

9`Y\_fca U[ bYfbUnXfi y`^j cgh]b`nUXYj Yj`nj Yn]`n`fUX]`g\_`ja `gdY\_fca `fØFAŁË  
Ghcf]h`j`\_cdYbg\_`^`a cV]b]`\_ca i b]\_UW]`É`FUX]`g\_`UcdfYa UnUdfYbcg`dcXUh\_cj  
ft:n]fca U[ cj cfUž\_]`i dcfUV`^`a cXi`^`UW]`c`g\_`cbghUblbc`U]`bY\_cbghUblbc`cj`c`b]Wc  
]b`]a UUbhYbg\_]`df]`^` Y\_`É`%`XY.`HY b] bY`\_UfU`hY]`gh\_]`b`a Yf]`bY`a YfcXY

Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service;  
Radio equipment intended for the transmission of data (and/or speech) using constant or  
non-constant envelope modulation and having an antenna connector; Part 1: Technical  
characteristics and methods of measurement

**(standards.iteh.ai)**

[SIST EN 300 113-1 V1.4.1:2003](https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003)

[https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-  
d30138b8b269/sist-en-300-113-1-v1-4-1-2003](https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003)

**Ta slovenski standard je istoveten z: EN 300 113-1 Version 1.4.1**

**ICS:**

33.060.99	Druga oprema za radijske komunikacije	Other equipment for radiocommunications
33.070.01	Mobilni servisi na splošno	Mobile services in general
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

**SIST EN 300 113-1 V1.4.1:2003**                      **en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 300 113-1 V1.4.1:2003

<https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003>

# ETSI EN 300 113-1 V1.4.1 (2002-02)

---

*European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Land mobile service;  
Radio equipment intended for the transmission  
of data (and/or speech) using constant or non-constant  
envelope modulation and having an antenna connector;  
Part 1: Technical characteristics and  
methods of measurement**

---

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

[SIST EN 300 113-1 V1.4.1:2003](https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003>



---

**Reference**

REN/ERM-RP02-054-1

---

**Keywords**

antenna, data, mobile, PMR, radio, 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

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN 300 113-1 V1.4.1:2003

<https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003>

---

**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, send your comment to:

[editor@etsi.fr](mailto:editor@etsi.fr)

---

**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 2002.  
All rights reserved.

# Contents

Intellectual Property Rights .....	8
Foreword.....	8
Introduction .....	8
1 Scope .....	10
2 References .....	11
3 Definitions, symbols and abbreviations .....	11
3.1 Definitions .....	11
3.2 Symbols.....	12
3.3 Abbreviations .....	13
4 General .....	13
4.1 Selection of equipment for testing purposes .....	14
4.2 Mechanical and electrical design.....	14
4.2.1 General.....	14
4.2.2 Controls .....	14
4.2.3 Transmitter shut-off facility .....	15
4.2.4 Marking .....	15
4.3 Interpretation of the measurement results .....	15
4.4 Testing using bit streams or messages.....	15
5 Technical characteristics .....	15
5.1 Transmitter parameter limits .....	15
5.1.1 Frequency error.....	15
5.1.2 Carrier power (conducted).....	16
5.1.3 Effective radiated power .....	16
5.1.4 Adjacent channel power .....	17
5.1.5 Spurious emissions .....	17
5.1.6 Intermodulation attenuation .....	18
5.1.7 Transmitter attack time .....	18
5.1.8 Transmitter release time.....	18
5.1.9 Transient behaviour of the transmitter.....	18
5.1.9.1 Time domain analysis of power and frequency.....	19
5.1.9.2 Adjacent channel transient power .....	19
5.1.9.2.1 Equipment measured as constant envelope angle modulation equipment .....	19
5.1.9.2.2 Equipment measured as non-constant envelope modulation equipment .....	19
5.2 Receiver parameter limits.....	20
5.2.1 Maximum usable sensitivity (data or messages, conducted) .....	20
5.2.2 Average usable sensitivity (data or messages, field strength).....	20
5.2.3 Error behaviour at high input levels.....	20
5.2.4 Co-channel rejection .....	21
5.2.5 Adjacent channel selectivity .....	21
5.2.6 Spurious response rejection .....	21
5.2.7 Intermodulation response rejection.....	21
5.2.8 Blocking or desensitization.....	21
5.2.9 Spurious radiations .....	21
5.3 Duplex operation - receiver limits.....	22
5.3.1 Receiver desensitization and maximum usable sensitivity (with simultaneous transmission and reception).....	22
5.3.2 Receiver spurious response rejection (with simultaneous transmission and reception).....	22
6 Test conditions, power sources and ambient temperatures .....	22
6.1 Normal and extreme test conditions .....	22
6.2 Test power source.....	22
6.3 Normal test conditions.....	23
6.3.1 Normal temperature and humidity .....	23

6.3.2	Normal test power source .....	23
6.3.2.1	Mains voltage .....	23
6.3.2.2	Regulated lead-acid battery power sources used on vehicles .....	23
6.3.2.3	Other power sources .....	23
6.4	Extreme test conditions .....	23
6.4.1	Extreme temperatures .....	23
6.4.2	Extreme test source voltages .....	24
6.4.2.1	Mains voltage .....	24
6.4.2.2	Regulated lead-acid battery power sources on vehicles .....	24
6.4.2.3	Power sources using other types of batteries .....	24
6.4.2.4	Other power sources .....	24
6.5	Procedure for tests at extreme temperatures .....	24
6.5.1	Procedure for equipment designed for continuous operation .....	25
6.5.2	Procedure for equipment designed for intermittent operation .....	25
7	General conditions .....	25
7.1	Arrangements for test signals applied to the receiver input .....	25
7.2	Receiver mute or squelch facility .....	25
7.3	Normal test signals (wanted and unwanted signals) .....	26
7.3.1	Equipment measured as constant envelope angle modulation equipment .....	26
7.3.2	Equipment measured as non constant envelope modulation equipment .....	27
7.4	Encoder for receiver measurements .....	27
7.5	Transceiver data interface .....	27
7.6	Impedance .....	28
7.7	Artificial antenna .....	28
7.8	Tests of equipment with a duplex filter .....	28
7.9	Facilities for access .....	28
7.9.1	Analogue access .....	28
7.9.2	Test points for bit stream measurements .....	28
7.9.3	Coupling arrangements .....	29
7.9.3.1	Arrangements for measurements with continuous bit streams .....	29
7.9.3.2	Arrangements for measurements with messages .....	29
7.10	Test site and general arrangements for measurements involving the use of radiated fields .....	29
7.11	Modes of operation of the transmitter .....	29
8	Methods of measurement for transmitter parameters .....	29
8.1	Frequency error .....	29
8.1.1	Definition .....	30
8.1.2	Method of measurement .....	30
8.2	Carrier power (conducted) .....	30
8.2.1	Definitions .....	30
8.2.1.1	Equipment measured as constant envelope angle modulation equipment .....	30
8.2.1.2	Equipment measured as non-constant envelope modulation equipment .....	30
8.2.2	Method of measurement .....	31
8.2.2.1	Equipment measured as constant envelope angle modulation equipment .....	31
8.2.2.2	Equipment measured as non-constant envelope modulation equipment .....	31
8.3	Effective radiated power (field strength) .....	31
8.3.1	Definition .....	31
8.3.1.1	Equipment measured as constant envelope angle modulation equipment .....	31
8.3.1.2	Equipment measured as non-constant envelope modulation equipment .....	32
8.3.2	Methods of measurement .....	32
8.3.2.1	Equipment measured as constant envelope angle modulation equipment .....	33
8.3.2.2	Equipment measured as non-constant envelope modulation equipment .....	34
8.4	Maximum permissible frequency deviation .....	35
8.4.1	Definition .....	35
8.4.2	Method of measurement .....	35
8.5	Adjacent channel power .....	36
8.5.1	Definition .....	36
8.5.2	Method of measurement .....	36
8.6	Spurious emissions .....	37
8.6.1	Definition .....	37
8.6.2	Method of measuring the power level .....	37

8.6.2.1	Equipment measured as constant envelope angle modulation equipment.....	38
8.6.2.2	Equipment measured as non-constant envelope modulation equipment.....	38
8.6.3	Method of measuring the effective radiated power.....	39
8.6.3.1	Equipment measured as constant envelope angle modulation equipment.....	39
8.6.3.2	Equipment measured as non-constant envelope modulation equipment.....	40
8.7	Intermodulation attenuation.....	41
8.7.1	Definition.....	41
8.7.2	Method of measurement.....	42
8.8	Transmitter attack time.....	42
8.8.1	Definition.....	43
8.8.2	Method of measurement.....	43
8.9	Transmitter release time.....	43
8.9.1	Definition.....	43
8.9.2	Method of measurement.....	44
8.10	Transient behaviour of the transmitter.....	44
8.10.1	Definitions.....	45
8.10.2	Timings, frequencies and powers.....	46
8.10.3	Methods of measurement.....	50
8.10.3.1	Time domain measurements of power and frequency.....	50
8.10.3.2	Test arrangement and characteristics of the deviation meter.....	51
8.10.3.3	Adjacent channel transient power measurements.....	51
8.10.3.3.1	Definition.....	51
8.10.3.3.2	Equipment measured as constant envelope angle modulation equipment.....	51
8.10.3.3.3	Equipment measured as non-constant envelope modulation equipment.....	52
8.10.3.4	Characteristics of the adjacent channel transient power measuring device.....	53
9	Methods of measurement for receiver parameters.....	54
9.1	Maximum usable sensitivity (data or messages, conducted).....	54
9.1.1	Definition.....	54
9.1.2	Method of measurement with continuous bit streams.....	54
9.1.3	Method of measurement with messages.....	54
9.2	Average usable sensitivity (data or messages, field strength).....	55
9.3	Level of the wanted signal for the degradation measurements (data or messages).....	55
9.4	Error behaviour at high input levels.....	56
9.4.1	Definition.....	56
9.4.2	Method of measurement with continuous bit streams.....	56
9.4.3	Method of measurement with messages.....	56
9.5	Co-channel rejection.....	57
9.5.1	Definition.....	57
9.5.2	Method of measurement with continuous bit streams.....	57
9.5.3	Method of measurement with messages.....	58
9.6	Adjacent channel selectivity.....	59
9.6.1	Definition.....	59
9.6.2	Method of measurement with continuous bit streams.....	59
9.6.3	Method of measurement with messages.....	60
9.7	Spurious response rejection.....	62
9.7.1	Definition.....	62
9.7.2	Introduction to the method of measurement.....	62
9.7.3	Method of search over the "limited frequency range".....	63
9.7.4	Method of measurement with continuous bit streams.....	63
9.7.5	Method of measurement with messages.....	64
9.8	Intermodulation response rejection.....	65
9.8.1	Definition.....	65
9.8.2	Method of measurement with continuous bit streams.....	65
9.8.3	Method of measurement with messages.....	66
9.9	Blocking or desensitization.....	68
9.9.1	Definition.....	68
9.9.2	Method of measurement with continuous bit streams.....	68
9.9.3	Method of measurement with messages.....	69
9.10	Spurious radiations.....	70
9.10.1	Definition.....	70
9.10.2	Method of measuring the power level.....	70

9.10.3	Method of measuring the effective radiated power.....	71
10	Duplex operation .....	73
10.1	Receiver desensitization (with simultaneous transmission and reception).....	73
10.1.1	Definition.....	73
10.1.2	Desensitization measured with continuous bit streams.....	73
10.1.2.1	Method of measurement when the equipment has a duplex filter.....	73
10.1.2.2	Method of measurement when the equipment has to operate with two antennas.....	74
10.1.3	Desensitization measured with messages .....	75
10.1.3.1	Method of measurement when the equipment has a duplex filter .....	75
10.1.3.2	Method of measurement when the equipment has to operate with two antennas.....	76
10.2	Receiver spurious response rejection (with simultaneous transmission and reception) .....	77
10.2.1	Definition.....	77
10.2.2	Method of measurement .....	77
11	Measurement uncertainty .....	78
<b>Annex A (normative): Radiated measurement.....</b>		<b>79</b>
A.1	Test sites and general arrangements for measurements involving the use of radiated fields .....	79
A.1.1	Anechoic Chamber .....	79
A.1.2	Anechoic Chamber with a conductive ground plane .....	80
A.1.3	Open Area Test Site (OATS) .....	81
A.1.4	Test antenna.....	82
A.1.5	Substitution antenna .....	83
A.1.6	Measuring antenna .....	83
A.2	Guidance on the use of radiation test sites .....	83
A.2.1	Verification of the test site .....	83
A.2.2	Preparation of the EUT.....	83
A.2.3	Power supplies to the EUT.....	83
A.2.4	Volume control setting for analogue speech tests .....	84
A.2.5	Range length.....	84
A.2.6	Site preparation .....	84
A.3	Coupling of signals.....	85
A.3.1	General .....	85
A.3.2	Data Signals.....	85
A.3.3	Speech and analogue signals .....	85
A.3.3.1	Acoustic coupler description.....	85
A.3.3.2	Calibration .....	86
<b>Annex B (normative): Specification for some particular measurement arrangements.....</b>		<b>87</b>
B.1	Power measuring receiver specification.....	87
B.1.1	IF filter .....	87
B.1.2	Attenuation indicator.....	88
B.1.3	rms value indicator .....	88
B.1.4	Oscillator and amplifier.....	88
B.2	Spectrum analyser specification.....	89
B.3	Integrating and power summing device .....	89
<b>Annex C (normative): Identification .....</b>		<b>90</b>
C.1	Scope .....	90
C.2	General .....	90
C.3	Position of the identification code.....	91
C.3.1	Base stations.....	91
C.3.1.1	System without windows .....	91
C.3.1.2	Systems with windows.....	91
C.3.2	Mobile stations .....	91
C.4	Bit rates and modulations .....	92



C.5	Format of the identification.....	93
C.6	Synchronization.....	93
C.7	Code and block length.....	94
C.8	Contents of the identification block .....	94
C.8.1	Header .....	94
C.8.2	Country/regional code .....	95
C.8.3	National Information .....	96
C.8.3.1	Field description .....	96
C.8.3.2	Field size options .....	96
C.8.3.3	Options for the organization of the fields .....	97
C.8.3.4	Examples of user/system information usage.....	97
C.9	Combinations .....	98
C.9.1	List of possible combinations.....	98
C.9.2	Relations between country/regional code and allowed combinations .....	98
C.9.3	Interpretation of the fields of the ID block.....	99
<b>Annex D (normative):</b>	<b>Graphical representation of the selection of equipment and frequencies for testing .....</b>	<b>100</b>
D.1	Tests on a single sample.....	100
D.2	Tests and samples needed when the switching range is a subset of the alignment range .....	101
D.3	Tests and samples for a family of equipment where the alignment range is a subset of the total operating frequency range.....	102
D.3.1	Test scenario 1.....	102
D.3.2	Test scenario 2.....	103
<b>Annex E (informative):</b>	<b>Information on modulation, coding and format .....</b>	<b>104</b>
<b>Annex F (informative):</b>	<b>Bibliography.....</b>	<b>105</b>
History .....	.....	106

---

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

The present document was previously submitted to V20010125 and due to technical errors was withdrawn.

The present document is part 1 of a multi-part deliverable covering the Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector, as identified below:

- Part 1:** "Technical characteristics and methods of measurement";  
**Part 2:** "Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive".

### National transposition dates

Date of adoption of this EN:	15 February 2002
Date of latest announcement of this EN (doa):	31 May 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2002
Date of withdrawal of any conflicting National Standard (dow):	30 November 2002

---

## Introduction

The present document is intended to specify the minimum performance and the methods of measurement of radio equipment for use in the land mobile service as specified in the scope.

The present document is based upon EN 300 113-1 (version 1.3.1) [10].

EN 300 113-1 (version 1.3.1) [10] covered only constant envelope angle modulation equipment. The present document covers both constant envelope angle modulation and non-constant envelope modulation equipment as described in the scope.

This is a general standard which may be overridden or complemented by specific standards addressing specific applications. It applies to equipment designed to operate within the professional mobile radio service and to the associated frequency planning.

Equipment similar to that covered by the present document, but using constant envelope modulation only (at the time of publication of present document) and having an integral antenna is covered by EN 300 390 [2] (for details, see the scope of the present document as well as the scope of EN 300 390 [2]).

Access protocols for equipment covered by the present document are the subject of other ETSI standards such as EN 300 471-1 [11].

Channel separations, maximum transmitter output power/effective radiated power, class of transmitter intermodulation attenuation and the inclusion of automatic transmitter shut-off facility may all be conditions relating to the issue of a licence by the appropriate administration.

- Annex A: is normative and provides additional information concerning radiated measurements.
- Annex B: is normative and gives the requirements for equipment to be used for the measurements of adjacent channel power.
- Annex C: is normative and presents the technical characteristics to be fulfilled, when required by the appropriate national regulatory authority, for the identification of stations for professional mobile radio systems, that do not comply with other system protocols (e.g. trunking protocols); it is the responsibility of the manufacturer to ensure that the modulation that he has chosen for the identification, in accordance with the tables of this annex fulfils the requirements corresponding to the channels where the equipment is designed to operate, as specified in the main body of the present document. The tables of this annex are expected to be updated regularly in order to reflect the progress accomplished in the field of mobile data transmissions.
- Annex D: is informative and gives a graphic representation corresponding to the selection of equipment for testing purposes (it is based on EN 300 793 [3]).
- Annex E: is informative and provides guidance concerning the technical characteristics of the modulation, coding and format.

Clause 5 provides the appropriate limits. These limits have been chosen to ensure an acceptable grade of service and to minimize harmful interference to other equipment and services. They are based on the interpretation of the measurement results described in clause 4.3.

Provision for the placing on the market of radio equipment in EU Member States can be found in the R&TTE Directive (Directive 1999/5/EC). It can also be noted that some of the parameters considered as essential under the R&TTE Directive had already been listed as essential under the EMC Directive.

The present document may also be used in CEPT Countries that are not EU Member States. For the benefit of these Countries, mechanisms for mutual recognition of type approval have been identified in CEPT/ERC/DEC(97)10.

Alternatively, another approach may be used in Countries that have not implemented this Decision: type test measurements performed in an accredited test laboratory in one country would be accepted by the Administration in another country provided that the national regulatory requirements are met (CEPT/ERC/REC 01-06).

Decision CEPT/ERC/DEC(97)10 also addresses issues related to total quality management.

The present document may, in particular, be used by accredited test laboratories for the assessment of the performance of the equipment. The performance of the equipment, in the case of conformity assessment measurements, shall be representative for the performance of the corresponding production model. In order to avoid any ambiguity in that assessment, the present document contains general instructions (clause 4), conditions (clauses 6 and 7) and methods of measurement (clauses 8, 9 and 10).

The present document was drafted on the assumption that if equipment available on the market is required to be checked, it should be tested in accordance with the methods of measurement specified in the present document.

# 1 Scope

The present document covers the minimum characteristics considered necessary in order to avoid harmful interference and to make acceptable use of the available frequencies. It does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

The present document applies to either constant envelope angle modulation systems or to non-constant envelope modulation systems for use in the land mobile service, operating on radio frequencies between 30 MHz and 1 GHz, with channel separations of 12,5 kHz, 20 kHz and 25 kHz, intended for data transmissions. It applies to digital and combined analogue and digital radio equipment with an internal or external antenna connector intended for the transmission of data and/or speech.

The particular type of modulation will be chosen by the manufacturer, although it is recognized that in some countries national legislation may limit the use of certain code structures/data formats.

The technical characteristics given in the present document are independent of data rate but may in practice limit the maximum data rate achievable.

In the present document different requirements are given for the different radio frequency bands, channel separations, etc. where appropriate.

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

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

- base station (equipment fitted with an antenna socket, intended for use in a fixed location);
- mobile station (equipment fitted with an antenna socket, normally used in a vehicle or as a transportable);
- and those hand portable stations:
  - a) fitted with an antenna socket;
  - b) without an external antenna socket (integral antenna equipment), but fitted with a permanent internal or a temporary internal 50  $\Omega$  Radio Frequency (RF) connector which allows access to the transmitter output and the receiver input.

Hand portable equipment without an external or internal RF connector and without the possibility of having a temporary internal 50  $\Omega$  RF connector is not covered by the present document (integral antenna equipment is covered by EN 300 390 [2] for details, see the corresponding scope).

Additional standards or specifications may also be required for equipment such as that intended for connection to the Public Switched Telephone Network (PSTN), or data networks.

Requirements to be fulfilled by equipment designed to meet several standards can be found in clause 4.

## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- 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.
- For a non-specific reference, the latest version applies.

- [1] ETSI EN 300 086 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech".
- [2] ETSI EN 300 390 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna".
- [3] ETSI EN 300 793: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Presentation of equipment for type testing".
- [4] ETSI TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [5] ETSI ETR 273 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties".
- [6] ITU-T Recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate".
- [7] ANSI/IEEE C63.5 (1998): "American National Standard for Electromagnetic Compatibility - Radiated Emission Measurements in Electro Magnetic Interference (EMI) Control - Calibration of Antennas (9 kHz to 40 GHz)".
- [8] IEC 60489-3 (1988): "Methods of measurement for radio equipment used in the mobile services. Part 3: Receivers for A3E or F3E emissions".
- [9] CEPT/ERC/REC 74-01E (Siófok 1998, Nice 1999): "Spurious emissions".
- [10] ETSI EN 300 113-1 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and speech) and having an antenna connector; Part 1: Technical characteristics and methods of measurement".
- [11] ETSI EN 300 471-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Rules for Access and the Sharing of common used channels by equipment complying with EN 300 113; Part 1: Technical characteristics and methods of measurement".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**base station:** equipment fitted with an antenna socket, for use with an external antenna, and intended for use in a fixed location

**mobile station:** mobile equipment fitted with an antenna socket, for use with an external antenna, normally used in a vehicle or as a transportable station

**hand portable station:** equipment either fitted with an antenna socket or integral antenna, or both, normally used on a stand-alone basis, to be carried on a person or held in the hand

**integral antenna:** antenna designed to be connected to the equipment without the use of a 50  $\Omega$  external connector and considered to be part of the equipment

NOTE: An integral antenna may be fitted internally or externally to the equipment.

**angle modulation:** either phase modulation or frequency modulation

**full tests:** All tests are defined in EN 300 113-1.

**limited tests:** limited tests, as defined in EN 300 793 [3], are as follows:

- transmitter frequency error, clause 8.1;
- transmitter carrier power (conducted), clause 8.2;
- transmitter effective radiated power, clause 8.3, integral antenna equipment only;
- transmitter adjacent channel power, clause 8.5;
- receiver maximum usable sensitivity (conducted): clause 9.1;
- receiver average usable sensitivity (field strength), clause 9.2, integral antenna equipment only;
- receiver adjacent channel selectivity, clause 9.6.

**conducted measurements:** measurements which are made using direct 50  $\Omega$  connection to the equipment under test

**radiated measurements:** measurements which involve the absolute measurement of a radiated field

**bit:** binary digit

**block:** smallest quantity of information that is sent over the radio channel

NOTE: A constant number of useful bits are always sent together with the corresponding redundancy bits.

**packet:** one block or a contiguous stream of blocks sent by one (logical) transmitter to one particular receiver or one particular group of receivers

**transmission (physical):** one or several packets transmitted between power on and power off of a particular transmitter

**window:** set of inter-related transmissions which may be limited in time by an appropriate access protocol and corresponding occupation rules

**session:** set of inter-related exchange of packets occupying one or several windows or part thereof (if applicable)

NOTE: It corresponds to a complete interactive procedure for interchanging data between users, comprising initiation, data transmission and termination procedures. The session can be short (e.g. 2 packets), or long (e.g. one full page of text).

**message:** user data to be transferred in one or more packets in a session

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

E <sub>o</sub>	reference field strength
R <sub>o</sub>	reference distance
dBd	antenna gain relative to $\lambda/2$ dipole (clause A.1.3)
dBi	antenna gain relative to an isotropic radiator (clause A.1.3)
D-M0, D-M1...	names of signals defined in clause 7.3

The symbols used in the clauses relating to transients and timings can be found in clause 8.10.1.

### 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AR1, AR2	Categories of "alignment range" as defined in clause 4.1
BS	Base Station
CRC	Cyclic Redundancy Code
CSP	Channel Separation
CW	Continuous Wave
dBc	decibels relative to the carrier power
emf	electromotive force
FEC	Forward Error Correction
FFSK	Fast Frequency Shift Keying
FSK	Frequency Shift Keying
GMSK	Gaussian Minimum Shift Keying
IF	Intermediate Frequency
LSB	Least Significant Bit
MSB	Most Significant Bit
MSK	Minimum Shift Keying
OQAM	Offset Quadrature Amplitude Modulation
OQPSK	Offset Quaternary Phase Shift Keying
PEP	Peak Envelope Power
PLL	Phase Locked Loop
PSK	Phase Shift Keying
PSTN	Public Switched Telephone Network
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
rms	root mean square
sr	switching range
Tx	Transmitter

STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN 300 113-1 V1.4.1:2003

<https://standards.iteh.ai/catalog/standards/sist/4474729e-84d2-4207-93e9-d30138b8b269/sist-en-300-113-1-v1-4-1-2003>

## 4 General

Equipment may be designed to fulfil the requirements of one or more standards.

In the case of combined full bandwidth analogue speech/full bandwidth digital equipment, if the analogue part of the equipment has already been measured according to EN 300 086 [1], only some additional measurements have to be performed; they shall ensure that the equipment fulfils the requirements of the following clauses:

- 5.1.4 (8.5) Adjacent channel power;
- 5.1.5 (8.6) Spurious emissions;
- 5.1.7 (8.8) Transmitter attack time;
- 5.1.8 (8.9) Transmitter release time;
- 5.1.9 (8.10) Transient behaviour of the transmitter;
- 5.2.1 (9.1) Maximum usable sensitivity (data or messages, conducted);
- 5.2.2 (9.2) Average usable sensitivity (data or messages, field strength) in the case of equipment having an integral antenna;
- 5.2.3 (9.4) Error behaviour at high input levels;
- 5.2.4 (9.5) Co-channel rejection;
- 5.2.5 (9.6) Adjacent channel selectivity.