SLOVENSKI STANDARD
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Radijska oprema in sistemi (RES) - Standard elektromagnetne združljivosti (EMC) radiofrekvenčnih VHF FM radijskih oddajnikov

Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for VHF FM broadcasting transmitters

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Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for VHF FM broadcasting transmitters

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Foreword

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

This European Telecommunication Standard (ETS) has been prepared by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI) and the European Broadcasting Union (EBU)/ETSI Joint Technical Committee (JTC) in response to European Commission mandate BC-T-353.

This ETS, together with ETS 300 384, is intended to become a harmonized standard, the reference of which is intended to be published in the Official Journal of the European Communities referencing Council Directive 89/336/EEC (EMC Directive).

The technical characteristics which are relevant to the EMC Directive are listed in annex A.

Although all technical specifications that apply to the radiocommunications product on a "mandatory" basis to have it placed on the market and brought into use are included in this ETS and ETS 300 384, not all technical specifications have a similar status:

- compliance with the technical specifications, as referenced to the EMC Directive, allow the affixation of the CE mark and the free circulation of the radiocommunications product;

- the technical specifications referenced in the ERC Decision are for type approval purposes as part of the licensing provisions for bringing the equipment into use.

This latter subset of the technical specifications, although contained in the ETSs, is not harmonized under the terms of the EMC Directive, with the exception of those specifically referenced to the EMC Directive.

Other standards cover radio communications equipment not listed in the scope.

Transposition dates	
Date of adoption:	21 February 1997
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Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 December 1997
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1 Scope

This European Telecommunication Standard (ETS) covers the assessment of VHF FM sound broadcasting transmitters and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC). Technical specifications related to the antenna port are not included in this ETS. Such technical specifications are found in the related product standards for the effective use of the radio spectrum. This ETS specifies the applicable EMC tests, test methods, the limits and the minimum performance criteria for VHF FM sound broadcasting transmitters operating in the frequency range 87,5 MHz to 108 MHz, and any associated ancillary equipment.

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at broadcast transmitter site environments. The levels however do not cover extreme cases that may occur in any location but with a low probability of occurrence.

This ETS may not cover those cases where a potential source of interference that is producing individually repeated transient phenomena or a continuous phenomenon is permanently present, e.g. a radar or broadcast transmitter on the same site or 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 with the requirement related to the use of the equipment (licensing requirements).

Compliance to this ETS does not signify compliance to any safety requirement. However, it is the responsibility of the assessor of the equipment that any observation regarding the equipment 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

This standard 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 standard 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] IEC 244-1 and 1A (1968/1973/1989): "Methods of measurement for radio transmitters - Part 1: General conditions of measurement, frequency, output power and power consumption".

[4] ITU-R Recommendation 468-4 (1990): "Measurement of audio-frequency noise voltage level in sound broadcasting".

[5] EN 55022 (1994): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".

[6] EN 55011: "Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment".

[7] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".

[8] ENV 50140: "Electromagnetic compatibility - Basic immunity standard - Radiated, radio-frequency, electromagnetic field - Immunity test".

[9] EN 60801-2 (1993): "Electromagnetic compatibility for industrial-process measuring and control equipment - Part 2: Electrostatic discharge requirements".

[10] IEC 801-4 (1988): "Electromagnetic compatibility for industrial-process measuring and control equipment - Part 4: Electrical fast transient/burst requirements".

[11] ENV 50141: "Electromagnetic compatibility - Basic immunity standard - Conducted disturbances induced by radio-frequency fields - Immunity test".

[12] EN 61000-4-11: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests".

[13] IEC 1000-4-5: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity tests".

[14] IEC 244-13: "Methods of measurement for radio transmitters - Part 13: Performance characteristics for FM sound broadcasting".

3 Definitions and abbreviations

3.1 Definitions

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

ancillary equipment: Equipment (apparatus), used with a VHF FM sound broadcasting Transmitter , is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a VHF FM sound broadcasting Transmitter 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 VHF FM sound broadcasting Transmitter; and

- the VHF FM sound broadcasting Transmitter to which it is connected, is capable of providing some intended operation such as transmitting without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

dBqps: absolute weighted voltage level measured according to ITU-R Recommendation 468-4 [4] in sound-programme transmission.

manufacturer: The legal entity responsible for placing the product on the market.

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

switching range: The maximum frequency over which the VHF FM sound broadcasting Transmitter can be operated without change of components or re-alignment.

VHF FM Sound Broadcasting Transmitter (VHF/FM Tx): An active device that, when connected to an antenna, radiates a Frequency Modulated (FM) signal in the frequency band 87,5 MHz to 108 MHz. A VHF/FM Tx is intended to be used at a fixed location and therefore is defined as a fixed equipment. A VHF/FM Tx includes the following categories of equipment:

- a) transmitter: a VHF/FM Tx which consists a base-band fed FM modulator, (exciter), optionally followed by stages of Radio Frequency (RF) amplification. The baseband input may take the form of audio, multiplex, or a digitally-coded signal;

- b) transposer: a VHF/FM Tx which receives an input signal off-air, and re-broadcasts the same signal on a different frequency;

- c) active deflector: a VHF/FM Tx which receives an input signal off-air, and re-broadcasts the same signal on the same frequency;

- d) RF power amplifier: a VHF/FM Tx which comprises an amplifier declared by the manufacturer to be capable of being connected to a radiating antenna system.

3.2 Abbreviations

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

EMC	ElectroMagnetic Compatibility
EUT	Equipment under Test
FM	Frequency Modulation
ISM	Industrial, Scientific And Medical
LISN	Line Impedance Stabilizing Network
RDS	Radio Data System
RF	Radio Frequency
rms	root mean squared
Tx	Transmitter
VHF	Very High Frequency

4 General test conditions

4.1 Test conditions

The equipment shall be tested under normal test conditions contained in the relevant product and basic standards or in the information accompanying the equipment, which are within the manufacturer's declared range of humidity, temperature and supply voltage.

The test conditions shall be in accordance with IEC 244-1 [3] unless otherwise stated, and shall be recorded in the test report.

The test configuration shall be as close to normal intended use as possible and shall be recorded in the test report.

For immunity tests, the output of the VHF/FM Tx shall be monitored as specified in this ETS, subclauses 4.2, 4.3, 4.4, 4.5 and 4.6 shall apply and the conditions shall be as follows:

- the VHF/FM Tx shall be operated at its declared normal maximum output power modulated with a suitable test signal (see subclause 4.2);

- for transposers, RF power amplifiers and active deflectors the wanted RF input signal shall be coupled to the RF input port.

4.2 Arrangements for test signals at the input of the VHF/FM Tx

Any unused baseband input ports shall be terminated according to the manufacturer's instructions.

For the purpose of these tests, no audio modulation is applied to the VHF/FM Tx (quiet channel).

If a VHF/FM Tx incorporates baseband processing and/or coding equipment (e.g. stereo encoder, limiter, Radio Data System (RDS) encoder), this equipment shall be active as in normal operation.

In the case of transposers and active deflectors, the wanted RF input signal shall be set to a level of -27 dBm, and at a frequency determined from the manufacturers' specifications.

In the case of RF power amplifiers, the input shall be delivered from an external exciter provided by the manufacturer. The exciter shall be placed outside the test environment.