



**HARMONISED EUROPEAN STANDARD**

**ElectroMagnetic Compatibility (EMC)  
standard for radio equipment and services;  
Part 5: Specific conditions for  
Private land Mobile Radio (PMR) and  
ancillary equipment (speech and non-speech) and  
Terrestrial Trunked Radio (TETRA);  
Harmonised Standard for ElectroMagnetic Compatibility**

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**Reference**REN/ERM-EMC-419

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**Keywords**EMC, harmonised standard, PMR, radio,  
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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 Standardisation Request deliverable Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.3] 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.1].

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 A.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.

The present document is part 5 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

National transposition dates	
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## 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).

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# 1 Scope

The present document specifies the applicable test conditions, performance assessment and performance criteria technical characteristics, test methods and methods of measurement for the assessment of Private land Mobile Radio (PMR) and associated ancillary equipment, in respect of ElectroMagnetic Compatibility (EMC).

The present document covers both analogue and digital Private land Mobile Radio (PMR) equipment as well as Terrestrial Trunked Radio (TETRA).

Technical specifications related to the antenna port and emissions from the enclosure port of the equipment are outside of the scope of the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum, see Table 1.

Emissions requirements in the present document are specified for frequencies above 9 kHz.

**Table 1: Radio Technologies in scope of the present document**

Technology	ETSI Standard
Land Mobile Service; Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 302 561 [i.2]
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	ETSI EN 300 086 [i.4]
Land Mobile Service; Radio equipment transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 300 219 [i.5]
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; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 300 113 [i.6]
Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 300 296 [i.7]
Land Mobile Service; Radio equipment using an integral antenna transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 300 341 [i.8]
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	ETSI EN 300 390 [i.9]
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; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	ETSI EN 301 166 [i.10]
TETRA radio equipment using non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard for access to radio spectrum	ETSI EN 303 758 [i.11]

NOTE 1: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.1] is given in annex A.

Technical specifications related to conducted emission EMC requirements below 9 kHz on the AC mains port of radio equipment are not included in the present document.

NOTE 2: Such technical specifications are normally found in the relevant product family standards for AC mains powered equipment (e.g. EN 61000-3-2 [i.12] and EN 61000-3-3 [i.13]).

The environmental classification as per ETSI EN 301 489-1 [1] applies.

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## 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.

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The following referenced documents are necessary for the application of the present document.

- [1] [ETSI EN 301 489-1 \(V2.2.3\) \(11-2019\)](#): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility".
- [2] [ETSI EN 300 394-1 \(V3.3.1\) \(04-2015\)](#): "Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 1: Radio".
- [3] [ETSI EN 300 395-2 \(V1.3.1\) \(01-2005\)](#): "Terrestrial Trunked Radio (TETRA); Speech codec for full-rate traffic channel; Part 2: TETRA codec".
- [4] Void.
- [5] Void.

### 2.2 Informative references

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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] [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.2] ETSI EN 302 561: "Land Mobile Service; Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [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 300 086: "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".

- [i.5] ETSI EN 300 219: "Land Mobile Service; Radio equipment transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.6] ETSI EN 300 113: "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; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.7] ETSI EN 300 296: "Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.8] ETSI EN 300 341: "Land Mobile Service; Radio equipment using an integral antenna transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.9] ETSI EN 300 390: "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".
- [i.10] ETSI EN 301 166: "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; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".
- [i.11] ETSI EN 303 758: "TETRA radio equipment using non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard for access to radio spectrum".
- [i.12] EN 61000-3-2: "Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)", (produced by CEN).
- [i.13] EN 61000-3-3: "Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection", (produced by CEN).

ETSI EN 301 489-5 V2.2.8 (2024-09)

## 3 Definitions of terms, symbols and abbreviations

### 3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 301 489-1 [1] and the following apply:

**ancillary equipment:** electrical or electronic equipment, that is intended to be used with a receiver or transmitter

NOTE 1: It is considered as an ancillary equipment if:

- the equipment is intended for use with a receiver or transmitter to provide additional operational and/or control features to the radio equipment (e.g. to extend control to another position or location);
- the ancillary equipment cannot be used without being connected to radio equipment to provide user functions independently of a receiver or transmitter; and
- the receiver or transmitter, to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

NOTE 2: An example of ancillary equipment would be a docking station for radio equipment whose interface is dedicated to a particular product or range of products.

**antenna port:** port, for connection of an antenna used for intentional transmission and/or reception of radiated RF energy

**base station:** radio equipment intended for operation at a fixed location which is not defined as portable equipment

**continuous phenomena (continuous disturbance):** electromagnetic disturbance, the effects of which on a particular device or equipment cannot be resolved into a succession of distinct effects

**critical stored data:** data that is essential for an EUT to perform a primary function in accordance with that EUT's specification

**enclosure port:** physical boundary of the equipment through which electromagnetic fields may radiate or impinge

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

**portable equipment:** radio equipment intended for portable use and powered by integral batteries or battery

## 3.2 Symbols

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

$P_{min}$  minimum power required to establish a communication link

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 301 489-1 [1] and the following apply:

BER	Bit Error Ratio
CR	Continuous phenomena applied to Receivers
CT	Continuous phenomena applied to Transmitters
EUT	Equipment Under Test
PMR	Private land Mobile Radio
TETRA	TErrestrial Trunked RAdio
TR	Transient phenomena applied to Receivers
TT	Transient phenomena applied to Transmitters

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# 4 Test conditions

## 4.1 General

For the purposes of the present document, the test conditions of ETSI EN 301 489-1 [1], clause 4 shall apply with the following additions. Further product related test conditions for PMR and TETRA equipment are specified in the present document.

## 4.2 Arrangements for test signals

### 4.2.1 Arrangements for test signals at the input of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.1 shall apply.

### 4.2.2 Arrangements for test signals at the output of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.2 shall apply with the following modification.

The transmitter shall be operated at its maximum rated RF output power, modulated with normal test modulation (see clause 4.5).