



# SLOVENSKI STANDARD

## SIST ETS 300 279:1999

01-junij-1999

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**Radijska oprema in sistemi (RES) - Standard elektromagnetne združljivosti (EMC) za zasebni mobilni radio (PMR) in pomožno opremo (govorno oziroma negovorno)**

Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for Private land Mobile Radio (PMR) and ancillary equipment (speech and/or non-speech)

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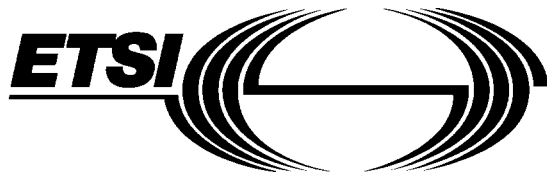
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ElectroMagnetic Compatibility (EMC) standard for Private  
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## Foreword

This (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Other ETSs cover radiocommunications equipment not listed in the scope.

This ETS is based upon Generic Standards EN 50081-1 [1] and EN 50082-1 [2] and other standards where appropriate.

Transposition dates	
Date of adoption of this ETS:	22 December 1995
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## 1 Scope

This ETS covers the assessment of radiocommunications and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC). Technical specifications related to the antenna port and emissions for the enclosure port of radio equipment are found in the related product standards for the effective use of the radio spectrum.

This ETS specifies the applicable EMC tests, the test methods, the limits and the minimum performance criteria for Private land Mobile Radio (PMR) equipment (speech and/or non-speech) operating in the frequency range 30 - 1000 MHz, and the associated ancillary equipment.

The environmental classification used in this ETS refers to the environment classification used in the Generic Standards EN 50081-1 [1], EN 50082-1 [2], except for the vehicular environment class which refers to ISO 7637 [11].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at residential, commercial, light industrial and vehicular environments. The levels do not cover extreme cases which may occur in any location but have a low probability of occurrence.

This ETS may not cover those cases where a potential source of interference which is producing individually repeated transient phenomena or a continuous phenomena is permanently present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference or the interfered part or both.

Compliance of radio equipment to the requirements of this ETS does not signify compliance to any requirements related to the use of the equipment (i.e. licensing requirements).

Compliance to this ETS does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment that any observations regarding apparatus becoming dangerous or unsafe as a result of the application of the tests of this ETS, should be recorded in the test report.

## 2 Normative references

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This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and relate to the publications listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- |     |   |
|-----|---|
| [1] | EN 50081-1 (1992): "Electromagnetic compatibility - generic emission standard. Part 1: Residential, commercial and light industry". |
| [2] | EN 50082-1 (1992): "Electromagnetic compatibility - generic immunity standard. Part 1: Residential, commercial and light industry". |
| [3] | EN 55022 (1994): "Limits and methods of measurement of radio interference characteristics of information technology equipment".     |
| [4] | CISPR Publication No. 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods".                     |
| [5] | ENV 50140: "Basic immunity standard - Radiated, radio frequency, electromagnetic fields".   |
| [6] | IEC 801-2 (second edition 1991); Part 2: "Electrostatic discharge requirement".   |
| [7] | IEC 801-4 (1988); Part 4: "Electrical fast transients / burst requirements".  |
| [8] | ENV 50141: "Basic immunity standard - Conducted disturbances induced by radio-frequency fields".                                    |

- [9] IEC 1000-4-11: "Voltage dips, short interruptions and voltage variations. Immunity tests".
- [10] IEC 1000-4-5: "Surge immunity requirements".
- [11] ISO 7637 (1990): "Road vehicles-Electrical disturbance by conducting and coupling; Part 1: Passenger cars and light commercial vehicles with nominal 12 V supply voltage"; and "Part 2: Commercial vehicles with nominal 24 V supply voltage - Electrical transient conduction along supply lines only".

### 3 Definitions

For the purposes of this ETS, the following definitions apply:

**radiocommunications equipment:** An apparatus which includes one or more transmitters and/or receivers and/or parts thereof.

This type of equipment (apparatus) is used in a fixed, mobile or a portable application.

**ancillary equipment:** Equipment (apparatus), used in connection with a receiver, transmitter or transceiver is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a receiver, transmitter or transceiver to provide additional operational and/or control features to the radio equipment (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of a receiver, transmitter or transceiver; and
- the receiver, transmitter or transceiver 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.

**port:** A particular interface of the specified equipment (apparatus) with the external electromagnetic environment.

**enclosure port:** The physical boundary of the apparatus onto which an electromagnetic field may radiate or impinge.

**integral antenna:** An antenna designed to be connected directly to the equipment with or without the use of an external connector and considered to be part of the equipment. An integral antenna may be fitted internally or externally to the equipment.

### 4 General test conditions

This clause defines the general test configuration and is relevant for clauses 8 and 9.

#### 4.1 Test conditions and configurations

The equipment shall be tested under conditions which are within the manufacturer's declared range of humidity, temperature and supply voltage.

The test configuration shall be as close to normal intended use as possible.

Where portable (handheld) equipment is provided with a detachable integral antenna, it shall be tested with the antenna fitted in a manner typical of normal intended use, unless specified otherwise.

If the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports.

Ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the impedance of the ancillary equipment, RF input/output ports shall be correctly terminated.

If the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested.

Ports which are not connected to cables during normal intended operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables.

The tests shall be carried out at a point within the specified normal operating environmental range at the rated supply voltage for the equipment.

The test conditions, test configuration and mode of operation shall be recorded in the test report.

#### 4.1.1 Emission tests

This subclause defines the test conditions and configurations for the emission tests as follows:

- the measurement shall be made in the operation mode producing the largest emission in the frequency band being investigated consistent with normal applications;
- an attempt shall be made to maximise the detected radiated emission for example by moving the cables of the equipment.

#### 4.1.2 Immunity tests

This subclause defines the test conditions and configurations for the immunity tests as follows:

- the measurement shall be made in the mode of operation as required in subclause 4.1.2.1;
- for the immunity tests of ancillary equipment without separate pass/fail criteria, the receiver, transmitter or transceiver coupled to the ancillary equipment, shall be used to judge whether the ancillary equipment passes or fails.

##### 4.1.2.1 Mode of operation

For the immunity tests of transmitters, the transmitter shall be operated at its maximum rated output power, modulated with normal test modulation (subclauses 4.1.2.2 and 4.1.2.3). A communication link shall be established (subclause 4.1.2.4) at the start of the test and maintained during the test.

For the immunity tests of receivers, the wanted input signal, coupled to the receiver, shall be modulated with normal test modulation (subclauses 4.1.2.2 and 4.1.2.5). A communication link shall be established (subclause 4.1.2.6) at the start of the test and maintained during the test.

For the immunity tests of duplex transceivers, the EUT may be configured in the repeater mode, consistent with the conditions given above.

##### 4.1.2.2 Normal test modulation

For analogue speech equipment:

- the receiver wanted input signal shall be set to the nominal frequency of the receiver modulated with a sinusoidal audio frequency of 1 000 Hz to a deviation of 60 % peak system deviation for angle modulated equipment;
- the transmitter of the EUT shall be modulated with a sinusoidal audio frequency of 1 000 Hz at a deviation of 60 % peak system deviation for angle modulated equipment.