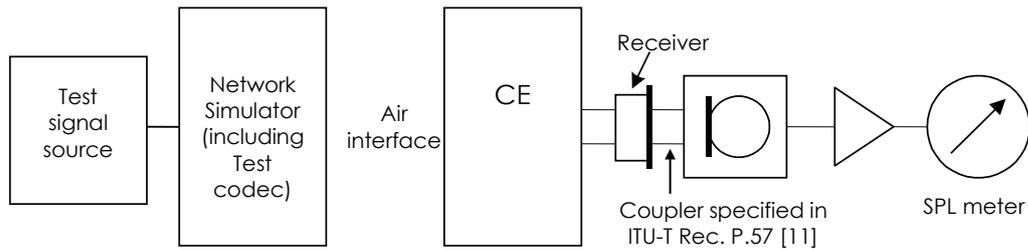


Figure 1

Test circuit for Sound Pressure Level tests

6.3.2 Volume control

If a volume control can be used with the equipment under test, the volume control should be set to maximum for the tests.

6.3.3 Step test parameters

Measurements over the frequency range and subsequent signal level range should be performed as a series of step tests. The recommended step test parameters as specified in Appendix A are—

- (a) Frequency steps to be in one-third octave intervals over the frequency range from 400 Hz to 900 Hz and in one-sixth octave intervals over the frequency range from 900 Hz to 4 kHz
- (b) Tone duration: 500 ms
- (c) Tone off time between steps: 3 seconds
- (d) Level step size: 2 dB
- (e) Number of levels: 7

6.3.4 Maximum digital code

The test signals should be applied so that the peaks of the highest level test signals produce the maximum digital code in the network simulator.

APPENDIX

A STEPPED PULSED STIMULI FOR TIME DEPENDENT LIMITING TEST

A1 Introduction

This Appendix defines the test parameters required to meet the requirements of the pulsed tone measurement method specified in Clause 6.3.3.

A series of tone pulses is provided at specific frequencies beginning at a relative low level and increasing over a number of steps up to the maximum level required for the product.

This sequence is repeated at each of seventeen specified test frequencies over the voice band.

Note: Note: A separate compact disc (CD) has been produced to assist in providing the stepped pulse stimuli in order to ensure repeatable test procedures. The CD is available for purchase as a standalone item (as AS/ACIF S004 Supplement 1:2004) and it is provided free of additional charge with printed hardcopies of AS/ACIF S004 [3]. The CD and/or a printed hardcopy of AS/ACIF S004 [3] may be obtained from SAI Global, GPO Box 5420, Sydney NSW 2001 or via <http://www.saiglobal.com>

The CD contains three test sequences. The test sequence to use for this Standard is the one to suit the requirements of a digital product e.g. a mobile telephone. (Tracks 21 to 40 on the CD correspond to this test sequence.) A series of tone pulses is provided at specific frequencies beginning at a relative low level and increasing over a number of steps up to the maximum level required for the product.

The CD is recorded as a two channel recording. The test sequence is recorded on channel 1. The voice announcements are on channel 2 to advise and prompt the test officer as to which test is being run.

When performing the test, channel 1 is to be connected to a power amplifier capable of generating the required output level as a test signal source (refer to Figure 1) while channel 2 is to be connected to a monitor amplifier and speaker (or headphone) at a suitable listening level.

A sixty second alignment tone is provided at the beginning of the test sequence to set up the amplifier gain to the correct level. This is followed by ten seconds of silence before the test sequence continues beginning at the minimum level.

A2 Test frequency list

The frequency list in Table A1 is considered to adequately test a product over the voice band, particularly covering the frequencies where an acoustic shock is most likely to be induced, i.e. greater than 1 kHz.

Table A1
Test frequency list

Test group	Frequency (Hz)	Test group	Frequency (Hz)
1	410	10	1728
2	516	11	1939
3	649	12	2175
4	818	13	2441
5	972	14	2738
6	1090	15	3073
7	1223	16	3447
8	1372	17	3868
9	1540		

A3 Telephone product tracks

The test sequence for digital products is listed in Table A3, with the alignment tone for the test sequence specified in Table A2 below.

The maximum SPL (A weighted) during each of the sequences is to be recorded.

Table A2
Alignment tones

Products track	Frequency (Hz)	Duration (s)	Voice prompt	Action
Digital	1040	60	'Alignment tone'	Adjust for +3.0 dBm0 at test codec

Note: The 'Products track' and 'Voice prompt' columns in Table A2 apply to the separate CD referred to in the Note to Appendix A1 (i.e. AS/ACIF S004 Supplement 1:2013).

Table A3
Digital products track test

Test Group 1		
Level	Duration (s)	Voice announcement
0 V	10	'410 Hz -9 dBm0'
-9 dB	0.5	
0 V	3	'410 Hz -7 dBm0'
-7 dB	0.5	
0 V	3	'410 Hz -5 dBm0'
-5 dB	0.5	
0 V	3	'410 Hz -3 dBm0'
-3 dB	0.5	
0 V	3	'410 Hz -1 dBm0'
-1 dB	0.5	
0 V	3	'410 Hz +1 dBm0'
+1 dB	0.5	
0 V	3	'410 Hz +3 dBm0'
+3 dB	0.5	
0 V	3	'410 Hz +10 dBm0'
+10 dB	0.5	

Test Groups 2 to16				
Group	Level	Duration (s)	Voice announcement	
2, 3 4, 5 6, 7 8, 9 10, 11 12, 13 14, 15 16	0 V	3	'516 Hz -9 dBm0'	
	-9 dB	0.5		
	This sequence repeated for			
		516 Hz,	649 Hz	
		818 Hz,	972 Hz	
		1090 Hz,	1223 Hz	
		1372 Hz,	1540 Hz	
		1728 Hz,	1939 Hz	
		2175 Hz,	2441 Hz	
		2738 Hz,	3073 Hz	
		3447 Hz		
		0 V	3	'3447 Hz +10 dBm0'
		+10 dB	0.5	

Test Group 17		
Level	Duration (s)	Voice announcement
0 V	3	'3868 Hz -9 dBm0'
-9 dB	0.5	
0 V	3	'3868 Hz -7 dBm0'
-7 dB	0.5	
0 V	3	'3868 Hz -5 dBm0'
-5 dB	0.5	
0 V	3	'3868 Hz -3 dBm0'
-3 dB	0.5	
0 V	3	'3868 Hz -1 dBm0'
-1 dB	0.5	
0 V	3	'3868 Hz +1 dBm0'
+1 dB	0.5	
0 V	3	'3868 Hz +3 dBm0'
+3 dB	0.5	
0 V	3	'3868 Hz +10 dBm0'
+10 dB	0.5	

Note: The +10 dBm0 signal is provided to ensure that the codec is overloaded and will clip the signal so that it is close to a square wave which will provide more energy than a sine wave.

APPENDIX

B ETSI STANDARD REFERENCE (INFORMATIVE)

B1 Introduction

The following table provides the ETSI Technical Standard clause references to each of the Emergency Service Number requirements in this Standard. These references have been provided to assist the reader in identifying the source and its relationship to each of the requirements in this Standard.

Table B4
ETSI Technical Standard clause references

AS/CA S042.1 requirement		ETSI Standard requirement
5.2.2.1		Emergency service number
5.2.2.1 (a)	Firmware	The storage of '000' as the Emergency Service Number in the CE is specified as a ' shall ' requirement in clause 10.1.1 of ETSI TS 122 101 [17].
		Identification of '000' as the Emergency Service Number in the case of the identity module not being present is specified as a ' shall ' requirement in clause 10.1.1 of ETSI TS 122 101 [17].
5.2.2.1 (b)	Mobile Identity	The use of the IMEI as a mobile identity during the initiation of an Emergency Call in the case of the identity module not being present is specified as a ' shall ' requirement in ETSI TS 124 008 [19] (for GSM and UTRA) and clause 5.5.1.2.2 of ETSI TS 124 301 [22] (for E-UTRA).
		The use of the IMEI as a mobile identity during the initiation of an Emergency Call in the case of the identity module being blocked and/or invalidated is specified as a ' shall ' requirement in clause 4.5.1.1 of ETSI TS 124 008 [19] (for GSM and UTRA) and clause 5.5.1.2.2 of ETSI TS 124 301 [22] (for E-UTRA).
		The use of the IMEI as a mobile identity during the initiation of an Emergency Call in the case of IMS Emergency session set up without emergency registration is specified as a ' shall ' requirement in clause 5.1.6.8.2 of ETSI TS 124 229 [21].

AS/CA S042.1 requirement		ETSI Standard requirement
		The use of IMSI/TMSI/GUTI as a mobile identity during the initiation of an Emergency Call in the case of the identity module being present is specified as a 'shall' requirement in clause 4.5.1.1 of ETSI TS 124 008 [19] (for GSM and UTRA). The use of IMSI/GUTI as a mobile identity during the initiation of an Emergency Call in the case of the identity module being present is specified as a 'shall' requirement in clause 5.5.1.2.2 of ETSI TS 124 301 [22] (for E-UTRA). The use of IMSI as a mobile identity during the initiation of an Emergency Call in the case of the identity module being present (IMS Emergency session set up within an emergency or non-emergency registration) is specified as a 'shall' requirement in clauses 5.1.6.8.3 and 5.1.6.8.4 of ETSI TS 124 229 [21].
5.2.2.1(c)	ECC field	The requirement to read the ECC field on the identity module and apply '000' or '112' (if stored in the ECC field) as an Emergency Service Number is specified as a 'shall' requirement in clause 10.1.1 of ETSI TS 122 101 [17] and clause 7.3.1.1 of ETSI TS 131 111 [23].
5.2.2.1(d)	Numeric keys	User input mechanisms to initiate Emergency Call is outside the scope of the 3GPP/ETSI Standards.
5.2.2.1(e)	Emergency call safeguard	User input mechanisms to initiate Emergency Call is outside the scope of the 3GPP/ETSI Standards.
5.2.2.1(f)	Locks	The initiation of an Emergency Call is specified as a 'shall' requirement in clause 10.1 of ETSI TS 122 101 [17], independent of the CE state.
5.2.2.2	Special flags and special signalling	
5.2.2.2.1	Emergency service numbers 000 and 112	The identification of '000' as an Emergency Service Number in the case of the identity module not being present or stored as an Emergency Service Number in the ECC field is specified as a 'shall' requirement in clause 10.1.1 of ETSI TS 122 101 [17]. In the above case, calls to '000' must be initiated as an emergency call, specified as a 'shall' requirement in clause 4.5.1.1 of ETSI TS 124 008 [19] (for GSM and UTRA) and clause 5.5.1.1 of ETSI TS 124 301 [22] (for E-UTRA).

PARTICIPANTS

The Working Committee responsible for the revisions made to this Standard consisted of the following organisations:

Organisation	Membership
ACMA	Non-Voting
Apple	Voting
Comtest Laboratories	Voting
EMC Technologies	Voting
HMD Global	Voting
Samsung	Voting
Singtel Optus	Voting
Telstra	Voting
TPG Telecom	Voting

This Working Committee was chaired by Steve Vodicka of Telstra. James Duck of Communications Alliance Ltd provided project management support.

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Published by:
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ISBN: 1 74000 462 0