

**SLOVENSKI STANDARD**  
**SIST EN 301 489-14 V1.1.1:2003**  
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**Elektromagnetna združljivost (EMC) in zadeve v zvezi z radijskim spektrom (ERM) - Standard elektromagnetne združljivosti (EMC) za radijsko opremo in storitve - 14. del: Posebni pogoji za oddajnike v storitvi analogne in digitalne prizemne televizijske radiodifuzije**

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters

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# ETSI EN 301 489-14 V1.1.1 (2002-05)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
ElectroMagnetic Compatibility (EMC) standard  
for radio equipment and services;  
Part 14: Specific conditions for analogue  
and digital terrestrial TV broadcasting service transmitters**

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document, together with EN 301 489-1 [1], is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility ("the EMC Directive") (89/336/EEC [2] as amended) and Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive" [3]).

The present document is part 14 of a multi-part deliverable covering Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services, as identified below:

- Part 1: "Common technical requirements";
- Part 2: "Specific conditions for radio paging equipment";
- Part 3: "Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz";
- Part 4: "Specific conditions for fixed radio links and ancillary equipment and services";
- Part 5: "Specific conditions for Private land Mobile Radio (PMR) and ancillary equipment (speech and non-speech)";
- Part 6: "Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment";
- Part 7: "Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)";
- Part 8: "Specific conditions for GSM base stations";
- Part 9: "Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices";
- Part 10: "Specific conditions for First (CT1 and CT1+) and Second Generation Cordless Telephone (CT2) equipment";
- Part 11: "Specific conditions for analogue terrestrial sound broadcasting (Amplitude Modulation (AM) and Frequency Modulation (FM)) service transmitters";
- Part 12: "Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in the Fixed Satellite Service (FSS)";

- Part 13: "Specific conditions for Citizens' Band (CB) radio and ancillary equipment (speech and non-speech)";
- Part 14: "Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters";**
- Part 15: "Specific conditions for commercially available amateur radio equipment";
- Part 16: "Specific conditions for analogue cellular radio communications equipment, mobile and portable";
- Part 17: "Specific conditions for Wideband data and HIPERLAN equipment";
- Part 18: "Specific conditions for Terrestrial Trunked Radio (TETRA) equipment";
- Part 19: "Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications";
- Part 20: "Specific conditions for Mobile Earth Stations (MES) used in the Mobile Satellite Services (MSS)";
- Part 22: "Specific conditions for ground based VHF aeronautical mobile and fixed radio equipment";
- Part 23: "Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) Base Station (BS) radio, repeater and ancillary equipment";
- Part 24: "Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile and portable (UE) radio and ancillary equipment";
- Part 25: "Specific conditions for IMT-2000 CDMA Multi-carrier Mobile Stations and ancillary equipment";
- Part 26: "Specific conditions for IMT-2000 CDMA Multi-carrier Base Stations and ancillary equipment".

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### National transposition dates (standards.iteh.ai)

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Date of latest publication of new National Standard or endorsement of this EN (dop/e):	28 February 2003
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# 1 Scope

The present document, together with EN 301 489-1 [1], covers the assessment of analogue and digital transmitters, exciters, and any associated ancillary equipment dedicated for television broadcasting services, in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port emissions and cabinet radiation are not included in the present document. Such technical specifications are found in the relevant product standards of ETSI for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for analogue and digital terrestrial television broadcasting transmitters and their associated ancillary equipment.

Definitions of the type of broadcast transmitters and exciters covered by the present document are given in annex A.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and EN 301 489-1 [1], the provisions of the present document take precedence.

The environmental classification and the emission and immunity requirements used in the present document are as stated in EN 301 489-1 [1], except for any specific conditions included in the present document, under which broadcast service transmitters are typically used.

The present document 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 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.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- SIST EN 301 489-14 V1.1.1:2003  
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- [1] ETSI EN 301 489-1 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".
- [2] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.
- [3] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
- [4] ITU-R Recommendation BT.500-9: "Methodology for the subjective assessment of the quality of television pictures".
- [5] EN 55011 (1998): "Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement".
- [6] ETSI EN 300 744 (V1.4.1): "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television".
- [7] EN 61000-4-3 1996/A1: 1998: "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".



## 3 Definitions and abbreviations

### 3.1 Definitions

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

**broadcasting service:** radiocommunication service in which the transmissions are intended for direct reception by the general public

NOTE: This service may include sound transmission, television transmission, or other types of transmission.

**transposer:** Tx/Rx (transceiver), which receives an input signal off-air, and re-broadcasts the same signal on a different frequency

**active deflector:** Tx/Rx (transceiver, repeater, gap filler), which receives an input signal off-air, and re-broadcasts the same signal on the same frequency

**RF power amplifier:** Tx, which comprises an amplifier, declared by the manufacturer to be capable of being connected to a terrestrial broadcasting antenna system

**exciter:** low level RF power driver stage of a broadcasting transmitter

### 3.2 Abbreviations

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

AC	Alternating Current
AM	Amplitude Modulation
BER	Bit Error Ratio
CISPR	International Special Committee on Radio Interference (in IEC)
CT	Continuous phenomena applied to Transmitters
DC	Direct Current
DQPSK	Differential Quaternary Phase-Shift Keying
DVB	Digital Video Broadcasting
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
FM	Frequency Modulation
IF	Intermediate Frequency
IRT	Institute für Rundfunktechnik
MER	Modulation Error Ratio
MPEG	Moving Picture Experts Group
NICAM	Near-Instantaneous Companded Audio Multiplex
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
rms	root mean square
Rx	Receiver
SNR	Signal to Noise Ratio
T-DVB	Terrestrial Digital Video Broadcasting
TS	Transport Stream
TT	Transient phenomena applied to Transmitters
TV	TeleVision
Tx	Transmitter
UHF	Ultra High Frequency
VHF	Very High Frequency

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## 4 Test conditions

For the purposes of the present document, the test conditions of EN 301 489-1 [1], clause 4 shall apply as appropriate. Further provisions related to test conditions for broadcasting service transmitters are specified in the present document.

### 4.1 General

For emission and immunity tests the test modulation, test arrangements, etc. as specified in the present document, clauses 4.1 to 4.5 shall apply.

For immunity tests, the output of the Tx shall be monitored as specified in the present document, clause 4.2.3.

### 4.2 Arrangements for test signals

The provisions of EN 301 489-1 [1], clause 4.2 shall apply.

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

The provisions of EN 301 489-1 [1], clause 4.2.1 shall apply, with the following modifications:

- If the transmitter under test incorporates base-band processing and/or coding equipment (e.g. a NICAM encoder for an analogue modulated TV transmitter, or an MPEG2 encoder for a digital television transmitter), then this equipment shall be active as in normal operation. The manufacturer shall provide reference encoders and the tests shall be carried out with these in operational mode.
- If the transmitter under test does not include integrated base-band processing and/or coding equipment, the manufacturer shall declare whether the transmitter is designed for operation with or without encoder(s). The manufacturer shall clearly state this in the product documentation.
- If the transmitter under test is designed for operation with externally fitted encoder(s), then it is left to the decision of the manufacturer whether the transmitter under test shall be tested with such encoder(s). Depending on the manufacturer's decision, the manufacturer may have to provide reference encoders and the tests shall be carried out with these in operational mode.

Any unused input port of the transmitter under test shall be terminated according to the manufacturer's instructions.

#### 4.2.2 Arrangements for test signals at the input of transposers, active deflectors, or RF power amplifiers

The provisions of EN 301 489-1 [1], clause 4.2.1 shall apply, with the following modifications:

- In case of transposers and active deflectors, the wanted RF input signal, at a frequency determined from the manufacturer's specification, shall be set to a level equal to the mid point of the range declared by the manufacturer.
- In case of RF amplifiers, the wanted RF input signal of a suitable level shall be delivered from an adequate external modulator provided by the manufacturer. The modulator may be placed outside the test environment.
- A broadcasting transmission shall be established at the start of the test and maintained during the test.

### 4.2.3 Arrangements for test signals at the output of transmitters, transposers, active deflectors or RF power amplifiers

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

Typical test arrangements to assess the performance of the EUT are shown in:

- figure 1 for analogue modulated TV transmitters;
- figure 2 for T-DVB transmitters.

NOTE: In practice it is not necessary to use all the individual instrumentation shown in figure 1. For specific measurement requirements refer to table 1.

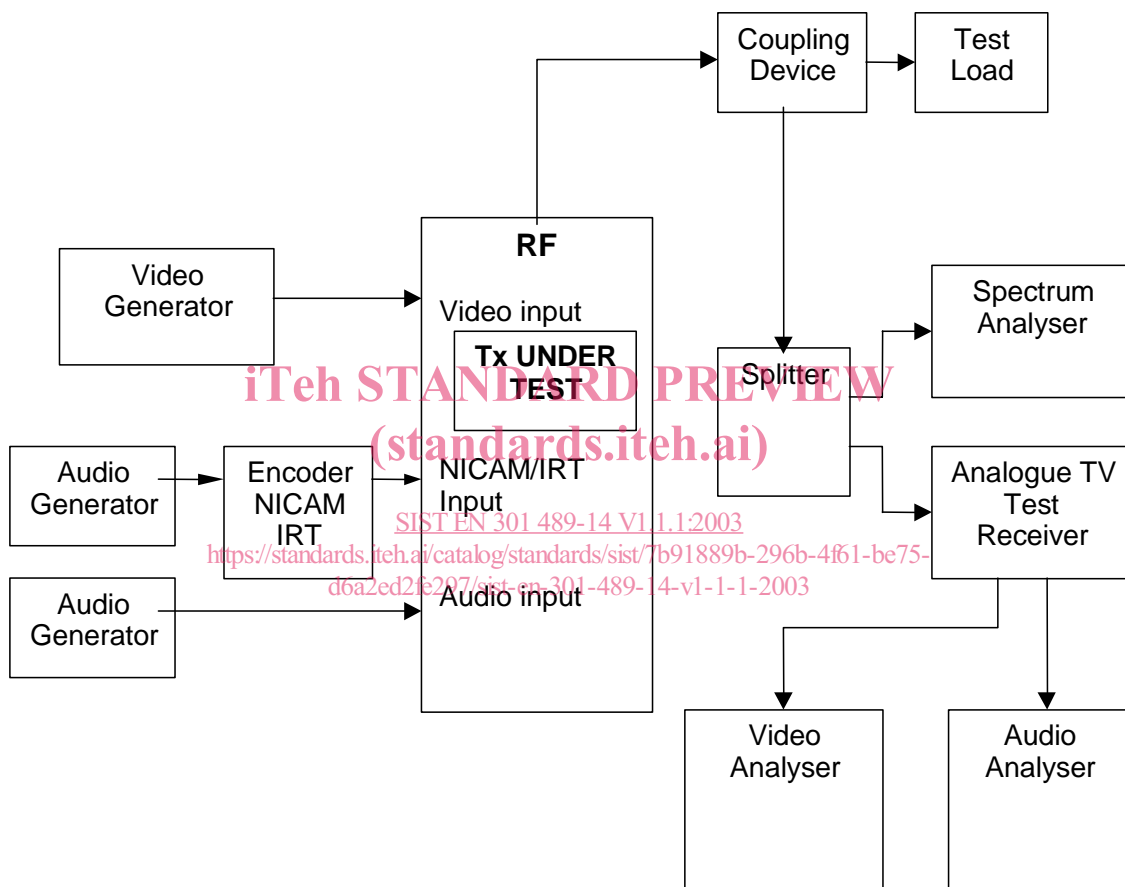


Figure 1: Typical test arrangement for the performance assessment of a standard analogue modulated TV transmitter, example