



SLOVENSKI STANDARD
SIST EN 50289-1-8:2002
01-september-2002

Communication cables - Specifications for test methods - Part 1-8: Electrical test methods - Attenuation (Note: Applies in conjunction with EN 50289-1-1)

Communication cables - Specifications for test methods -- Part 1-8: Electrical test methods - Attenuation

Kommunikationskabel - Spezifikationen für Prüfverfahren -- Teil 1-8: Elektrische Prüfverfahren - Dämpfung

Câbles de communication - Spécifications des méthodes d'essai -- Partie 1-8: Méthodes d'essais électriques - Affaiblissement

<https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002>

Ta slovenski standard je istoveten z: EN 50289-1-8:2001

ICS:

33.120.20 žā / āā ^dā } āā |ā Wires and symmetrical cables

SIST EN 50289-1-8:2002 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 50289-1-8:2002

<https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002>

EUROPEAN STANDARD

EN 50289-1-8

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2001

ICS 33.120.20

English version

**Communication cables -
Specifications for test methods
Part 1-8: Electrical test methods -
Attenuation**

Câbles de communication -
Spécifications des méthodes d'essai
Partie 1-8: Méthodes d'essais électriques -
Affaiblissement

Kommunikationskabel -
Spezifikationen für Prüfverfahren
Teil 1-8: Elektrische Prüfverfahren -
Dämpfung

iTeh STANDARD PREVIEW

This European Standard was approved by CENELEC on 2001-03-01. 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.

[SIST EN 50289-1-8:2002](#)

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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

This European Standard was prepared by SC 46XC, Multicore, Multipair and Quad Data communication cables, of Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50289-1-8 on 2001-03-01.

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) 2002-04-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-04-01

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50289-1-8:2002](https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002)

<https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002>

Contents

1	Scope	4
2	Normative references	4
3	Definitions	4
4	Test method for insertion loss	5
4.1	Test Equipment.....	5
4.2	Test sample	5
4.2.1	<i>Calibration procedure</i>	5
4.2.2	<i>Measuring procedure</i>	6
5	Expression of test results	6
5.1	Expression	6
5.2	Temperature correction.....	7
6	Test report	7

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50289-1-8:2002](https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002)

<https://standards.iteh.ai/catalog/standards/sist/6a2b7aae-4ea5-427e-b23c-772968692d96/sist-en-50289-1-8-2002>

1 Scope

Part 1-8 of EN 50289 details the test methods to determine attenuation of finished cables used in analogue and digital communication systems.

It is to be read in conjunction with Part 1-1 of EN 50289, which contains essential provisions for its application.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50289-1-1	2001	Communication cables – Specifications for tests methods -- Part 1-1: Electrical test methods – General requirements
EN 50289-1-11	2001	Communication cables - Specifications for test methods -- Part 1-11: Electrical test methods - Characteristic impedance, input impedance, return loss
EN 50290-1-2 ¹⁾	-	Communication cables -- Part 1-2: Definitions

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3 Definitions

SIST EN 50289-1-8:2002

For the purposes of this standard, the definitions of EN 50290-1-1 apply in addition to the following ones.

3.1

cable attenuation

the attenuation of a sinusoidal wave along the cable (independent of the connecting hardware) can be derived from an open/short measurement as described in EN 50289-1-11

$$\alpha \bullet L = 8,686/2 \times \operatorname{arctanh} \left[\frac{2A}{(1 + A^2) \times \cos(B)} \right] \quad \text{in dB} \quad (1)$$

$$A = \sqrt{\frac{|Z_s|}{|Z_0|}} \quad (2)$$

$$B = \frac{1}{2}(\varphi_s - \varphi_0) \quad (3)$$

¹⁾ At draft stage

where

α	=	cable attenuation in dB/m
L	=	cable length in meter
$ Z_0 $	=	magnitude of the input impedance of the cable with an open circuit at the cable end
$ Z_s $	=	magnitude of the input impedance of the cable with a short circuit at the cable end
φ_0	=	phase angle of the input impedance of the cable with an open circuit at the cable end
φ_s	=	phase angle of the input impedance of the cable with a short circuit at the cable end

3.2

insertion loss

the loss introduced by inserting a cable or cable assembly into a system. It is the logarithm of the ratio expressed in dB of the power P_1 delivered to a receiver directly connected to a generator and Power P_2 delivered to the same receiver when a cable or cable assembly is inserted between the generator and receiver. It is measured by the transmission method described below

$$\text{Insertion loss} = 10 \log(P_1/P_2) \quad (4)$$

NOTE When corrected for cable length and under matched conditions insertion loss and cable attenuation are equivalent.

4 Test method for insertion loss (standards.iteh.ai)

4.1 Test equipment

The test equipment shall be matched to the nominal impedance of the cable under test (CUT). When symmetrical cables are to be measured, the test equipment has to be balanced. As an alternative to a network analyser a generator and vector voltmeter may be used.

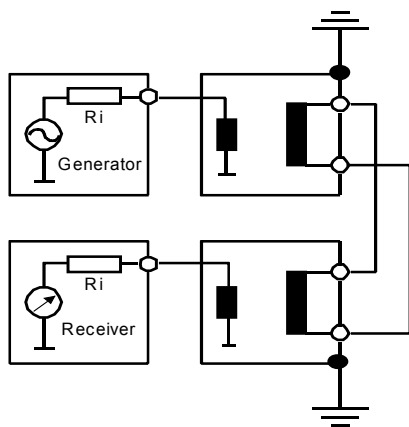
Accuracy of test set-up shall be better than 1 %.

4.2 Test sample

When symmetrical cables are to be measured, the ends of the CUT shall be prepared, such that when connected to the terminals of the test equipment the twisting of the pairs/quads is maintained.

4.2.1 Calibration procedure

The insertion loss of the test set-up (including the impedance matching devices) shall be measured over the whole specified frequency range. The calibration data shall be recorded to enable the test results to be corrected to an insertion loss measurement.



The connection between the test ports during calibration shall be as short as possible and well matched

Figure 1 - Calibration set-up

4.2.2 Measuring procedure

The CUT shall be connected to the test ports of the measuring devices/baluns. The connection of the CUT to the test ports shall be optimised, such that mismatching is minimised.

The attenuation shall be measured over the whole specified frequency range and at the same frequency points as for the calibration procedure within the specified frequency range. All pairs/quads of the CUT shall be measured.

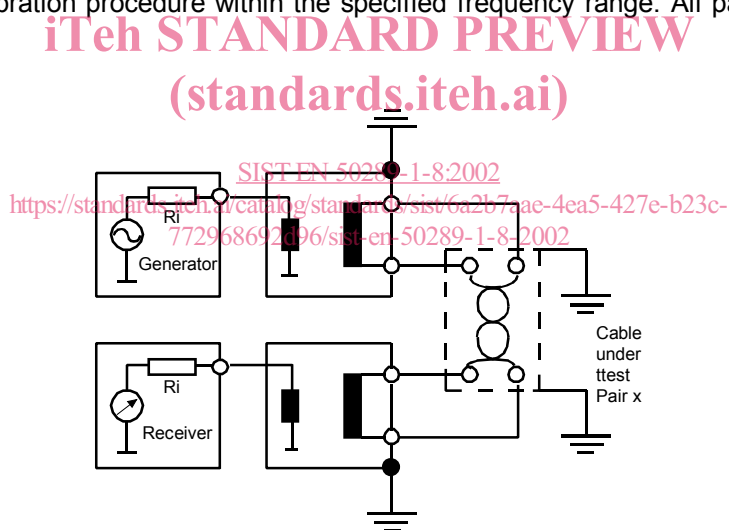


Figure 1 - Measuring set-up

5 Expression of test results

5.1 Expression

$$a_L(f) = |a_{\text{meas}}(f) - a_{\text{cal}}(f)| \times 100/L \quad (\text{dB}/100\text{m}) \quad (5)$$

where

L = cable length in meter

$a_{\text{cal}}(f)$ = insertion loss measured at calibration procedure at ambient temperature

$a_L(f)$ = attenuation of CUT at ambient temperature corrected to 100 m

$a_{\text{meas}}(f)$ = insertion loss measured with measuring procedure at ambient temperature