

ETSI EN 301 511 V12.1.1 (2015-06)



**Global System for Mobile communications (GSM);
Harmonised EN for mobile stations
in the GSM 900 and GSM 1800 bands
covering essential requirements under
article 3.2 of the R&TTE directive (1999/5/EC)**

<https://standards.iteh.ai/catalog/standards/sist/4d77-8f01-8f11-9888b0c1c0c1/etsi-en-301-511-v12-1-1-2015-06>

Reference

REN/MSG-0018

Keywords

cellular, ER-GSM, GSM, mobile, R-GSM

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 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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 only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

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

<http://portal.etsi.org/tb/status/status.asp>

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>

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.

© European Telecommunications Standards Institute 2015.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
Introduction	6
1 Scope	8
2 References	8
2.1 Normative references	8
2.2 Informative references.....	10
3 Definitions and abbreviations.....	11
3.1 Definitions	11
3.2 Abbreviations	11
4 Technical requirements specifications	11
4.1 Environmental profile.....	11
4.2 Conformance requirements	12
4.2.0 References.....	12
4.2.1 Transmitter - Frequency error and phase error	12
4.2.2 Transmitter - Frequency error under multipath and interference conditions	12
4.2.3 Transmitter - Frequency error and phase error in HSCSD multislot configuration	12
4.2.4 Frequency error and phase error in GPRS multislot configuration	12
4.2.5 Transmitter output power and burst timing.....	12
4.2.6 Transmitter - Output RF spectrum.....	12
4.2.7 Transmitter output power and burst timing in HSCSD multislot configurations.....	12
4.2.8 Transmitter - Output RF spectrum in HSCSD multislot configuration.....	12
4.2.9 Transmitter - Output RF spectrum for MS supporting the R-GSM or ER-GSM frequency band	12
4.2.10 Transmitter output power in GPRS multislot configuration	12
4.2.11 Output RF spectrum in GPRS multislot configuration	12
4.2.12 Conducted spurious emissions - MS allocated a channel	13
4.2.13 Conducted spurious emissions - MS in idle mode	13
4.2.14 Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel.....	13
4.2.15 Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	13
4.2.16 Radiated spurious emissions - MS allocated a channel	13
4.2.17 Radiated spurious emissions - MS in idle mode	13
4.2.18 Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel.....	13
4.2.19 Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	13
4.2.20 Receiver Blocking and spurious response - speech channels	13
4.2.21 Receiver Blocking and spurious response - speech channels for MS supporting the R-GSM or ER-GSM frequency band.....	13
4.2.22 Frequency error and Modulation accuracy in EGPRS Configuration.....	13
4.2.23 Frequency error under multipath and interference conditions in EGPRS Configuration.....	13
4.2.24 EGPRS Transmitter output power	13
4.2.25 Output RF spectrum in EGPRS configuration.....	14
4.2.26 Blocking and spurious response in EGPRS configuration.....	14
4.2.27 Blocking and spurious response in DLMC configuration.....	14
5 Testing for compliance with technical requirements.....	14
5.1 Environmental conditions for testing	14
5.2 Interpretation of the measurement results	14
5.3 Essential radio test suites.....	14
5.3.1 Transmitter - Frequency error and phase error	14
5.3.2 Transmitter - Frequency error under multipath and interference conditions	14
5.3.3 Transmitter - Frequency error and phase error in HSCSD multislot configuration	14

5.3.4	Frequency error and phase error in GPRS multislot configuration.....	15
5.3.5	Transmitter output power and burst timing.....	15
5.3.6	Transmitter - Output RF spectrum.....	15
5.3.7	Transmitter output power and burst timing in HSCSD multislot configurations.....	15
5.3.8	Transmitter - Output RF spectrum in HSCSD multislot configuration.....	15
5.3.9	Transmitter - Output RF spectrum for MS supporting the R-GSM or ER-GSM frequency band	15
5.3.10	Transmitter output power in GPRS multislot configuration	15
5.3.11	Output RF spectrum in GPRS multislot configuration	15
5.3.12	Conducted spurious emissions - MS allocated a channel	15
5.3.13	Conducted spurious emissions - MS in idle mode	15
5.3.14	Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel.....	15
5.3.15	Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	15
5.3.16	Radiated spurious emissions - MS allocated a channel	15
5.3.17	Radiated spurious emissions - MS in idle mode	15
5.3.18	Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel.....	16
5.3.19	Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	16
5.3.20	Receiver Blocking and spurious response - speech channels	16
5.3.21	Receiver Blocking and spurious response - speech channels for MS supporting the R-GSM or ER-GSM frequency band.....	16
5.3.22	Frequency error and Modulation accuracy in EGPRS Configuration.....	16
5.3.23	Frequency error under multipath and interference conditions in EGPRS Configuration.....	16
5.3.24	EGPRS Transmitter output power	16
5.3.25	Output RF spectrum in EGPRS configuration	16
5.3.26	Blocking and spurious response in EGPRS configuration.....	16
5.3.27	Blocking and spurious response in DLTC configuration.....	16
Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT).....		17
A.1	Test specification table.....	17
A.2	Type of Mobile Stations	20
A.3	Additional Information.....	21
Annex B (informative): Change history		22
History		23

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is 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 (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, 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.

Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

The update to version 12.1.1 of the present document includes the following major changes:

- Inclusion of mobile equipment supporting operation in the ER-GSM 900 band.
- Inclusion of mobile equipment supporting operation in Downlink Multi-Carrier mode (DLMC).

The present document has been produced by ETSI in response to mandate M/284 issued from the European Commission under Council Directive 98/34/EC [i.4] as amended by Directive 98/48/EC [i.8].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonised Standard under Directive 1999/5/EC [i.6].

The requirements relevant to Directive 1999/5/EC [i.6] are summarized in Annex A.

National transposition dates

Date of adoption of this EN:	10 June 2015
Date of latest announcement of this EN (doa):	30 September 2015
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2016
Date of withdrawal of any conflicting National Standard (dow):	31 March 2017

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.

Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [i.6]. Each standard is a module in the structure. The modular structure is shown in figure 1.

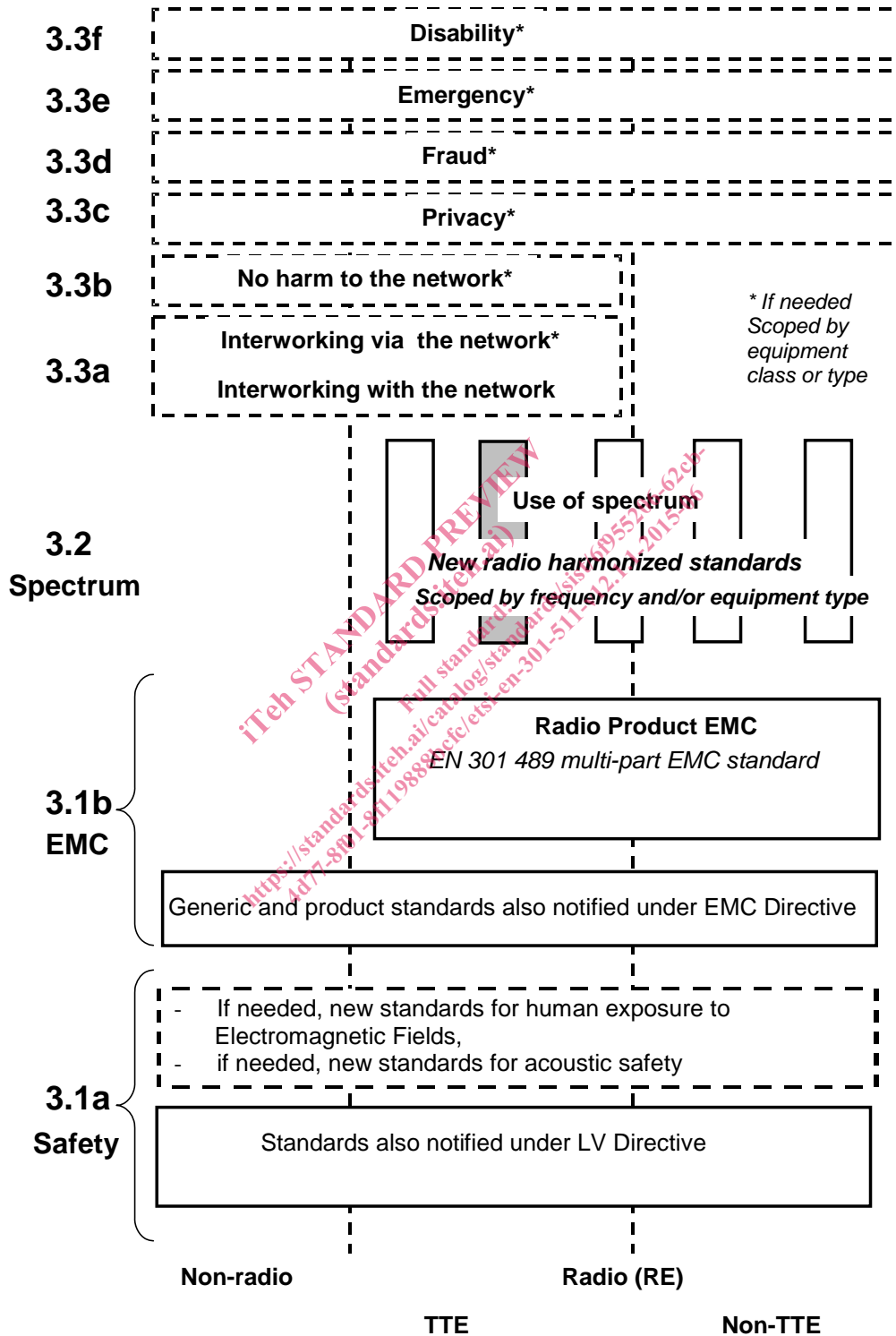


Figure 1: Modular structure for the various standards used under the R&TTE Directive [i.6]

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [i.6].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows ETSI EN 301 489 [i.3], the multi-part product EMC standard for radio used under the EMC Directive [i.1].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [i.2] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [i.6] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [i.6] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
 - under article 3.2 when new frequency bands are agreed; or
 - under article 3.3 should the Commission take the necessary decisions without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonised Standards as the relevant means of conformity assessment.

1 Scope

The present document applies to the following radio telecommunications terminal equipment types:

- GSM mobile station.

This radio equipment type is for operation within the Digital cellular telecommunications system in the GSM 900 and/or GSM 1800 frequency bands as shown in table 1, with a channel separation of 200 kHz, utilizing constant envelope modulation and carrying traffic channels according to the Time Division Multiple Access (TDMA) principle.

Table 1: Frequency bands for GSM 900 and GSM 1800 Mobile Station system

Type	TX	RX
P-GSM 900	890 MHz to 915 MHz	935 MHz to 960 MHz
GSM 1800	1 710 MHz to 1 785 MHz	1 805 MHz to 1 880 MHz
E-GSM 900	880 MHz to 915 MHz	925 MHz to 960 MHz
R-GSM 900	876 MHz to 915 MHz	921 MHz to 960 MHz
ER-GSM 900	873 MHz to 915 MHz	918 MHz to 960 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [i.6] article 3.2, which states that "..... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

The present document covers the general access requirements for terminal equipment up to and including 3GPP Rel-12. The general access requirements, applied to the terminal equipment, are for one release only. The present document does not cover the GPRS Class A mobiles and the ECSD mobiles.

For each test purpose and its corresponding conformance requirement, a reference is given to the test method in ETSI TS 151 010-1 [2]. The requirements apply at the air interface, which may be stimulated to perform the tests by additional equipment if necessary.

The measurement uncertainty is described in ETSI TS 151 010-1 [2], Annex 5.

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive [i.6] will apply to equipment within the scope of the present document.

NOTE 1: A list of such ENs is included on the web site <http://www.newapproach.org>.

ETSI TS 151 010-1 [2] constitutes the conformance test suite for GSM. The verification of the conformance requirements in the present document is based on the tests described in this reference. The set of requirements in ETSI TS 151 010-1 [2] and the set of requirements in the present document need not be identical.

Some requirements only apply to specific types of mobile station (e.g. data tests only apply to mobile stations with a data facility, tests that only apply to GSM 900 or only to GSM 1800 or to both). The present document indicates the specific test which should be carried out for each mobile station type.

An active accessory is covered by the present document if it modifies the terminal performance in an aspect which affects conformance to essential requirements.

NOTE 2: Only active devices are subject to the present document. Accessories may be tested with specific terminals, and either approved for use with those terminals only, or may possibly be approved for use with a wider range of terminals, depending on the nature and effect of the accessory.

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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://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] Void.
- [2] ETSI TS 151 010-1 (V12.2.0) (11-2014): "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 12.2.0 Release 12)".
- [3] Void.
- [4] Void.
- [5] ETSI ETS 300 905 (V5.3.2) (01-1998): "Digital cellular telecommunications system (Phase 2+) (GSM); Teleservices supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.03 version 5.3.2)".
- [6] ETSI TS 100 905 (V6.0.0) (01-1999): "Digital cellular telecommunications system (Phase 2+) (GSM); Teleservices supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.03 version 6.0.0 Release 1997)".
- [7] ETSI TS 100 905 (V7.0.0) (08-1999): "Digital cellular telecommunications system (Phase 2+) (GSM); Teleservices supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.03 version 7.0.0 Release 1998)".
- [8] ETSI TS 122 003 (V3.3.0) (07-2001): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Circuit Teleservices supported by a Public Land Mobile Network (PLMN) (3GPP TS 22.003 version 3.3.0 Release 1999)".
- [9] ETSI TS 122 003 (V4.3.0) (03-2002): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Circuit Teleservices supported by a Public Land Mobile Network (PLMN) (3GPP TS 22.003 version 4.3.0 Release 4)".
- [10] Void.
- [11] Void.
- [12] ETSI TS 122 060 (V3.5.0) (10-2000): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 1 (3GPP TS 22.060 version 3.5.0 Release 1999)".
- [13] ETSI TS 122 060 (V4.4.0) (06-2002): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 1 (3GPP TS 22.060 version 4.4.0 Release 4)".
- [14] Void.
- [15] Void.
- [16] ETSI TS 101 349 (V8.16.0) (09-2002): "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/ Medium Access Control (RLC/MAC) protocol (3GPP TS 04.60 version 8.16.0 Release 1999)".
- [17] ETSI TS 144 060 (V12.3.0) (01-2015): "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control / Medium Access Control (RLC/MAC) protocol (3GPP TS 44.060 version 12.3.0 Release 12)".
- [18] Void.

- [19] ETSI TS 100 908 (V5.10.0) (10-2001): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path (3GPP TS 05.02 version 5.10.0 Release 1996)".
- [20] ETSI TS 100 908 (V6.10.0) (10-2001): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path (3GPP TS 05.02 version 6.10.0 Release 1997)".
- [21] ETSI TS 100 908 (V7.7.0) (10-2001): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path (3GPP TS 05.02 version 7.7.0 Release 1998)".
- [22] ETSI TS 100 908 (V8.10.0) (10-2001): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path (3GPP TS 05.02 version 8.10.0 Release 1999)".
- [23] ETSI TS 145 002 (V4.5.0) (11-2001): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path (3GPP TS 45.002 version 4.5.0 Release 4)".
- [24] Void.
- [25] ETSI TS 100 910 (V5.13.0) (09-2000): "Digital cellular telecommunications system (Phase 2+) (GSM); Radio transmission and reception (3GPP TS 05.05 version 5.13.0 Release 1996)".
- [26] ETSI TS 100 910 (V6.8.0) (08-2002): "Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception (3GPP TS 05.05 version 6.8.0 Release 1997)".
- [27] ETSI TS 100 910 (V7.9.0) (09-2002): "Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception (3GPP TS 05.05 version 7.9.0 Release 1998)".
- [28] ETSI TS 100 910 (V8.14.0) (09-2002): "Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception (3GPP TS 05.05 version 8.14.0 Release 1999)".
- [29] ETSI TS 145 005 (V12.4.0) (01-2015): "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception (3GPP TS 45.005 version 12.4.0 Release 12)".
- [30] ETSI TR 121 905 (V12.0.0) (10-2014): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Vocabulary for 3GPP Specifications (3GPP TR 21.905 version 12.0.0 Release 12)".

2.2 Informative 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 reference document (including any amendments) applies.

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 not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- [i.2] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- [i.3] ETSI EN 301 489 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- [i.4] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.
- [i.5] Void.
- [i.6] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).