

# Sound and television broadcast receivers and associated equipment — Radio disturbance characteristics — Limits and methods of measurement

ICS 33.100.10

# National foreword

This British Standard is the UK implementation of EN 55013:2001+A2:2006. It was derived by CENELEC from CISPR 13:2001, incorporating amendments 1:2003 and 2:2006. It supersedes BS EN 55013:2001 which is withdrawn.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags [C] <C].

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] <A1]. Tags indicating changes to CENELEC text carry the number of the CENELEC amendment. For example, text altered by CENELEC amendment 1 is indicated by [A1] <A1].

National Annex ZA (informative) reproduces CENELEC interpretation sheet 1 (June 2009).

The UK participation in its preparation was entrusted by Technical Committee GEL/210, EMC — Policy committee, to Subcommittee GEL/210/11, EMC Product standards.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

## Amendments/corrigenda issued since publication

This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 03 December 2001

© BSI 2010

ISBN 978 0 580 65870 9

| Amd. No.                             | Date              | Comments                                                                    |
|--------------------------------------|-------------------|-----------------------------------------------------------------------------|
| 13656<br>Incorp.<br>corrigendum No.1 | 15 January 2002   | Correction to Table 5 and copyrights                                        |
| 14680                                | 30 September 2003 | Implementation of CISPR amendment 1:2003 with CENELEC endorsement A1:2003   |
| 16532                                | 29 September 2006 | Implementation of CISPR amendment 2:2006 with CENELEC endorsement A2:2006   |
|                                      | 28 February 2010  | Addition of CENELEC interpretation sheet 1 (June 2009) in National Annex NA |

**Sound and television broadcast receivers  
and associated equipment -  
Radio disturbance characteristics -  
Limits and methods of measurement  
(CISPR 13:2001, modified)**

Récepteurs de radiodiffusion et de  
télévision et équipements associés -  
Caractéristiques des perturbations  
radioélectriques -  
Limites et méthodes de mesure  
(CISPR 13:2001, modifiée)

Ton- und Fernseh-Rundfunkempfänger  
und verwandte Geräte der  
Unterhaltungselektronik -  
Funkstöreigenschaften -  
Grenzwerte und Messverfahren  
(CISPR 13:2001, modifiziert)

This European Standard was approved by CENELEC on 2001-09-01; amendment A1 was approved by CENELEC on 2003-04-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

### Foreword

The text of document CISPR/E/213/FDIS, future edition 4 of CISPR 13, prepared by CISPR SC E, Interference relating to radio receivers, was submitted to the IEC-CENELEC parallel vote. Together with a common modification prepared by SC 210A, EMC Products, of Technical Committee CENELEC TC 210, Electromagnetic compatibility (EMC), it was approved by CENELEC as EN 55013 on 2001-09-01.

This European Standard supersedes EN 55013:1990 + A12:1994 + A13:1996 + A14:1999.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2002-06-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2004-09-01

Annexes designated "normative" are part of the body of the standard.  
In this standard, annex ZA is normative.  
Annex ZA has been added by CENELEC.

---

### Endorsement notice

The text of the International Standard CISPR 13:2001 was approved by CENELEC as a European Standard with agreed common modifications.

### Foreword to amendment A1

The text of document CISPR/I/58/FDIS, future amendment 1 to CISPR 13:2001, prepared by CISPR SC I, Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 55013:2001 on 2003-04-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2004-01-01
- latest date by which the national standards conflicting  
with the amendment have to be withdrawn (dow) 2006-04-01

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annex A is normative and annex B is informative.

---

### Endorsement notice

The text of amendment 1:2003 to the International Standard CISPR 13:2001 was approved by CENELEC as an amendment to the European Standard without any modification.

**Foreword to amendment A2**

The text of document CISPR/I/177/FDIS, future amendment 2 to CISPR 13:2001, prepared by CISPR SC I, Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 55013:2001 on 2006-03-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2006-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2009-03-01

This European Standard makes reference to International Standards. Where the International Standard referred to has been endorsed as a European Standard or a home-grown European Standard exists, this European Standard shall be applied instead. Pertinent information can be found on the CENELEC web site.

---

**Endorsement notice**

The text of amendment 2:2006 to the International Standard CISPR 13:2001 was approved by CENELEC as an amendment to the European Standard without any modification.

---

## CONTENTS

|                                                                                                                                                                               |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| INTRODUCTION .....                                                                                                                                                            | 7  |
| 1 Scope and object .....                                                                                                                                                      | 8  |
| 2 Normative references .....                                                                                                                                                  | 8  |
| 3 Definitions and abbreviations .....                                                                                                                                         | 9  |
| 3.1 Definitions .....                                                                                                                                                         | 9  |
| 3.2 Abbreviations .....                                                                                                                                                       | 10 |
| 4 Limits of disturbance .....                                                                                                                                                 | 10 |
| 4.1 General .....                                                                                                                                                             | 10 |
| 4.2 Disturbance voltage at the mains terminals .....                                                                                                                          | 11 |
| 4.3 Disturbance voltage at the antenna terminals .....                                                                                                                        | 11 |
| 4.4 Wanted signal and disturbance voltage at the RF output of equipment with<br>incorporated or with add-on RF video modulator .....                                          | 12 |
| 4.5 Disturbance power .....                                                                                                                                                   | 13 |
| 4.6 Radiated disturbances .....                                                                                                                                               | 13 |
| 4.7 Radiated power .....                                                                                                                                                      | 14 |
| 5 Measurement procedures .....                                                                                                                                                | 14 |
| 5.1 General .....                                                                                                                                                             | 14 |
| 5.2 Test signals .....                                                                                                                                                        | 14 |
| 5.3 Disturbance voltage at the mains terminals in the frequency range<br>150 kHz to 30 MHz .....                                                                              | 15 |
| 5.3.1 General .....                                                                                                                                                           | 15 |
| 5.3.2 Television receivers .....                                                                                                                                              | 16 |
| 5.3.3 Sound receivers .....                                                                                                                                                   | 17 |
| 5.3.4 Associated equipment .....                                                                                                                                              | 17 |
| 5.3.5 Audio amplifiers .....                                                                                                                                                  | 17 |
| 5.3.6 Measurement of the disturbance voltage at the mains terminals .....                                                                                                     | 18 |
| 5.4 Measurement of disturbance voltage at the antenna terminals of a receiver<br>and associated equipment with an RF input in the frequency range<br>30 MHz to 2,15 GHz ..... | 18 |
| 5.4.1 General .....                                                                                                                                                           | 18 |
| 5.4.2 Measurement on receivers or associated equipment with coaxial<br>antenna connections .....                                                                              | 18 |
| 5.4.3 Measurement on receivers or associated equipment with balanced<br>antenna connectors .....                                                                              | 19 |
| 5.4.4 Presentation of the results .....                                                                                                                                       | 19 |

|       |                                                                                                                                                                                         |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 5.5   | Measurement of the wanted signal and disturbance voltage at the RF output terminals of associated equipment with an RF video modulator, in the frequency range 30 MHz to 2,15 GHz ..... | 19 |
| 5.5.1 | Introduction .....                                                                                                                                                                      | 19 |
| 5.5.2 | Method of measurement.....                                                                                                                                                              | 19 |
| 5.6   | Measurement of disturbance power of associated equipment (video recorders excluded) in the frequency range 30 MHz to 1 GHz .....                                                        | 20 |
| 5.6.1 | General .....                                                                                                                                                                           | 20 |
| 5.6.2 | Method of measurement.....                                                                                                                                                              | 20 |
| 5.6.3 | Measuring procedure .....                                                                                                                                                               | 20 |
| 5.6.4 | Presentation of the results .....                                                                                                                                                       | 21 |
| 5.7   | Measurement of radiation in the frequency range 30 MHz to 1 GHz at 3 m distance.....                                                                                                    | 21 |
| 5.7.1 | Introduction .....                                                                                                                                                                      | 21 |
| 5.7.2 | Measuring site requirements .....                                                                                                                                                       | 22 |
| 5.7.3 | Disposition of the receiver under test .....                                                                                                                                            | 23 |
| 5.7.4 | Disposition of the field-strength meter .....                                                                                                                                           | 23 |
| 5.7.5 | Measurement procedure .....                                                                                                                                                             | 24 |
| 5.8   | Measurement of radiation in the frequency range 1 GHz to 18 GHz .....                                                                                                                   | 24 |
| 5.8.1 | Measuring set-up .....                                                                                                                                                                  | 24 |
| 5.8.2 | Test site validation.....                                                                                                                                                               | 25 |
| 5.8.3 | Measuring procedure .....                                                                                                                                                               | 25 |
| 5.8.4 | Presentation of the results .....                                                                                                                                                       | 26 |
| 5.9   | Measurement of the local oscillator power at the input terminal of the outdoor unit .....                                                                                               | 26 |
| 6     | Interpretation of CISPR radio disturbance limits .....                                                                                                                                  | 26 |
| 6.1   | Significance of a CISPR limit .....                                                                                                                                                     | 26 |
| 6.2   | Compliance with limits on a statistical basis .....                                                                                                                                     | 27 |
|       | Annex A (normative) Broadcast receivers for digital signals.....                                                                                                                        | 34 |
|       | Annex B (informative) Specification of the wanted signal.....                                                                                                                           | 39 |
|       | Annex ZA (normative) Normative references to international publications with their corresponding European publications .....                                                            | 44 |
|       | National Annex NA (informative) CENELEC Interpretation Sheet 1, June 2009 .....                                                                                                         | 45 |
|       | Bibliography .....                                                                                                                                                                      | 47 |
|       | Figure 1 – Colour bar signal levels according to ITU-R Recommendation BT 471-1 (see 5.2) (“red” signal).....                                                                            | 28 |
|       | Figure 2 – Teletext picture (see 5.2) .....                                                                                                                                             | 28 |
|       | Figure 3 – Example of an artificial mains network 50 $\Omega$ -50 $\mu$ H (see 5.3.1).....                                                                                              | 29 |
|       | Figure 4 – Example of artificial mains network 50 $\Omega$ -50 $\mu$ H-5 $\Omega$ (see 5.3.1).....                                                                                      | 29 |
|       | Figure 5 – Measurement of the radiofrequency disturbance voltage injected into the mains (see 5.3.1).....                                                                               | 30 |
|       | Figure 6 – Measurement of the radiofrequency disturbance voltage injected into the mains (top view) (see 5.3.1).....                                                                    | 30 |
|       | Figure 7 – Circuit arrangement for the measurement of disturbance voltages at the coaxial antenna terminals (see 5.4.2).....                                                            | 31 |

|                                                                                                                                                                                |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 8 – Circuit arrangement for receivers with balanced antenna connections<br>(see 5.4.3).....                                                                             | 31 |
| Figure 9 – Circuit arrangement for the measurement of the wanted signal and<br>disturbance voltage at the RF output of video recorders (see 5.5.2).....                        | 31 |
| Figure 10 – Circuit arrangement for the measurement of disturbance power of<br>associated equipment (video recorders excluded) (see 5.6.3).....                                | 32 |
| Figure 11 – Measuring site (see 5.7.2).....                                                                                                                                    | 32 |
| Figure 12 – Check of the site suitability (see 5.7.2) .....                                                                                                                    | 32 |
| Figure 13 – Theoretical site attenuation curve for the range 80 MHz to 1 GHz<br>(see 5.7.2).....                                                                               | 33 |
| Figure 14 – Open-field measurement at 3 m distance (see 5.7.3) .....                                                                                                           | 33 |
| Figure A.1 – Measurement of the radiofrequency disturbance voltage injected into the<br>mains (see 5.1.3 and 5.1.4) in the frequency range 150 kHz to 30 MHz (side view) ..... | 37 |
| Figure A.2 – Example of isolation transformer for 46 MHz to 1,5 GHz .....                                                                                                      | 37 |
| Figure A.3 – Typical size of isolation transformer for 46 MHz to 1,5 GHz .....                                                                                                 | 38 |
| Figure A.4 – Typical characteristic of insertion loss of isolation transformer for 46<br>MHz to 1,5 GHz .....                                                                  | 38 |

## INTRODUCTION

The CISPR recommends that the limits and methods of measurement of radio disturbance characteristics of sound and television receivers contained in the latest edition of CISPR 13, including amendments, be used, without regional or national addenda or modifications. The requirements are considered sufficient to reach adequate emission levels to protect radio broadcast and telecommunication services and to allow other apparatus to operate as intended at a reasonable distance.

## **SOUND AND TELEVISION BROADCAST RECEIVERS AND ASSOCIATED EQUIPMENT – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT**

### **1 Scope and object**

This International Standard applies to the generation of electromagnetic energy from sound and television receivers for the reception of broadcast and similar transmissions and from associated equipment. The frequency range covered extends from 9 kHz to 400 GHz.

No measurements need be performed at frequencies where no limits are specified.

Receiving systems for collective reception, in particular:

- cable distribution head ends (Community Antenna Television, CATV);
- community reception systems (Master Antenna Television, MATV)

are covered by IEC 60728-2.

**A1** Broadcast receivers for digital signals are covered by Annex A and Annex B. **A1**

Information technology equipment (ITE) is excluded, even if intended to be connected to a television broadcast receiver.

The telecommunication port of broadcast receivers, intended to be connected to a telecommunication network, is covered by CISPR 22.

In addition, measurements at the telecommunication port are performed with the broadcast reception functions, which are independent from the telecommunication function, disabled during the measurement.

PC tuner cards are measured according to the relevant clauses of this standard.

This standard describes the methods of measurement applicable to sound and television receivers or associated equipment and specifies limits for the control of disturbance from such equipment.

For multifunction equipment which is subjected simultaneously to different clauses of this standard and/or other standards, details are given in 4.1.

### **2 Normative references**

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

CISPR 16-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*

<sup>A2</sup> CISPR 16-1-4, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances* <sup>A2</sup>

CISPR 16-2, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2: Methods of measurement of disturbances and immunity*

CISPR 22, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

IEC 60050(161), *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60728-2, *Cabled distribution systems for television and sound signals – Part 2: Electromagnetic compatibility for equipment* <sup>1</sup>

ITU-R BT 471-1, *Nomenclature and description of colour bar signals*

### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purposes of this International Standard, the definitions contained in IEC 60050(161) and the following definitions apply.

##### 3.1.1

##### **sound broadcast receivers**

appliances intended for the reception of sound broadcast and similar services for terrestrial, cable and satellite transmission, regardless whether the input signals are digital or analog

##### 3.1.2

##### **television receivers**

appliances intended for the reception of television broadcast and similar services for terrestrial, cable and satellite transmissions, regardless whether the input signals are digital or analog

##### 3.1.3

##### **associated equipment**

equipment either intended to be connected directly to sound or television broadcast receivers, or to generate or reproduce audio or visual information

NOTE 1 Tuners may be provided with a broadcast-satellite-receiving stage and with demodulators, decoders, demultiplexers, D/A converters, encoders (e.g. NTSC, PAL or SECAM encoders), etc.

NOTE 2 Frequency converters may be provided with a broadcast-satellite-receiving stage and with devices which convert the signals to other frequency bands.

NOTE 3 Receivers, tuners, or frequency converters may be tuneable or may only be able to receive a fixed frequency.

<sup>1</sup> To be published.

### **3.1.4**

#### **PC tuner cards**

sound broadcast receiver cards and television broadcast receiver cards, either to be inserted in personal computers or permanently integrated therein

### **3.1.5**

#### **outdoor unit of direct to home satellite receiving systems for individual reception**

unit consisting of the antenna, the feeding network and the low-noise amplifier with its associated down-converter. The intermediate frequency amplifier and the demodulator are not included

### **3.1.6**

#### **multifunction equipment**

appliances in which two or more functions are provided in the same unit, for instance television reception, radio reception, digital clock, tape-recorder or disc player, etc.

## **3.2 Abbreviations**

|               |                                               |
|---------------|-----------------------------------------------|
| AM            | Amplitude Modulation                          |
| CATV          | Community Antenna Television                  |
| CD            | Compact Disc                                  |
| FM            | Frequency Modulation                          |
| ITE           | Information Technology Equipment              |
| ITU-R         | International Telecommunication Union – Radio |
| LW, MW and SW | Long-, Medium- and Short-Waves                |
| MATV          | Master Antenna Television                     |
| PC            | Personal Computer                             |
| RF            | Radio Frequency                               |

## **4 Limits of disturbance**

### **4.1 General**

For RF disturbances the level shall not exceed the limits specified in 4.2 to 4.7 when measured using the methods given in clause 5. Where there is frequency duplication at the boundary of two ranges, the lower limit shall apply. For equipment in large-scale production, it is required that, with 80 % confidence, at least 80 % of production complies with the limits (see clause 6).

Multifunction equipment which is subjected simultaneously to different clauses of this standard and/or other standards shall be tested with each function operated in isolation, if this can be achieved without modifying the equipment internally. The equipment thus tested shall be deemed to have complied with the requirements of all clauses/standards when each function has satisfied the requirements of the relevant clause/standard.

For equipment for which it is not practical to test with each function operated in isolation, or where the isolation of a particular function would result in the equipment being unable to fulfil its primary function, the equipment shall be deemed to have complied if it meets the provisions of the relevant clause/standard with the necessary functions operative.

#### 4.2 Disturbance voltage at the mains terminals

Measurements shall be made in accordance with 5.3.

**Table 1 – Limits of disturbance voltage at the mains terminals**

| Equipment type                                                        | Frequency range<br>MHz | Limit values<br>dB(μV) |                       |
|-----------------------------------------------------------------------|------------------------|------------------------|-----------------------|
|                                                                       |                        | Quasi-peak             | Average               |
| Television and sound receivers<br>and associated equipment            | 0,15 to 0,5            | 66 to 56 <sup>a</sup>  | 56 to 46 <sup>a</sup> |
|                                                                       | 0,5 to 5               | 56                     | 46                    |
|                                                                       | 5 to 30                | 60                     | 50                    |
| <sup>a</sup> Decreasing linearly with the logarithm of the frequency. |                        |                        |                       |

NOTE 1 If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.

NOTE 2 The higher value measured with and without the outer conductor screen of the antenna terminal connected to earth is considered.

NOTE 3 Television receivers with teletext facilities should be tested in teletext mode with teletext picture.

#### 4.3 Disturbance voltage at the antenna terminals

Measurements of the antenna terminal voltage shall be made in accordance with 5.4.

The limit values specified correspond to a nominal impedance of 75 Ω.

The limit values for receivers with nominal impedance other than 75 Ω are calculated according to the following formula:

$$L_Z = L_{75} + 10 \log (Z/75) \text{ dB}(\mu\text{V})$$

Table 2 – Limits of disturbance voltage at the antenna terminals

| Equipment type                                                                                        | Source           | Frequency<br>MHz | Limit values<br>dB( $\mu$ V) 75 $\Omega$<br>Quasi-peak <sup>a</sup> |
|-------------------------------------------------------------------------------------------------------|------------------|------------------|---------------------------------------------------------------------|
| Television receivers, video recorders and PC tuner cards working in channels between 30 MHz and 1 GHz | Local oscillator | $\leq 1\ 000$    | Fundamental 46                                                      |
|                                                                                                       |                  | 30 to 950        | Harmonics 46                                                        |
|                                                                                                       |                  | 950 to 2 150     | Harmonics 54                                                        |
|                                                                                                       | Other            | 30 to 2 150      | 46                                                                  |
| Television receivers for broadcast satellite transmissions and tuner units <sup>b</sup>               | Local oscillator | 950 to 2 150     | Fundamental 54                                                      |
|                                                                                                       |                  | 950 to 2 150     | Harmonics 54                                                        |
|                                                                                                       | Other            | 30 to 2 150      | 46                                                                  |
| Frequency modulation sound receivers and PC tuner cards                                               | Local oscillator | $\leq 1\ 000$    | Fundamental 54                                                      |
|                                                                                                       |                  | 30 to 300        | Harmonics 50                                                        |
|                                                                                                       |                  | 300 to 1 000     | Harmonics 52                                                        |
|                                                                                                       | Other            | 30 to 1 000      | 46                                                                  |
| Frequency modulation car radios                                                                       | Local oscillator | $\leq 1\ 000$    | Fundamental 66                                                      |
|                                                                                                       |                  | 30 to 300        | Harmonics 59                                                        |
|                                                                                                       |                  | 300 to 1 000     | Harmonics 52                                                        |
|                                                                                                       | Other            | 30 to 1 000      | 46                                                                  |
| Associated equipment with an RF input, e.g. video tape player, laser disc player                      | Other            | 30 to 2 150      | 46                                                                  |
| <sup>a</sup> At frequencies above 1 GHz the peak detector is used.                                    |                  |                  |                                                                     |
| <sup>b</sup> For tuner units, "antenna terminal" means "first intermediate frequency input terminal". |                  |                  |                                                                     |

NOTE For AM broadcast receivers for LW, MW and SW no limits apply.

#### 4.4 Wanted signal and disturbance voltage at the RF output of equipment with incorporated or with add-on RF video modulator

Measurements of the wanted signal and disturbance voltage at the RF output terminals of equipment with incorporated or with add-on RF video modulator (e.g. of video recorders and decoders) shall be made in accordance with 5.5. If the nominal impedance of the RF output is different from 75  $\Omega$ , the limit level shall be calculated with the formula given in 4.3.

Table 3 – Limits of the wanted signal and disturbance voltage at RF output terminals of equipment with RF video modulator

| Equipment type                                                                    | Source        | Frequency<br>MHz | Limit values<br>dB( $\mu$ V) 75 $\Omega$<br>Quasi-peak <sup>a</sup> |
|-----------------------------------------------------------------------------------|---------------|------------------|---------------------------------------------------------------------|
| Equipment with RF video modulator (e.g. video recorders, camcorders and decoders) | Wanted signal |                  | Carrier frequencies and sidebands 76                                |
|                                                                                   |               | 30 to 950        | Harmonics 46                                                        |
|                                                                                   |               | 950 to 2 150     | Harmonics 54                                                        |
|                                                                                   | Other         | 30 to 2 150      | 46                                                                  |
| <sup>a</sup> At frequencies above 1 GHz the peak detector is used.                |               |                  |                                                                     |

#### 4.5 Disturbance power

Measurements shall be made in accordance with 5.6.

**Table 4 – Limits of disturbance power**

| Equipment type                                       | Frequency<br>MHz | Limit values<br>dB(pW) |                       |
|------------------------------------------------------|------------------|------------------------|-----------------------|
|                                                      |                  | Quasi-peak             | Average               |
| Associated equipment<br>(video recorders excluded)   | 30 to 300        | 45 to 55 <sup>a</sup>  | 35 to 45 <sup>a</sup> |
| <sup>a</sup> Increasing linearly with the frequency. |                  |                        |                       |

NOTE If the limits for the average detector are met when using the quasi-peak detector, the limits for the measurements with average detector are considered to be met.

#### 4.6 Radiated disturbances

Measurements of the disturbance field due to the local oscillator at its fundamental and harmonic frequencies and due to all other sources shall be made in accordance with 5.7.

**Table 5 – Limits of radiated disturbances at 3 m distance**

| Equipment type                                                                                                                                                                 | Source           | Frequency<br>MHz | Limit values<br>dB(μV/m)<br>Quasi-peak |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|----------------------------------------|
| Ⓢ Television receivers,<br>video recorders and PC<br>tuner cards                                                                                                               | Local oscillator | ≤ 1 000          | Fundamental 57 <sup>a</sup>            |
|                                                                                                                                                                                |                  | 30 to 300        | Harmonics 52                           |
|                                                                                                                                                                                |                  | 300 to 1 000     | Harmonics 56                           |
|                                                                                                                                                                                | Other            | 30 to 230        | 40                                     |
|                                                                                                                                                                                |                  | 230 to 1 000     | 47                                     |
| Television and sound<br>receivers for broadcast<br>satellite transmissions<br>(except outdoor units),<br>Infrared remote control<br>units and<br>Infrared headphone<br>systems | Other            | 30 to 230        | 40                                     |
|                                                                                                                                                                                |                  | 230 to 1 000     | 47                                     |
| Frequency modulation<br>sound receivers and PC<br>tuner cards                                                                                                                  | Local oscillator | ≤ 1 000          | Fundamental 60                         |
|                                                                                                                                                                                |                  | 30 to 300        | Harmonics 52                           |
|                                                                                                                                                                                |                  | 300 to 1 000     | Harmonics 56                           |
|                                                                                                                                                                                | Other            | 30 to 230        | 40                                     |
|                                                                                                                                                                                |                  | 230 to 1 000     | 47                                     |
| <sup>a</sup> In Japan: 57 dB(μV/m) is relaxed to 66 dB(μV/m) for operating channels <300 MHz and to 70 dB(μV/m) for operating channels >300 MHz.                               |                  |                  |                                        |
| Ⓢ                                                                                                                                                                              |                  |                  |                                        |

NOTE For car radio receivers and for LW, MW and SW AM broadcast receivers no radiation limits apply.