

**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 52: Specific conditions for Cellular Communication
User Equipment (UE) radio and ancillary equipment;
Harmonised Standard for ElectroMagnetic Compatibility
(ETSI EN 301 489-52 V1.2.1 (2021-11))**

Medieninhaber und Hersteller:

OVE Österreichischer Verband für Elektrotechnik
Austrian Standards Institute

Copyright © OVE/Austrian Standards Institute – 2022.

Alle Rechte vorbehalten! Nachdruck oder Vervielfältigung,
Aufnahme auf oder in sonstige Medien oder Datenträger nur
mit Zustimmung gestattet!

**Verkauf von in- und ausländischen Normen und
technischen Regelwerken durch**

Austrian Standards Institute
Heinestraße 38, 1020 Wien
E-Mail: sales@austrian-standards.at
Internet: www.austrian-standards.at
Webshop: www.austrian-standards.at/webshop
Tel.: +43 1 213 00-300
Fax: +43 1 213 00-818

Alle Regelwerke für die Elektrotechnik auch erhältlich bei
OVE Österreichischer Verband für Elektrotechnik
Eschenbachgasse 9, 1010 Wien
E-Mail: verkauf@ove.at
Internet: www.ove.at
Webshop: www.ove.at/shop
Tel.: +43 1 587 63 73

ICS 33.100.10

Ident (IDT) mit ETSI EN 301 489-52 V1.2.1 (2021-11)

zuständig OVE/Komitee
TK IT-EG
Informationstechnologie, Telekommunikation und
Elektronik

Nationales Vorwort

Diese Europäische Norm EN 301 489-52 V1.2.1:2021 hat sowohl den Status einer nationalen elektrotechnischen Norm gemäß ETG 1992 als auch den einer nationalen Norm gemäß NormG 2016. Bei ihrer Anwendung ist dieses Nationale Vorwort zu berücksichtigen.

Für den Fall einer undatierten normativen Verweisung (Verweisung auf einen Standard ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils neueste Ausgabe dieses Standards.

Für den Fall einer datierten normativen Verweisung bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe des Standards.

Der Rechtsstatus dieser nationalen (elektrotechnischen) Norm ist den jeweils geltenden Verordnungen zum Elektrotechnikgesetz zu entnehmen.

Bei mittels Verordnungen zum Elektrotechnikgesetz verbindlich erklärten nationalen (elektrotechnischen) Normen ist zu beachten:

- Hinweise auf Veröffentlichungen beziehen sich, sofern nicht anders angegeben, auf den Stand zum Zeitpunkt der Herausgabe dieser nationalen (elektrotechnischen) Norm. Zum Zeitpunkt der Anwendung dieser nationalen (elektrotechnischen) Norm ist der durch die Verordnungen zum Elektrotechnikgesetz oder gegebenenfalls auf andere Weise festgelegte aktuelle Stand zu berücksichtigen.
- Informative Anhänge und Fußnoten sowie normative Verweise und Hinweise auf Fundstellen in anderen, nicht verbindlichen Texten werden von der Verbindlicherklärung nicht erfasst.

Europäische Normen (EN) von ETSI werden gemäß den „Gemeinsamen Regeln“ von CEN/CENELEC durch Veröffentlichung eines identen Titels und Textes in das Gesamtwerk der nationalen (elektrotechnischen) Normen übernommen, wobei der Nummerierung der Zusatz ÖVE/ÖNORM vorangestellt wird.

Der von ETSI übermittelte Normentext wird in englischer Sprache veröffentlicht, da davon ausgegangen werden kann, dass die Anwender der Norm über ausreichende englische Sprachkenntnisse verfügen.

ETSI EN 301 489-52 V1.2.1 (2021-11)



**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 52: Specific conditions for Cellular Communication
User Equipment (UE) radio and ancillary equipment;
Harmonised Standard for ElectroMagnetic Compatibility**

Reference

DEN/ERM-EMC-354

Keywords

EMC, GSM, harmonised standard, LTE, MSR, NR,
OFDMA, WCDMA, WMAN**ETSI**650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2021.

All rights reserved.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	6
1 Scope	7
2 References	7
2.1 Normative references	7
2.2 Informative references.....	9
3 Definition of terms, symbols and abbreviations.....	10
3.1 Terms.....	10
3.2 Symbols.....	12
3.3 Abbreviations	12
4 Test conditions	13
4.1 General	13
4.2 Arrangements for test signals	13
4.2.0 General.....	13
4.2.1 Reference Sensitivity Level	13
4.2.2 Arrangements for test signals for GSM	13
4.2.3 Arrangements for test signals for UTRA and E-UTRA.....	13
4.2.4 Arrangements for test signals for NR	14
4.2.4.1 General for NR.....	14
4.2.4.2 NR FR1 SA	14
4.2.4.3 NR FR1 NSA	14
4.2.5 Arrangements for test signals at the output of transmitters.....	15
4.2.6 Arrangements for test signals at the input of receivers	15
4.2.6.1 General	15
4.2.6.2 Arrangements for test signals at the input of GSM receivers.....	15
4.2.6.3 Arrangements for test signals at the input of UTRA and E-UTRA receivers	15
4.2.6.4 Arrangements for test signals at the input of E-UTRA with LAA.....	16
4.2.6.5 Arrangements for test signals at the input of E-UTRA with in band or guard band NB-IoT, Standalone NB-IoT	16
4.2.6.6 Arrangements for test signals at the input of NR receivers.....	16
4.3 Exclusion bands.....	16
4.3.1 GSM Transmitter exclusion band.....	16
4.3.2 GSM Receiver exclusion band.....	16
4.3.3 UTRA and E-UTRA Transmitter exclusion band.....	16
4.3.3.1 UTRA.....	16
4.3.3.2 E-UTRA.....	16
4.3.4 UTRA and E-UTRA Receiver exclusion band	17
4.3.5 NR SA and NSA Transmitter exclusion band.....	17
4.3.6 NR SA and NSA Receiver exclusion band.....	17
4.4 Narrow band responses of receivers and receivers of duplex transceivers.....	17
4.4.1 GSM Narrow band responses on receivers.....	17
4.4.2 UTRA and E-UTRA Narrow band responses on receivers.....	18
4.4.2.1 UTRA.....	18
4.4.2.2 E-UTRA	18
4.4.3 NR Narrow band responses on receivers	19
5 Ancillary equipment.....	19
6 Performance criteria	19
6.1 Performance criteria for Continuous phenomena	19
6.1.1 GSM and voice call.....	19
6.1.1.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)	19
6.1.1.2 Performance criteria for Continuous phenomena applied to Receivers (CR)	19
6.1.2 UTRA	20

6.1.3	E-UTRA, E-UTRA with LAA, inband or guard band NB-IoT, Standalone NB-IoT	20
6.1.4	NR.....	20
6.2	Performance criteria for Transient phenomena	20
7	Requirements.....	20
7.1	General	20
7.2	Emission.....	21
7.2.1	General.....	21
7.2.2	Special conditions.....	21
7.3	Immunity	21
7.3.1	General.....	21
7.3.2	Special conditions.....	22
Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	23
Annex B (normative):	Performance assessment voice call, Audio breakthrough.....	25
B.1	Calibration of audio levels	25
B.2	Measurement of audio levels.....	26
Annex C (normative):	Performance assessment of data transfer call, Error Ratios	27
C.1	Calibration of data transfer.....	27
C.1.1	UTRA	27
C.1.2	E-UTRA and NR.....	27
C.2	Assessment of data transfer.....	27
C.2.1	UTRA, Derivation of Error Ratios	27
C.2.2	E-UTRA and NR, Derivation of Throughput Percentages	28
C.3	EUT without data application ancillary.....	28
C.4	EUT with data application ancillary.....	28
Annex D (informative):	Change history	30
History		31

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

The present document is part 52 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

National transposition dates	
Date of adoption of this EN:	19 November 2021
Date of latest announcement of this EN (doa):	28 February 2022
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2022
Date of withdrawal of any conflicting National Standard (dow):	31 August 2023

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Copyright ÖVE

1 Scope

The present document specifies the applicable test conditions, performance assessment, and performance criteria for Cellular Communication User Equipment (UE), including Customer Premise Equipment (CPE), Set Top Box (STB) containing cellular communication technologies, and the associated ancillary equipment in respect of ElectroMagnetic Compatibility (EMC) for equipment utilizing the technologies in table 1.

Table 1: Technologies User Equipment (UE) radio and ancillary equipment Cellular Communication

Cellular Mobile Communication Technology	Technology Generation	Standard Set	ETSI Standard
Global System for Mobile communications (GSM)	2G/3G	IMT-2000 SC single carrier	ETSI EN 301 511 [i.9]
CDMA Multi-Carrier (cdma2000)	2G/3G	IS-95/CDMA2000 - IMT-MC multi carrier	ETSI EN 301 908-4 [i.10]
CDMA Direct Spread (UTRA FDD)	3G	IMT-2000 Direct Spread	ETSI EN 301 908-2 [i.11]
Evolved Universal Terrestrial Radio Access (E-UTRA)	4G	IMT-advanced	ETSI EN 301 908-13 [i.12]
New Radio (NR)	5G	IMT-2020	ETSI TS 138 521-1 [15], ETSI TS 138 521-3 [16]

Technical specifications related to the antenna port of radio equipment and radiated emissions from the enclosure port of radio equipment and combinations of radio and associated ancillary equipment are not included in the present document. Such technical specifications are normally found in the relevant product standards for the effective use of the radio spectrum.

NOTE 1: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.2] is given in annex A.

NOTE 2: The present document does not cover the radio base stations as specified in ETSI EN 301 489-50 [i.13].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 301 489-1 (V2.2.3) (11-2019): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility".
- [2] ETSI TS 134 108 (V15.2.0) (10-2019): "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108 version 15.2.0 Release 15)".
- [3] ETSI TS 125 101 (V16.1.0) (11-2020): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101 version 16.1.0 Release 16)".