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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**



Reference

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Contents

Intellectual Property Rights	4
Foreword.....	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	6
3.1 Definitions	6
3.2 Abbreviations	6
4 Test conditions	7
4.1 General	7
4.2 Arrangements for test signals	7
4.2.1 Arrangements for test signals at the input of transmitters.....	7
4.2.2 Arrangements for test signals at the input of transposers, active deflectors, or RF power amplifiers	7
4.2.3 Arrangements for test signals at the output of transmitters, transposers, active deflectors or RF power amplifiers	8
4.3 RF exclusion bands	9
4.3.1 Transmitter and RF power amplifier exclusion band.....	9
4.3.2 Active deflector exclusion band.....	9
4.3.3 Transposer exclusion band.....	9
4.4 Narrow band responses of receivers	10
4.5 Normal test modulation	10
4.5.1 Analogue Modulation	10
4.5.2 Digital Modulation (T-DVB).....	10
5 Performance assessment.....	10
5.1 General	10
5.2 Equipment which can provide a continuous communication link as a broadcasting transmission.....	10
5.3 Equipment which does not provide a continuous communication link as a broadcasting transmission.....	10
5.4 Ancillary equipment	11
5.5 Equipment classification	11
6 Performance criteria	11
6.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)	11
6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)	12
7 Applicability overview	12
7.1 Emission.....	12
7.1.1 General.....	12
7.1.2 Special conditions.....	12
7.2 Immunity	13
7.2.1 General.....	13
7.2.2 Special conditions.....	13
Annex A (informative): Types of broadcasting service equipment covered by the present document	15
A.1 Analogue television.....	15
A.2 Digital television	15
Annex B (informative): Bibliography.....	16
Annex C (informative): The EN title in the official languages	17
History	18

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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), and is now submitted for the ETSI standards One-step Approval Procedure.

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 [3] 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. Full details of the entire series can be found in part 1 [1].

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):	36 months after doa

1 Scope

The present document, together with EN 301 489-1 [1], covers the assessment of analogue and digital transmitters, excitors, 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 excitors 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.

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.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] ETSI EN 301 489-1 "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 (EMC Directive).
- [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 (R&TTE Directive).
- [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:

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

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.

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

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

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

3.2 Abbreviations

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

AC	Alternating Current
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
IF	Intermediate Frequency
IRT	Institut 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

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.

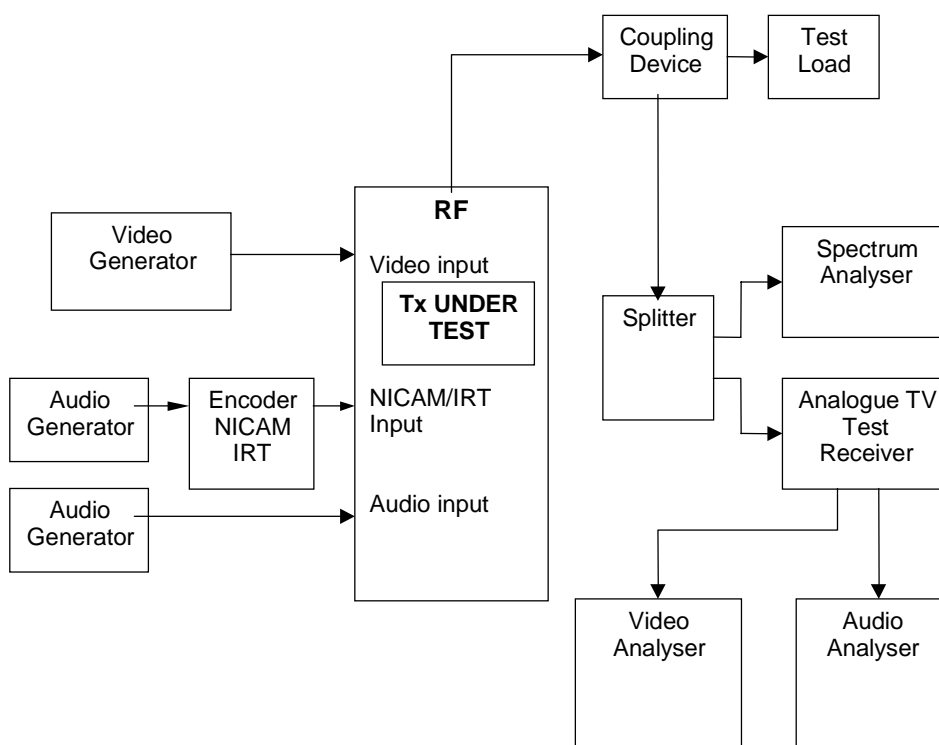


Figure 1: Typical test arrangement for the performance assessment of a standard analogue modulated TV transmitter, example

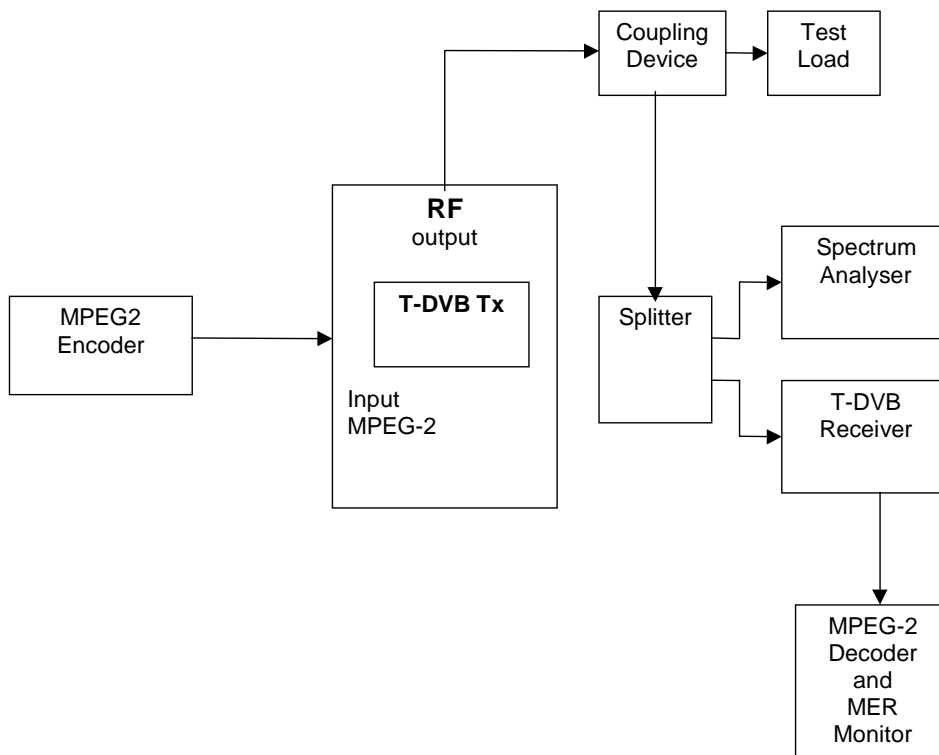


Figure 2: Typical test arrangement for the performance assessment of a T-DVB transmitter, example

4.3 RF exclusion bands

The provisions of EN 301 489-1 [1], clause 4.3 shall apply with the modifications set out in clauses 4.3.1, 4.3.2 and 4.3.3 of the present document.

4.3.1 Transmitter and RF power amplifier exclusion band

The exclusion band for the transmitter and/or power amplifier shall be the allocated channel.

4.3.2 Active deflector exclusion band

The exclusion band for the active deflector (transmitting and receiving elements) is equal to the channel centre frequency -5 % to +5 %.

Special precautions shall be taken to avoid the wanted RF output of the active deflector from disturbing the signal at the RF input port.

4.3.3 Transposer exclusion band

For emission measurements, the transposer exclusion band shall comprise the exclusion band of the transmitting element of the equipment under test only.

For immunity tests with continuous phenomena, the transposer exclusion bands shall comprise both the exclusion bands of the transmitting and receiving elements of the equipment under test.

The exclusion band for the transposer (transmitting and receiving elements) is equal to the channel centre frequency for each element -5 % to +5 %.

For the receiver part of the transposer, the exclusion band takes into account the blocking effect that may occur due to the high level of the immunity test fieldstrength (10 V/m) in regard to the RF input level of that receiver part (which is usually less than 1 mV).

4.4 Narrow band responses of receivers

The provisions of EN 301 489-1 [1], clause 4.4 shall apply during the immunity tests of transposers and active deflectors to continuous phenomena.

4.5 Normal test modulation

4.5.1 Analogue Modulation

The vision carrier shall be amplitude modulated with composite sync pulses and a 350 mV luminance bar, the sound 1 (mono) carrier shall be frequency modulated with a 1 kHz sinusoidal signal at a level to cause a frequency deviation of 50 kHz and the sound 2 (NICAM) carrier shall be DQPSK modulated with a pseudo random bit sequence.

4.5.2 Digital Modulation (T-DVB)

The modulation signal at the input of the transmitter shall be as stated in EN 300 744 [6], clause 4.3, but with the following specific settings:

- Mode 8K;
- Guard interval duration 1/32;
- TS modulation 64 QAM;
- Code Ratio 2/3.

5 Performance assessment

5.1 General

The provisions of EN 301 489-1 [1], clause 5.1 shall apply. In addition, the manufacturer shall, at the time of submission of the equipment for testing, declare the following information, also to be recorded in the test report, as appropriate:

- the frequencies as used in the transmitter for oscillators, clocks and intermediate frequencies;
- the bandwidth of the IF filter, or the bandwidth of the RF filter if no IF signal processing is used;
- for RF amplifiers, the nominal level of the wanted RF input signal to be used for the EMC tests.

For transmitters supplied for testing, which do 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), for inclusion in the product documentation. The manufacturer shall declare whether the EMC tests shall be performed with external encoder(s) fitted to the transmitter.

5.2 Equipment which can provide a continuous communication link as a broadcasting transmission

The provisions of EN 301 489-1 [1], clause 5.2 shall apply.

5.3 Equipment which does not provide a continuous communication link as a broadcasting transmission

Not applicable.

5.4 Ancillary equipment

The provisions of EN 301 489-1 [1], clause 5.4 shall apply.

5.5 Equipment classification

Unless specified otherwise in clause 7.1.2 and/or clause 7.2.2 of the present document, broadcast service transmitters and associated ancillary equipment in the scope of the present document shall meet the requirements for base station and ancillary equipment set out in EN 301 489-1 [1], clauses 7, 8 and 9.

6 Performance criteria

The provisions of EN 301 489-1 [1], clause 6 shall apply.

6.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)

The provisions of EN 301 489-1 [1], clause 6.1 shall apply with the following modifications.

A broadcasting transmission link shall be established between the EUT and the monitoring equipment at the start of the test, and maintained during the test.

The parameters specified in table 1 shall be used to assess the performance of the Tx under test for continuous phenomena. During each individual exposure in the test sequence, it shall be verified that the characteristics of the wanted output signals remain within the permitted value ranges listed in table 1.

The performance of the Tx under test shall be assessed during the exposure with error correction activated and/or pre-emphasis and de-emphasis inserted into the transmission line, if appropriate.

Table 1: Performance criteria for continuous phenomena

Type of Equipment	Parameters	Values measured during pre-tests	Permitted values during immunity tests
analogue modulated TV equipment of any system's standard (B, G, I, K1, L)	RF power variation RF frequency variation Video SNR Audio SNR BER from NICAM Picture subjective quality and sound subjective quality for source: NICAM	RF power RF frequency Manufacturer's declared; Video SNR Audio SNR $\leq 10^{-6}$ Q5 (see note 1)	RF power $\pm 5\%$ RF frequency (sound and vision) ± 500 Hz Manufacturer's declared minimum audio and video SNR; $\leq 10^{-5}$ Q5 (see note 1)
T-DVB equipment	MER Picture and sound subjective quality (see note 2)	Manufacturer's declared; MER Q5 (see notes 1 and 2)	Manufacturer's declared minimum MER Q5 (see notes 1 and 2)
NOTE 1: According to: - ITU-R Recommendation BT.500-9 [4]; - the subjective assessment of the picture quality may be carried out directly by the operator. NOTE 2: The subjective assessment of the picture quality may be carried out with an MPEG-2 picture quality analyser, or directly by the operator.			

During the test the readings of the parameters monitored by the test instrumentation shall remain within the permitted value ranges during the immunity tests, specified in table 1.

At the conclusion of the total test, the EUT shall operate as intended, with no loss of control functions or stored data, as declared by the manufacturer, and the broadcasting transmission link shall have been maintained. The readings of the parameters monitored by the test instrumentation shall regain their reference values measured during the pre-test.

No false alarms or abnormal commands shall be generated as a result of the electromagnetic stress. Alarms indicating well-defined incidents due to the electromagnetic stress affecting the general performance of the transmitter under test may however occur. It shall be possible to reset these alarms by manual operation of controls.

Where the EUT provides a stand-by mode, the exposure shall be repeated in this mode to ensure that no unintentional transmission occurs.

6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)

The provisions of EN 301 489-1 [1], clause 6.2 shall apply with the following modifications.

A broadcasting transmission link shall be established between the EUT and the monitoring equipment at the start of the test.

During the tests, no assessment of the actual performance applies.

The broadcasting transmission link shall be automatically regained at the conclusion of each individual test exposure.

At the conclusion of the total test, the EUT shall operate as intended, with no loss of control functions or stored data, as declared by the manufacturer, and the broadcasting transmission link shall have been maintained, or regained. The readings of the parameters monitored by the test instrumentation shall regain their nominal values measured during the pre-test.

No false alarms or abnormal commands shall be generated as a result of the electromagnetic stress. Alarms indicating well-defined incidents due to the electromagnetic stress temporarily affecting the general performance of the transmitter under test may however occur. It shall be possible to reset these alarms by manual operation of controls.

Where the EUT provides a stand-by mode, the test shall be repeated in this mode to ensure that no unintentional transmission occurs.

7 Applicability overview

7.1 Emission

7.1.1 General

Table 2 in EN 301 489-1 [1] contains the applicability of emission measurements to the relevant ports of radio and/or associated ancillary equipment.

Table 2 in EN 301 489-1 [1] shall apply.

7.1.2 Special conditions

The following special conditions set out in table 2 of the present document relate to the method of measurement and limits for EMC emissions used in EN 301 489-1 [1], clause 8.

Table 2: Special conditions for EMC emission measurements

Reference to clauses in EN 301 489-1 [1]		Special product-related conditions, additional to or modifying the test conditions and limits in EN 301 489-1 [1]			
8.3.2	Test method; DC power input/output ports, and	For ports of transmitters drawing a power of greater than 200 W (DC) and greater than 200 VA (AC) respectively, the test method shall be in accordance with EN 55011 [5].			
8.4.2	Test method; AC mains power input/output ports				
8.3.3 Limits; DC power input/output ports and 8.4.3 Limits; AC mains power input/output ports		For ports of transmitters drawing a power of less than or equal to 200 W (DC) and less than or equal to 200 VA (AC) respectively, the emission limits specified in EN 301 489-1 [1] clauses 8.3.3 and 8.4.3 shall be applied as appropriate. For transmitters drawing a DC power greater than 200 W or AC mains power of greater than 200 VA the following limits shall be applied. Limits for conducted emissions on AC and DC ports of transmitters.			
		AC Power (kVA) DC Power (kW)	Limits (dB μ V)		Frequency range (MHz)
			Quasi-peak	Average	
		> 0,2 to 2	79 73	66 60	0,15 to 0,5 > 0,5 to 30
		> 2 to 10	89 83	76 70	0,15 to 0,5 > 0,5 to 30
		> 10 to 75	100 86 90 to 70 (see note 1)	90 76 80 to 60 (see note 1)	0,15 to 0,5 > 0,5 to 5 5 to 30
> 75	130 (see note 2) 125 (see note 2) 115 (see note 2)	120 (see note 2) 115 (see note 2) 105 (see note 2)	0,15 to 0,5 > 0,5 to 5 5 to 30		
NOTE 1: Limits decreasing linearly with the logarithm of frequency.					
NOTE 2: Measured with CISPR voltage probe, see EN 55011 [5], figure 4.					

7.2 Immunity

7.2.1 General

Table 3 in EN 301 489-1 [1] contains the applicability of immunity measurements to the relevant ports of transmitters and/or associated ancillary equipment.

Table 3 in EN 301 489-1 [1] shall apply with the test signal levels set out in the present document.

7.2.2 Special conditions

The following special conditions set out in table 3 relate to the immunity test methods and levels used in EN 301 489-1 [1], clause 9.

Table 3: Special conditions for EMC immunity tests

Reference to clauses in EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions and limits in EN 301 489-1 [1]
9.2.2 Test method; Radio frequency electromagnetic field	The test method is described in EN 61000-4-3 [7]. The level of the immunity RF test signal shall be 10V/m. Immunity tests with radiated RF fields need not be carried out under the following conditions: 1) Where for AC powered equipment, the input current exceeds 16 A per phase (at 230 V), or the RF output power is greater than 5 kW, 2) Where for DC powered equipment the input power exceeds 2 kW.
9.4.2 Test method; Fast transients, common mode	The following immunity test levels shall be applied: - on AC mains power input ports: ± 2 kV; - on DC power input, modulation input, and data cable ports: ± 1 kV, only if intended for connection to cables longer than 3 m. If the current consumption of the transmitter exceeds the capability of the test equipment then where possible sensitive electronics (exciters, etc.) may be tested separately.
9.5.2 Test method; RF common mode	The level of the immunity RF test signal shall be 10 V rms. Transmitters not being tested to radio frequency electromagnetic fields according to row 9.2.2 of this table shall be tested to conducted common mode RF. In this case the conducted RF immunity test described in EN 301 489-1 [1], clause 9.5 shall be used only, with the test frequency range extended up to 230 MHz and the test level set to 10 V rms.
9.7 Voltage dips and interruptions	If the current consumption of the transmitter exceeds the capability of the test equipment then where possible sensitive electronics (exciters, etc.) may be tested separately.
9.8 Surges	If the current consumption of the transmitter exceeds the capability of the test equipment then where possible sensitive electronics (exciters, etc.) may be tested separately.
9.8.2 Test method; Surges	The following immunity test levels and performance criteria shall be applied: AC mains power input ports: - line to line mode: ± 1 kV; - line to ground mode: ± 2 kV. If the current consumption of the transmitter exceeds the capability of the test equipment then where possible sensitive electronics (exciters, etc.) may be tested separately. Telecommunication ports: - line to ground mode ± 2 kV.

Annex A (informative): Types of broadcasting service equipment covered by the present document

A.1 Analogue television

System B analogue TV transmitters operating in the frequency range 174 MHz to 230 MHz.

System B analogue TV active deflector operating in the frequency range 174 MHz to 230 MHz.

System B analogue TV transposer operating in the frequency range 174 MHz to 230 MHz.

System G, I, K1 and L analogue TV transmitters operating in the frequency range 470 MHz to 860 MHz.

System G, I, K1 and L analogue TV active deflector operating in the frequency range 470 MHz to 860 MHz.

System G, I, K1 and L analogue TV transposer operating in the frequency range 470 MHz to 860 MHz.

A.2 Digital television

T-DVB TV transmitters operating in the frequency range 174 MHz to 230 MHz.

T-DVB TV active deflector operating in the frequency range 174 MHz to 230 MHz.

T-DVB TV transposer operating in the frequency range 174 MHz to 230 MHz.

T-DVB TV transmitters operating in the frequency range 470 MHz to 860 MHz.

T-DVB TV active deflectors operating in the frequency range 470 MHz to 860 MHz.

T-DVB TV transposer operating in the frequency range 470 MHz to 860 MHz.

Annex B (informative): Bibliography

- The Chester 1997 Multilateral Coordination Agreement relating to Technical Criteria, Coordination Principles and Procedures for the introduction of Terrestrial Digital Video Broadcasting (DVB-T), Chester, 25 July 1997.
- ETSI ETR 290 (1997): "Digital Video Broadcasting (DVB); Measurement guidelines for DVB systems".
- ITU-T Recommendation O.151: "Error performance measuring equipment operating at the primary rate and above".
- ITU-R Recommendation BT.1368-1: "Planning criteria for digital terrestrial television services in the VHF/UHF bands".
- EN 60244-1 (1999): "Methods of measurement for radio transmitters - Part 1: General characteristics for broadcast transmitters".
- EN 60244-5 (1992): "Methods of measurement for radio transmitters - Part 5: Performance characteristics of television transmitters".
- ITU-R Recommendation BT.470-6: "Conventional television systems".
- ITU-R Recommendation BS 1116-1: "Methods for the subjective assessment of small impairments in audio systems including multichannel sound systems".
- ETSI ETR 273-4 (1998): "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 4: Open area test site".
- Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

Annex C (informative): The EN title in the official languages

Language	EN title
Danish	Elektromagnetisk kompatibilitet og radiospektrum-anliggende (ERM); Elektromagnetisk kompatibilitet (EMC) for radioudstyr og tjenester; Del 14: Særlige krav til analoge og digitale jordbaserede TV sendestationer
Dutch	Elektromagnetische compatibiliteit en radiospectrumzaken (ERM); Elektromagnetische compatibiliteitsnorm (EMC) voor radioapparatuur en radiodiensten; Deel 14: Specifieke voorwaarden voor analoge en digitale terrestrische TV-omroepzender
English	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
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM), sähkömagneettinen yhteensopivuusstandardi radiolaitteille ja järjestelmille; Osa 14: Erityisehdot maanpäällisen televisiotoiminnan analogisille ja digitaalisille lähettimille
French	CEM et spectre radioélectrique (ERM); Compatibilité électromagnétique pour les équipements de communication radio et services; Partie 14: Conditions particulières pour les émetteurs analogiques et numériques du service de radiodiffusion de télévision terrestre
German	Elektromagnetische Verträglichkeit und Funkspektrumsangelegenheiten (ERM); Elektromagnetische Verträglichkeit für Funkeinrichtungen und -dienste; Teil 14: Spezifische Bedingungen für analoge und digitale Sender für den terrestrischen Fernseh Rundfunkdienst
Greek	Ηλεκτρο μαγνητική συμβατότητα και θέματα ραδιοφάσματος (ERM); Πρότυπο ηλεκτρο μαγνητικής συμβατότητας (EMC) για ραδιοσυσκευές και ραδιοπηρεσίες; Μέρος 14: Είδικες συνθήκες για επίγειους αναλογικούς και ψηφιακούς πομπούς (υπηρεσίας) τηλεόρασης
Italian	Compatibilità elettromagnetica e Questioni relative allo spettro delle radiofrequenze (ERM); Norma di Compatibilità elettromagnetica (EMC) per apparecchiature e servizi radio; Parte 14: Condizioni specifiche per trasmettitori del servizio di radiodiffusione televisiva analogica e digitale terrestre
Portuguese	Assuntos de espectro radioelétrico e compatibilidade electromagnética (ERM); norma de compatibilidade electromagnética (EMC) para equipamento de rádio e serviços; parte 14: condições específicas para transmissores do serviço terrestre de televisão analógica e digital
Spanish	Compatibilidad electromagnética y cuestiones de espectro de radiofrecuencia (ERM); Compatibilidad electromagnética (EMC) estándar para equipos radio y servicios; Parte 14: Condiciones particulares para transmisores del servicio de radiodifusión televisiva terrestre; analógica y digital
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Elektromagnetisk kompatibilitetsstandard (EMC) för radioutrustning och tjänster; Del 14: Specifika villkor för analoga och terrestra TV-sändare för rundradiotjänst

History

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