SLOVENSKI STANDARD
oSIST prEN 300 113 V2.3.0:2020

01-junij-2020

Storitev kopenskih mobilnih komunikacij - Radijska oprema za prenos podatkov (oziroma govora), ki uporablja modulacijo s konstantno ali nekonstantno ovojnico in ima antenski priključek

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

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

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Modal verbs terminology

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1 Scope

The present document covers the technical requirements for radio transmitters and receivers used in stations in the Private Mobile Radio (PMR) service.

It applies to 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 speech and/or data.

Table 1: Radiocommunications service frequency bands

	Radiocommunications service frequency bands
Transmit	30 MHz to 1 000 MHz
Receive	30 MHz to 1 000 MHz

It applies to equipment for continuous and/or discontinuous transmission of data and/or digital speech.

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:

1) base station (equipment fitted with an antenna connector, intended for use in a fixed location);

2) mobile station (equipment fitted with an antenna connector, normally used in a vehicle or as a transportable); and

3) those handportable stations:

   a) fitted with an antenna connector; or

   b) without an external antenna connector , but fitted with a permanent internal or a temporary internal 50 Ω Radio Frequency (RF) connector which allows access to the transmitter output and the receiver input.

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

2 References

2.1 Normative references

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[1] ETSI EN 300 086 (V2.1.2) (08-2016): "Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".

[2] ETSI EN 300 390 (V2.1.1) (03-2016): "Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".

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[3] Void.

[4] Recommendation ITU-T O.153 (10/1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[5] IEEE/ANSI C63.5 (2017): "American National Standard for Electromagnetic Compatibility -- Radiated Emission Measurements in Electromagnetic Interference (EMI) Control -- Calibration and Qualification of Antennas (9 kHz to 40 GHz)".

[6] Void.

[7] CEPT/ERC/Recommendation 74-01E: "Unwanted emissions in the spurious domain" (Siófok 1998, Nice 1999, Sesimbra 2002, Hradec Kralove 2005).

[8] Void.

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[i.1] ETSI TR 102 273 (V1.2.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".

[i.2] Void.

[i.3] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.4] ETSI EN 300 793 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Presentation of equipment for type testing".

[i.5] ETSI TR 100 028 (V1.4.1) (12-2001) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[i.6] ETSI TR 100 028-2 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

[i.7] IEC 60489-3 (1988): "Methods of measurement for radio equipment used in the mobile services. Part 3: Receivers for A3E or F3E emissions".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

50 Ω: 50 ohm non-reactive impedance

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adaptive bit rate equipments: equipments that change bit rate such that a bit rate that is compliant with the present document is always selected if communication is not possible at other bit rates

adjacent channels: channel offset from the wanted channel by the channel spacing (see figure 1)

alternate channels: two channels offset from the wanted channel by double the channel spacing (see figure 1)

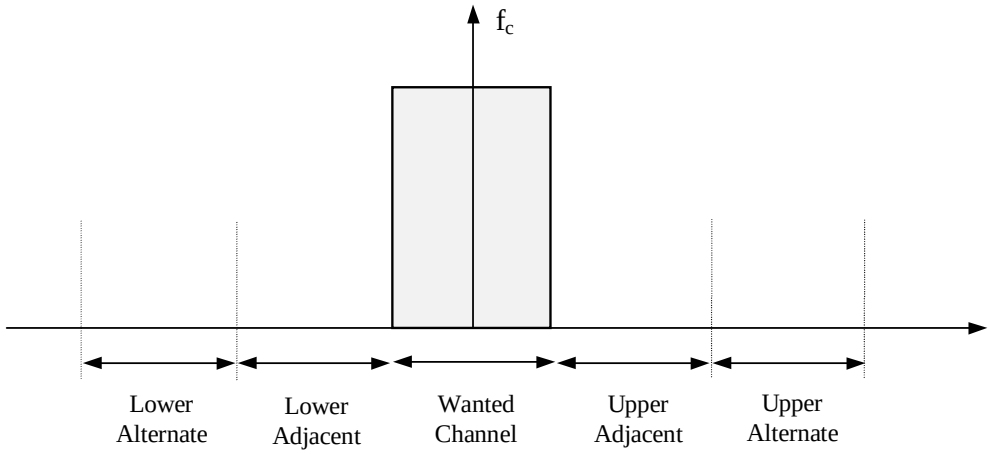

Figure 1: Adjacent and alternate channel definitions

angle modulation: either phase modulation or frequency modulation

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

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.

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

conducted measurements: measurements which are made using direct 50 Ω connection to the equipment under test

data transmission systems: systems which transmit and/or receive data and/or digitized voice

handportable station: equipment either fitted with an antenna connector 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 Ω external connector and considered to be part of the equipment

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

manufacturer: any natural or legal person who manufactures radio equipment or has radio equipment designed or manufactured, and markets that equipment under his name or trade mark

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

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

multi-rate equipment: equipment that supports multiple (i.e. two or more) on-air bit rates or symbol rates

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

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Peak Envelope Power (PEP): mean power delivered to the artificial antenna during a radio frequency cycle at the highest crest of the modulation envelope

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

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

NOTE: 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).

switching range: maximum frequency range, as specified by the manufacturer, over which the receiver or the transmitter can be operated within the alignment range without reprogramming or realignment

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

3.2 Symbols

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

D-M0, D-M1, etc. names of signals defined in clause 6.3.1 and clause 6.3.2

NOTE: The symbols used in the clauses relating to transients and timings can be found in clause 7.9.1.

f_{I1}	1st intermediate frequency
f_{I2}	2nd intermediate frequency
f_{In}	n^{th} intermediate frequency
f_l	frequency of the limited frequency range
f_{LO}	Local oscillator frequency
T_{max}	Maximum extreme test temperature
T_{min}	Minimum extreme test temperature
V_{max}	Maximum extreme test voltage
V_{min}	Minimum extreme test voltage

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[illegible]/sist-en-300-113-v3-1-1-2020

3.3 Abbreviations

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

ac	alternating current
BW	BandWidth
CBW	Channel BandWidth
CEPT	European Conference of Postal and Telecommunications administrations
CSP	Channel SeParation
CW	Continuous Wave
dB	decibel
dBc	decibels relative to the carrier power
dBm	dB relative to 1 mW in 50 ohms
dc	direct current
EC	European Community
emf	electromotive force
EU	European Union
EUT	Equipment Under Test
FM	Frequency Modulation
FSK	Frequency Shift Keying
GMSK	Gaussian Minimum Shift Keying
IEC	International Electrotechnical Commission
IF	Intermediate Frequency
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector

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OATS	Open Area Test Site
PEP	Peak Envelope Power
PLL	Phase Locked Loop
PMR	Private Mobile Radio
RBW	Relative BandWidth
RF	Radio Frequency
rms	root mean square
Rx	Receiver
SINAD	SIgnal, Noise And Distortion
sr	switching range
Tx	Transmitter
VSWR	Voltage Standing Wave Ratio

4 General and operational requirements

4.1 General

4.1.1 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, but as a minimum, shall be that specified in the test conditions contained in the present document.

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4.1.2 Choice of model for testing

Stand-alone equipment shall be complete with any ancillary equipment needed for testing.

If an equipment has several optional features, considered not to affect the RF parameters, then the tests need only be performed on the equipment configured with the combination of features considered to be the most complex.

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Where practicable, equipment to be tested shall provide a 50 Ω connector for conducted RF power level measurements.

In the case of integral antenna equipment, if the equipment does not have an internal permanent 50 Ω connector then it is permissible to use a second sample of the equipment with a temporary antenna connector fitted to facilitate testing. Any such modified sample shall not be used for any radiated measurements, except as noted in clause 5.5.3.

The performance of the equipment to be tested shall be representative of the performance of the corresponding production model.

Guidance on the presentation of equipment is also given in ETSI EN 300 793 [i.4].

4.2 Mechanical and electrical design

4.2.1 General

The equipment should be designed, constructed and manufactured in accordance with good engineering practice, and with the aim of avoiding harmful interference to other equipment and services.

4.2.2 Controls

Those controls, which if maladjusted, might increase the interfering potentialities of the equipment shall not be accessible for adjustment by the user.