

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE  
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

AMENDMENT 1 **iTeh STANDARD PREVIEW**  
AMENDEMENT 1 **(standards.iteh.ai)**

**Information technology equipment – Immunity characteristics – Limits and methods of measurement** [CISPR 24:2010/AMD1:2015](https://standards.iteh.ai/catalog/standards/sist/8a57c18d-3857-4b72-9b8f-d2a12982a85a/cispr-24-2010-amd1-2015)

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**Appareils de traitement de l'information – Caractéristiques d'immunité – Limites et méthodes de mesure**



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## FOREWORD

This amendment has been prepared by subcommittee CIS/I: Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers.

The text of this amendment is based on the following documents:

FDIS	Report on voting
CIS/I/500/FDIS	CIS/I/504/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,
- replaced by a revised edition, or
- amended.

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### 4.2.1 Electrostatic discharges (ESD)

*Replace the existing eighth paragraph starting with "For contact discharge..." by the following new paragraph:*

For contact discharges, there is no requirement to apply discharges at voltages below the test level defined in Table 1.

#### 4.2.3.1 General

*Add, at the end of the existing text, the following new text:*

Recognising that a 1 % step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4 % of the previous frequency with a test level of twice the value of the specified test level in order to reduce the testing time for equipment requiring testing in multiple configurations and/or long cycle times.

The step size and test level used shall be recorded in the test report.

**Table 3 – Immunity, input d.c. power port (excluding equipment marketed with a a.c./d.c. power converter)**

Replace the second existing line of this table by the following new line:

3.2	Surges	0,5 1,2/50 (8/20)	kV (peak) Tr/Th $\mu$ s	IEC 61000-4-5	Test applied each line to ground reference See <sup>b</sup>	B
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**Table A.1 – Criteria applied to TTE functions, used during continuous disturbances testing**

Replace the existing table by the following new table:

	TTE Function	Method		
		A.2.2 or A.2.3	A.2.4 or A.2.6	A.2.5
A1.1	Dial capability used to establish a telephony call.	n/a	n/a	Yes (See <sup>a</sup> )
A1.2	Audio receiving capability via an ear piece (headset or handset etc.)	A.2.2 or A.2.3	n/a	n/a
A1.3	Audio transmission capability via a microphone (headset or handset etc.)	n/a	A.2.4 or A.2.6	n/a
A1.4	Hands free operation	A.2.3 using Figure A.3	n/a	n/a
A1.5	Line connection <sup>b</sup>	n/a	A.2.4 or A.2.6	n/a

<sup>a</sup> Only applicable to EUT that provides emergency service call capability.  
<sup>b</sup> A call shall be maintained for the duration of the test.

### A.2.1 General

Replace the existing sixth paragraph starting with "Where possible..." by the following new text:

If it is suspected that the mute functions, echo cancelling capabilities, or noise cancelling circuitry are interfering with the ability to make the measurement, then these features may be disabled and the test performed. Where this is not possible the following method may reduce the influence of the noise and echo cancelling functions. This is dependent on the implementation and the resulting disturbances.

The communication path should be activated in both transmit and receive directions for measurements during the immunity tests, however, since both receive and transmit paths may not be active simultaneously, especially during hands-free operation, the immunity tests for the receive path and the transmit path may need to be assessed separately.

When measurements are carried out in the receive direction, a suitable test signal (for example 300 Hz sine wave) shall be coupled into the receive direction path. The level of this test signal shall be high enough (for example -50 dBm) to activate the receive path and be filtered by the band-pass filter during the immunity test.

When measurements are carried out in the transmit direction, the transmit mode shall be activated with a loudspeaker placed at an appropriate distance from the EUT. The test signal produced by the loudspeaker shall be loud enough for the EUT to activate the transmit path and be filtered by the band-pass filter during the immunity test.

The mute function shall be switched off during testing by the normal procedure.

NOTE These methods may not work in all cases.

The configuration of the EUT with respect to these functions shall be noted in the test report.

*Add, after the existing Table A.5, the following new subclause:*

#### **A.2.6 Measurement method: demodulation sent to digital lines**

For systems that connect to a digital transmission system it is not generally possible to break into the line, as is done in A.2.4 for analogue lines, in order to measure the 1 kHz tone that is demodulated by the EUT and sent to line during the testing of continuous RF disturbances. This is especially the case for Voice over IP (VoIP) applications where the audio sent to line is encoded into packets that may be sent for example via an Ethernet or DSL transmission system.

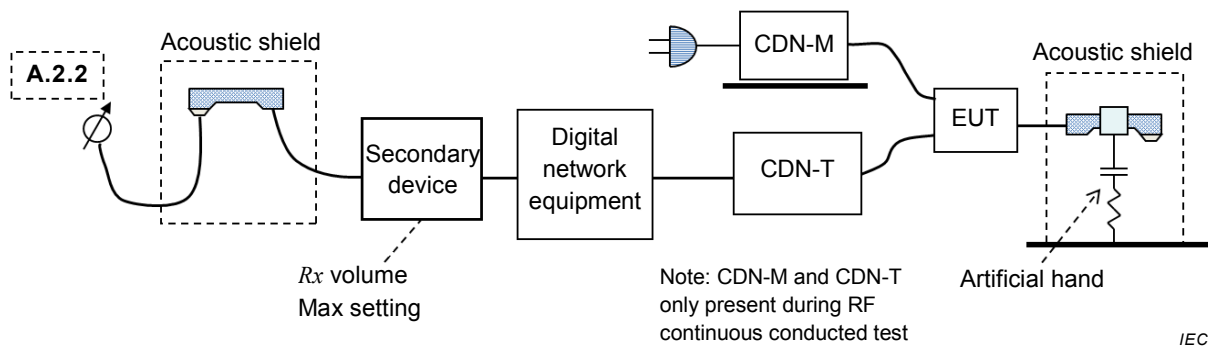
For such digital lines a call shall be established to another telephony device, known as the 'secondary device'. While applying the continuous RF disturbances to the EUT, the acoustic output from the secondary device (the received audio signals from the EUT) shall be measured using the method given in A.2.2 (See example test setup given in Figure A.6). Where lossless acoustic coupling to the secondary device cannot be achieved then the method of A.2.3 shall be used (See example test setup in Figure A.7). The limit levels defined in Table A.2 or A.3 shall be applied to the respective method. It is acceptable to perform the test twice: once while monitoring the demodulated audio levels, and again while evaluating other performance criteria.

When using the method of A.2.3 in order to calibrate the link a 1 kHz Reference Noise Source (RNS) shall be applied to an artificial mouth, in order to generate a known sound pressure level of 89 dB(spl). The reference noise source is coupled to the microphone of the EUT and the output at the receiver of the secondary device is measured. To obtain the actual reference level, subtract 35 dB from the measured value. The background noise shall be at least 15 dB below the established reference level. The reference noise source and artificial mouth are then removed. The acoustic measurements are then relative to the reference level established with the RNS.

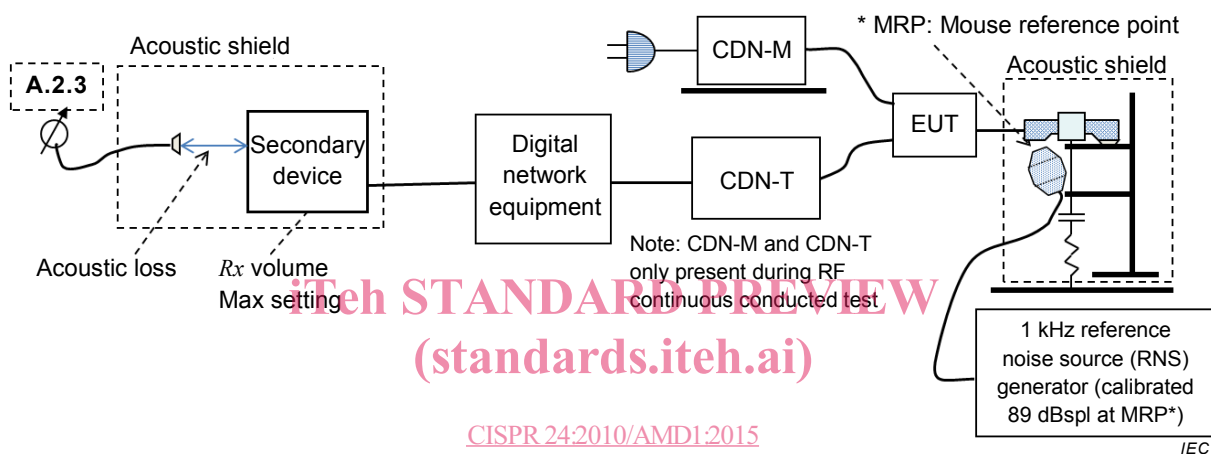
The following points shall be considered:

- Ideally the secondary device should be the same as the EUT.
- The secondary device should be located outside of the test environment, for example in a remote screened room or outside the test chamber and where possible in an acoustically quiet environment.
- Cables leaving the test environment may require additional radio frequency filtering.
- The secondary device should, where applicable, be set up with the same configuration, for example, the setting of gain, noise cancellation and volume control.
- All loudness ratings should be set to their nominal values.
- There is no need to physically break into the line in order to measure the 1 kHz tone sent to line.

This methodology may also be considered as an alternative method for analogue lines if required.



**Figure A.6 – Example test set-up for A.2.6 with secondary device using the method A.2.2**



**Figure A.7 – Example test set-up for A.2.6 with secondary device using the method A.2.3**

**Table A.7 – Test configurations and performance assessment methods applicable to a PABX and associated terminals for continuous RF disturbance tests**

Replace, in the existing table header, "A.2.4" by "A.2.4 or A.2.6".

## H.2 Particular test conditions

Replace, in the fourth existing paragraph of this clause, the last sentence by the following new sentence:

For HDSL and SHDSL, the data rate shall be set at 1 Mbit/s.

## Table H.2 – Example cable attenuation

Replace the existing table by the following new table:

**Table H.2 – Attenuation values representing cable lengths**

<b>DSL technology</b>	<b>Cable attenuation</b>
ADSL/ADSL2	45 dB
ADSL2+	30 dB
ReADSL	70 dB
HDSL	35 dB
SHDSL	42 dB
VDSL/VDSL2	10 dB

*Replace the existing paragraph under Table H.2 by the following new paragraph:*

Tests shall be performed using all representative telecommunications access network cable types that are supported by the EUT, i.e. UTP and/or STP. The cable type(s) used during test shall be recorded in the test report.

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