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**Citizens' Band (CB) radio equipment;
Harmonised Standard covering the essential requirements
of article 3.2 of the Directive 2014/53/EU**

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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
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Foreword

This draft Harmonised 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.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.5] 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.4].

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 C.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.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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.

1 Scope

The present document covers the technical requirements for transmitters and receivers used in stations of angle modulated, Double Side Band (DSB) modulated and/or Single Side Band (SSB) modulated Citizens' Band (CB) radio equipment operating in all or part of the frequency band 26,960 MHz to 27,410 MHz with a channel spacing of 10 kHz, and intended for analogue speech and/or data transmission.

Citizens' Band radio equipment operation is in accordance with ECC Decision (11)03 on the harmonised use of frequencies for Citizens' Band (CB) radio equipment [i.2].

Any equipment using national regulations on Citizens' Band (CB) permitting the use of channels outside of the carrier frequencies shown in table 1 within the frequency range from 26 MHz to 28 MHz can use the present document.

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.
- Hand portable 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.

Hand portable 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 (integral antenna equipment).

The present document contains requirements to demonstrate that "... *Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference*" and that "...*radio equipment supports certain features ensuring access to emergency services*".

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 Radio Equipment Directive [i.4] may apply to equipment within the scope of the present document.

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 <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] 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".
- [2] CISPR 16-2 (All parts) (2014) : "Specifications for radio disturbance and immunity measuring apparatus and methods".
- [3] Recommendation ITU-T O.41 (10-1994): "Psophometer for use on telephone-type circuits".

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

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 referenced 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] 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] ECC Decision (11)03: "The harmonised use of frequencies for Citizen's Band (CB) radio equipment".
- [i.3] ITU Radio Regulations (2012).
- [i.4] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 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.5] 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.6] ANSI C63.5 (2006): "American National Standard for Electromagnetic Compatibility - Radiated Emission Measurements in Electromagnetic Interference (EMI) Control - Calibration and Qualification of Antennas (9 kHz to 40 GHz)". ANSI C63.5 (2006): "American National Standard for Calibration of Antennas Used for Radiated Emission Measurements in Electro Magnetic Interference".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

adjacent channels: channel offset from the wanted channel by the channel spacing

NOTE: See figure 0.

alternate channels: two channels offset from the wanted channel by double the channel spacing

NOTE: See figure 0.

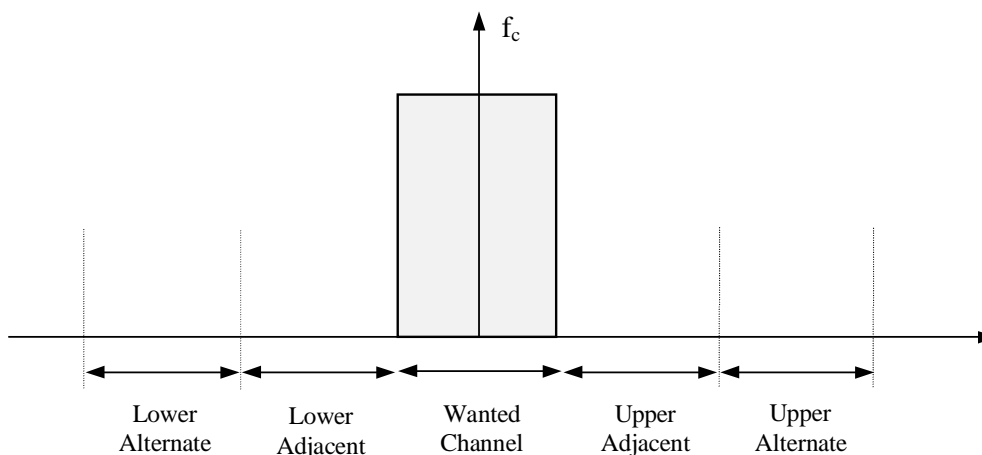


Figure 0: Adjacent and alternate channel definitions

angle modulations: F3E/G3E classes of emission

NOTE: As defined in the ITU Radio Regulations [i.3], corresponding to modulation with an audio pre-emphasis characteristic for the FM transmitter and an audio de-emphasis characteristic for the receiver.

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

Double Side Band (DSB) modulation: A3E class of emission

NOTE: As defined in the ITU Radio Regulations [i.3], corresponding to double side band amplitude modulation (AM).

hand portable station: equipment either fitted with an antenna connector or an 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 as a fixed part of the equipment, without the use of an external connector and as such which cannot be disconnected from the equipment by the user

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

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

Single Side Band (SSB) modulation: J3E class of emission

NOTE: As defined in the Sub-Section IIA of Volume II Appendices of the ITU Radio Regulations [i.3], corresponding to single side band suppressed carrier amplitude modulation, using either USB or LSB.

3.2 Symbols

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

λ	Wavelength
Ω	Ohms

3.3 Abbreviations

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

AC	Alternating Current
AM	Amplitude Modulation
CB	Citizen's Band
CEPT	European Conference of Postal and Telecommunications Administrations
CISPR	Comité International Spécial des Perturbations Radioélectriques

CW	Continuous Wave
DC	Direct Current
DSB	Double Side Band
EC	European Commission
ECC	Electronic Communications Committee
EFTA	European Free Trade Association
emf	electromotive force
EUT	Equipment Under Test
FM	Frequency Modulation
IEC	International Electrotechnical Commission
IF	Intermediate Frequency
ITU	International Telecommunication Union
LSB	Lower Side Band
ND	Noise + Distortion
OATS	Open Area Test Site
PEP	Peak Envelope Power
PTT	Push-To-Talk
RBW	Resolution BandWidth
RF	Radio Frequency
RMS	Root Mean Square
RR	Radio Regulations
RX	Receiver/reception
SINAD	(Signal + Noise + Distortion)/(Noise + Distortion) ratio
SND	Signal + Noise + Distortion
SSB	Single Side Band
TR	Technical Report
TX	Transmitter/Transmission
USB	Upper Side Band
VSWR	Voltage Standing Wave Ratio

4 General and operational requirements

4.0 General

Equipment shall fulfil the requirements of the present document on all frequencies over which it is intended to operate.

The provider or supplier shall declare the frequency ranges, the range of operating conditions and power requirements as applicable, to establish the appropriate test conditions.

The equipment shall be tested to the present document using the type of modulation signal defined in clause 6.5 that is relevant to the operational mode being tested, i.e. angle modulation, DSB or SSB. Angle modulation is considered as equivalent to frequency modulation (FM) with pre-emphasis in transmit mode and de-emphasis in receive mode.

Equipment capable of using two or three types of modulation among angle modulation, DSB and SSB shall be tested to the present document using the respective type of modulation for each mode (see clause 6.5).

4.1 Choice of model for testing

4.1.0 General

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 to be performed on the equipment configured with that combination of features considered to be the most complex.

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 a second sample of the equipment shall be used with a temporary antenna connector fitted to facilitate testing.

Tests shall be carried out on the highest and lowest channel within the switching range of the equipment and on a channel near the middle of the switching range. The switching range of the receiver and transmitter shall be declared by the supplier. The switching range is the maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment. In the case of equipment fitted with one channel only, all tests are carried out on that channel. In the case of equipment fitted with two channels, all tests are carried out on both channels.

4.1.1 Auxiliary test equipment

All necessary test signal sources, setting up instructions and other product information shall accompany the equipment to be tested.

4.1.2 Declarations by the provider

All necessary setting up instructions and other product information shall be made available with the equipment to be tested, in accordance with article 10.8 of Directive 2014/53/EU [i.4].

4.2 Testing of equipment that does not have an external 50 Ω RF connector (integral antenna equipment)

Where equipment has an internal 50 Ω connector it shall be permitted to perform the tests at this connector.

Equipment may also have a temporary internal 50 Ω connector installed for the purposes of testing.

No connection shall be made to any internal permanent or temporary antenna connector during the performance of radiated emissions measurements, unless such action forms an essential part of the normal intended operation of the equipment, as declared by the supplier.

4.3 Mechanical and electrical design

4.3.1 General

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

4.3.2 Controls

Those controls which if maladjusted might increase the interfering potentialities of the equipment shall not be accessible to the user.

4.3.3 PTT and voice- activated switch

Switching between the transmit and receive mode of operation shall only be possible by means of a non-locking PTT switch or by means of a non-locking voice-activated switch. If a voice-activated switch is used it shall not respond to ambient acoustic noise.

For SSB CB equipment with a microphone jack, the threshold level adjustment shall be accessible to the user. For DSB/angle modulated and/or CB equipment with a microphone jack, the threshold level adjustment may be accessible to the user.

All adjustments accessible by the user that have influence on the threshold shall be safe against unintended change of setting.

4.3.4 Combination with other equipment

The equipment shall not be combined with any other form of transmitting or receiving equipment, which can produce unwanted modulation of the transmitter. The equipment shall not be provided with any terminals or other connection points, internal or external, for modulating sources other than those required for either a separate or a built-in microphone, or for selective calling or data transmission devices.

Terminals or other connecting points are permitted for the connection of external devices that shall not modulate the transmitters (e.g. a voice synthesizer device to give an aural indication of channel).

4.4 Operating frequencies

Citizen's Band radio equipment operating in accordance with ECC Decision (11)03 [i.2] shall use on one or more channels of the carrier frequencies as shown in table 1. The channel separation is 10 kHz.

Table 1: Carrier frequencies

Carrier frequencies	Channel Number	Carrier frequencies	Channel Number
26,965 MHz	1	27,215 MHz	21
26,975 MHz	2	27,225 MHz	22
26,985 MHz	3	27,235 MHz	24
27,005 MHz	4	27,245 MHz	25
27,015 MHz	5	27,255 MHz	23
27,025 MHz	6	27,265 MHz	26
27,035 MHz	7	27,275 MHz	27
27,055 MHz	8	27,285 MHz	28
27,065 MHz	9	27,295 MHz	29
27,075 MHz	10	27,305 MHz	30
27,085 MHz	11	27,315 MHz	31
27,105 MHz	12	27,325 MHz	32
27,115 MHz	13	27,335 MHz	33
27,125 MHz	14	27,345 MHz	34
27,135 MHz	15	27,355 MHz	35
27,155 MHz	16	27,365 MHz	36
27,165 MHz	17	27,375 MHz	37
27,175 MHz	18	27,385 MHz	38
27,185 MHz	19	27,395 MHz	39
27,205 MHz	20	27,405 MHz	40

Citizen's Band radio equipment operating under other national regulations shall use frequencies within the 26 MHz to 28 MHz band and the frequencies used shall be clearly listed in the user information, along with details of those national regulations that it complies with.

Transmission and reception takes place on the same channel (single frequency simplex mode).

4.5 Marking

The equipment shall be marked in a visible place. This marking should be legible, tamperproof and durable.

The marking shall be in accordance with EC Directives and/or CEPT decisions or recommendations as appropriate.

5 Test conditions, power sources and ambient temperatures

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

All necessary setting up instructions and other product information shall be made available with the equipment to be tested, in accordance with article 10.8 of Directive 2014/53/EU [i.4].

5.1 Normal and extreme test conditions

Testing shall be performed under normal test conditions, and also, where stated, under extreme test conditions.

The test conditions and procedures shall be as specified in clauses 5.2 to 5.5.