SLOVENSKI STANDARD
SIST EN 50289-1-17:2016

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Komunikacijski kabli - Specifikacije za preskusne metode - 1-17. del: Električne preskusne metode - Eksogeni (tujerodni) presluh ExNEXT in ExFEXT

Communications cables - Specifications for test methods Part 1-17: Electrical test methods - Exogenous Crosstalk ExNEXT and ExFEXT

Kommunikationskabel - Spezifikationen für Prüfverfahren - Teil 1-17: Elektrische Prüfverfahren – Externes Nebensprechen ExNEXT und ExFEXT (Nebensprechen zwischen Kabeln)

Câbles de communication - Spécifications des méthodes d'essai - Partie 1-17: Méthodes d'essais électriques - Diaphonie exogène ExNEXT et ExFEXT

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Contents

European foreword

This document (EN 50289-1-17:2015) has been prepared by SC46 XC “Multicore, multipair and quad data communication cables” of CLC/TC 46X “Communication cables”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-09-28
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2018-09-28

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1 Scope

Part 1-17 of EN 50289 details the test methods used to determine the cable to cable (exogenous) crosstalk between 4 pair cables used in analogue and digital communication systems. These exogenous Crosstalk effects are near end crosstalk (ExNEXT), far end crosstalk (ExFEXT), equal level far end crosstalk (ExELFEXT).

This document should be read in conjunction with EN 50289-1-1, which contains essential provisions for its application. Reference is made also to EN 50289-1-10 in which the definitions and test methods for crosstalk is given.

The exogenous crosstalk test method is described, as well as the treatment of the results to simulate the installation condition of a disturbed cable in contact with six disturbing cables.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50290-1-2, *Communication cables — Part 1-2: Definitions*

IEC 61156-1:2007, *Multicore and symmetrical pair/quad cables for digital communications — Part 1: Generic specification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50290-1-2 together with the following apply.

3.1
exogenous near end crosstalk (NEXT)

when tested in accordance with 6.3.7 to 6.3.9 of IEC 61156-1:2007

$$ExNEXT = 10 \times LOG_{10}(P_{1N}/P_{2N}) \text{ (dB)} \quad (1)$$

Where

P_{1N} = input power into the disturbing pair;

P_{2N} = output power of the disturbed pair cable at near end,

where the disturbing and disturbed pairs are in different cables;

ExNEXT= exogenous near end crosstalk.

3.2
exogenous far end crosstalk

3.2.1
exogenous input/output-FEXT

$$Ex\ IO\ FEXT = 10 \times LOG_{10}(P_{1N}/P_{2F}) \text{ (dB)} \quad (2)$$

Where

P_{1N} = input power into the disturbing pair at the near end;

P_{2F} = output power of the disturbed pair at far end,

where the disturbing and disturbed pairs are in different cables;

IO FEXT = far end crosstalk.

3.2.2
equal level far end crosstalk (ExACR-F)

$$ExACR\text{-}F = 10 \times LOG_{10}(P_{1F}/P_{2F}) \text{ (dB)} \quad (3)$$

Where

P_{1F} = output power of the disturbing pair at the far end ;

P_{2F} = output power of the disturbed pair at far end,

where the disturbing and disturbed pairs are in different cables

EL FEXT = IO FEXT - $\alpha \bullet L$

$\alpha \bullet L$ = measured attenuation of the disturbed pair of the CUT

3.3
Power Sum (PS)

it describes the influence on one circuit of the rest of the circuits, when each of these is fed with the input power P_{1N} and is calculated

4 Test method

4.1 Equipment

To be in accordance with that described in 6.3.7 to 6.3.9 of IEC 61156-1:2007.

4.2 Test sample

to be in accordance with that specified in 6.3.7 to 6.3.9 of IEC 61156-1:2007.

4.3 Test procedure

4.3.1 General

To be carried out in accordance with 6.3.7 to 6.3.9 of IEC 61156-1:2007.

4.3.2 ExNEXT, PSExNEXT

To be determined in accordance with 6.3.7 to 6.3.9 of IEC 61156-1:2007.

4.3.3 ExFEXT, ExACR-F, PSExACR-F

To be determined in accordance with 6.3.7 to 6.3.9 of IEC 61156-1:2007.

5 Test report

The test report shall give the test conditions:

- temperature;
- frequency range;

and record the crosstalk as required.

ACR may be given when requested.

Annex A
NEXT scaling factor

Formula for scaling NEXT results on short lengths to 100 m:

$$Nx = No - 10\ log_{10}\left(\frac{1 - e^{-4\alpha Lo}}{1 - e^{-4\alpha Lx}}\right) \quad \text{(A.1)}$$

Where:

Nx = NEXT [dB/100m];

No = NEXT on the short cable length [dB/cable length];

α = attenuation [nepers/m];

Lo = cable length [m];

Lx = 100 [m].

At high frequencies the difference between 30 m and 100 m results for NEXT are negligible. However, at lower frequency the differences range from 3,9 dB at 1 MHz up to 0,1 dB at 200 MHz.

Either the limit should change or the factor should be added to the result to account for the short measurement length.