

ETSI EN 301 166-2 V1.2.2 (2008-08)

Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Land Mobile Service;
Radio equipment for analogue and/or digital
communication (speech and/or data) and operating on
narrow band channels and having an antenna connector;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/349da3ad-91ab-4e84-a0e7-b0f0585211e0/etsi-en-301-166-2-v1.2.2-2008-08>



Reference

REN/ERM-TGDMR-271-2

Keywords

analogue, antenna, connector, data, digital,
mobile, PMR, radio, regulation, speech**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

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the 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:

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2008.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™**, **TIPHON™**, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	5
1 Scope	6
2 References	7
2.1 Normative references	7
2.2 Informative references.....	7
3 Definitions, symbols and abbreviations	8
3.1 Definitions.....	8
3.2 Symbols.....	8
3.3 Abbreviations	8
4 Technical requirements	8
4.1 Environmental profile.....	8
4.2 Transmitter requirements	8
4.2.1 Frequency error.....	8
4.2.1.1 Definition	8
4.2.1.2 Limit.....	8
4.2.1.3 Conformance.....	8
4.2.2 Maximum power (PX) (conducted).....	9
4.2.2.1 Definition	9
4.2.2.2 Limit.....	9
4.2.2.3 Conformance.....	9
4.2.3 Maximum effective radiated power	9
4.2.3.1 Definition	9
4.2.3.2 Limit.....	9
4.2.3.3 Conformance.....	9
4.2.4 Adjacent and alternate channel power.....	9
4.2.4.1 Definition	9
4.2.4.2 Limit.....	9
4.2.4.3 Conformance.....	9
4.2.5 Unwanted emissions in the spurious domain.....	9
4.2.5.1 Definition	9
4.2.5.2 Limit.....	9
4.2.5.3 Conformance.....	9
4.2.6 Intermodulation attenuation.....	10
4.2.6.1 Definition	10
4.2.6.2 Limit.....	10
4.2.6.3 Conformance.....	10
4.2.7 Transient power	10
4.2.7.1 Definition	10
4.2.7.2 Limit.....	10
4.2.7.3 Conformance.....	10
4.2.8 Transmitter timeout timer	10
4.2.8.1 Definition	10
4.2.8.2 Limit.....	10
4.2.8.3 Conformance.....	10
4.3 Receiver requirements.....	11
4.3.1 Maximum usable sensitivity.....	11
4.3.1.1 Definition	11
4.3.1.2 Limit.....	11
4.3.1.3 Conformance.....	11
4.3.2 Co-channel rejection	11
4.3.2.1 Definition	11

4.3.2.2	Limit.....	11
4.3.2.3	Conformance.....	11
4.3.3	Adjacent channel selectivity.....	11
4.3.3.1	Definition.....	11
4.3.3.2	Limit.....	11
4.3.3.3	Conformance.....	11
4.3.4	Spurious response rejection.....	12
4.3.4.1	Definition.....	12
4.3.4.2	Limit.....	12
4.3.4.3	Conformance.....	12
4.3.5	Intermodulation response rejection.....	12
4.3.5.1	Definition.....	12
4.3.5.2	Limit.....	12
4.3.5.3	Conformance.....	12
4.3.6	Blocking or desensitization.....	12
4.3.6.1	Definition.....	12
4.3.6.2	Limit.....	12
4.3.6.3	Conformance.....	12
4.3.7	Spurious radiations.....	12
4.3.7.1	Definition.....	12
4.3.7.2	Limit.....	13
4.3.7.3	Conformance.....	13
5	Testing for compliance with technical requirements.....	13
5.1	Environmental conditions for testing.....	13
5.1.1	Normal and extreme test-conditions.....	13
5.1.2	Test power source.....	13
5.1.3	Choice of samples for the measurements.....	13
5.2	Interpretation of the measurement results.....	13
5.3	Essential test suites.....	14
5.3.1	Frequency error.....	14
5.3.2	Maximum power (PX) (conducted).....	14
5.3.3	Maximum effective radiated power.....	14
5.3.4	Adjacent and alternate channel power.....	14
5.3.5	Unwanted emissions in the spurious domain.....	14
5.3.6	Intermodulation attenuation.....	14
5.3.7	Transient power.....	14
5.3.8	Receiver spurious radiations.....	14
5.4	Other test suites.....	14
5.4.1	Maximum usable sensitivity.....	14
5.4.2	Co-channel rejection.....	14
5.4.3	Adjacent channel selectivity.....	15
5.4.4	Spurious response rejection.....	15
5.4.5	Intermodulation response rejection.....	15
5.4.6	Blocking or desensitization.....	15
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	16
Annex B (informative):	The EN title in the official languages.....	18
History.....		19

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://webapp.etsi.org/IPR/home.asp>).

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 Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [3] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] 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 ("the R&TTE Directive" [1]).

The present document is part 2 of a multi-part deliverable covering Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating on narrow band channels and having an antenna connector, as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

National transposition dates

Date of adoption of this EN:	15 August 2008
Date of latest announcement of this EN (doa):	30 November 2008
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2009
Date of withdrawal of any conflicting National Standard (dow):	31 May 2010

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [1]. The modular structure is shown in EG 201 399 [i.2].

1 Scope

The present document applies to radio transmitters and receivers used in stations in the Private Mobile Radio (PMR) service. It applies to use in the land mobile service capable of operating in all or any part of the frequency bands given below.

Table 1: Radiocommunications service frequency bands

Radiocommunications service frequency bands	
Transmit	30 MHz to 3 000 MHz
Receive	30 MHz to 3 000 MHz

The present document applies to equipment operating with narrow channel separations (CSP) (less than 10 kHz) and intended for speech and/or data. It is the intention of the present document to cover any Channel BandWidths (CBW) permitted by National Administrations for such systems e.g. 6,25 kHz.

In the present document different requirements are given for the different radio frequency bands, environmental conditions and types of equipment where appropriate.

In the present document, data transmission systems are defined as systems which transmit and/or receive data and/or digitized voice. The equipment comprises a transmitter and associated encoder and modulator and/or a receiver and associated demodulator and decoder.

The present document covers equipment which may use constant envelope or non-constant envelope modulation.

The types of equipment covered by the present document are as follows:

- base station: equipment fitted with antenna connector;
- mobile station: equipment fitted with antenna connector;
- handportable stations:
 - a) either fitted with an antenna connector; or
 - b) without an external antenna connector but fitted with a permanent internal or a temporary internal 50 Ω RF connector which allows access to the transmitter output and the receiver input.

Handportable station equipment without an external or internal Radio Frequency (RF) connector and without the possibility of having a temporary internal 50 Ω RF connector is not covered by the present document.

The present document is intended to cover the provisions of article 3.2 of Directive 1999/5/EC [1] (R&TTE Directive), 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".

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 [1] may apply to equipment within the scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

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

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

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

2.1 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] 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).
- [2] ETSI EN 301 166-1 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating on narrow band channels and having an antenna connector Part 1: Technical characteristics and methods of measurement".
- [3] 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.

2.2 Informative references

The following referenced documents are not essential to the use of the ETSI deliverable but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] ETSI TR 100 028 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.2] ETSI EG 201 399 (V2.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1] and EN 301 166-1 [2] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 301 166-1 [2] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 301 166-1 [2] apply.

4 Technical requirements

For equipment without an external antenna connector (integral antenna equipment) but fitted with a permanent internal or a temporary internal 50 Ω RF connector which allows access to the transmitter output and the receiver input, the following additional measurements are made using the equipment antenna connected to the station (and not using any connector):

- transmitter effective radiated power;
- transmitter radiated spurious emissions;
- receiver maximum usable sensitivity (field strength);
- receiver spurious radiations.

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the manufacturer. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

4.2 Transmitter requirements

4.2.1 Frequency error

4.2.1.1 Definition

The frequency error is defined in EN 301 166-1 [2], clause 7.7.1.

4.2.1.2 Limit

The frequency error shall not exceed the limits in EN 301 166-1 [2], clause 7.7.3.

4.2.1.3 Conformance

If the transmitter adjacent and alternate channels power (clause 5.3.4) has not been measured under extreme test conditions, then the conformance tests as defined in clause 5.3.1 shall be carried out.

4.2.2 Maximum power (PX) (conducted)

4.2.2.1 Definition

The maximum power (conducted) is defined in EN 301 166-1 [2], clause 7.1.1.

4.2.2.2 Limit

The maximum power (conducted) shall not exceed the limits in EN 301 166-1 [2], clause 7.1.3.

4.2.2.3 Conformance

Conformance tests as defined in clause 5.3.2 shall be carried out.

4.2.3 Maximum effective radiated power

4.2.3.1 Definition

The maximum effective radiated power is defined in EN 301 166-1 [2], clause 7.2.1.

4.2.3.2 Limit

The maximum effective radiated power shall not exceed the limits in EN 301 166-1 [2], clause 7.2.3.

4.2.3.3 Conformance

Conformance tests as defined in clause 5.3.3 shall be carried out.

4.2.4 Adjacent and alternate channel power

4.2.4.1 Definition

The adjacent channel power is defined in EN 301 166-1 [2], clause 7.3.1.

4.2.4.2 Limit

The adjacent channel power shall not exceed the limits in EN 301 166-1 [2], clause 7.3.3.

4.2.4.3 Conformance

Conformance tests as defined in clause 5.3.4 shall be carried out.

4.2.5 Unwanted emissions in the spurious domain

4.2.5.1 Definition

The unwanted emissions in the spurious domain are defined in EN 301 166-1 [2], clause 7.4.1.

4.2.5.2 Limit

The unwanted emissions in the spurious domain shall not exceed the limits in EN 301 166-1 [2], clause 7.4.3.

4.2.5.3 Conformance

Conformance tests as defined in clause 5.3.5 shall be carried out.