



NSAI
Standards

Irish Standard
I.S. EN 61300-3-50:2013

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-50: Examinations and measurements - Crosstalk for optical spatial switches

I.S. EN 61300-3-50:2013

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 61300-3-50:2013 is the adopted Irish version of the European Document EN 61300-3-50:2013, Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-50: Examinations and measurements - Crosstalk for optical spatial switches

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61300-3-50

July 2013

ICS 33.180.20

English version

**Fibre optic interconnecting devices and passive components -
Basic test and measurement procedures -
Part 3-50: Examinations and measurements -
Crosstalk for optical spatial switches
(IEC 61300-3-50:2013)**

Dispositifs d'interconnexion et
composants passifs à fibres optiques -
Procédures fondamentales d'essais
et de mesures -
Partie 3-50: Examens et mesures -
Diaphonie relative aux commutateurs
spatiaux optiques
(CEI 61300-3-50:2013)

Lichtwellenleiter -
Verbindungselemente und passive
Bauteile -
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Messungen -
Übersprechen bei räumlichen
Umschaltern für Lichtwellenleiter
(IEC 61300-3-50:2013)

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Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86B/3593/FDIS, future edition 1 of IEC 61300-3-50, prepared by IEC/TC 86B "Fibre optic interconnecting devices and passive components" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61300-3-50:2013.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-03-21
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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62074-1	NOTE	Harmonised as EN 62074-1.
IEC 61300-3-29	NOTE	Harmonised as EN 61300-3-29.
IEC 60876-1	NOTE	Harmonised as EN 60876-1.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61300-1	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	EN 61300-1	-
IEC 61300-3-2	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-2: Examinations and measurements - Polarization dependent loss in a single-mode fibre optic device	EN 61300-3-2	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
COMMISSION ÉLECTROTECHNIQUE INTERNATIONALEIEC 61300-3-50
Edition 1.0 2013-05IEC 61300-3-50
Édition 1.0 2013-05FIBRE OPTIC INTERCONNECTING DEVICES AND
PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT
PROCEDURES –DISPOSITIFS D'INTERCONNEXION ET
COMPOSANTS PASSIFS A FIBRES OPTIQUES –
PROCEDURES FONDAMENTALES D'ESSAIS ET
DE MESURES –Part 3-50: Examinations and measurements –
Crosstalk for optical spatial switchesPartie 3-50: Examens et mesures – Diaphonie
relative aux commutateurs spatiaux optiques

CORRIGENDUM 2

Corrections to the French version appear after the English text.

Les corrections à la version française sont données après le texte anglais.

5.6 Measurement for other input ports

Replace the existing text with the following new text

Change the connection of light source S to another input port l_j ($j = 2$ to M). Repeat the procedure of 5.2 to 5.5.

6.1 Calculation of crosstalk for specified port pairs

Replace the existing second paragraph with the following new paragraph

This crosstalk is the crosstalk of signal light 1 with signal light 2 as noise for signal light 1 for output port O_1 , when this DUT is used for $M \times N$ (M input ports and N output ports), connected port I_1 to port O_1 and input signal light 1 from port O_1 , signal light 2 from port O_2 .

6.2 Calculation of total crosstalk for a specified output port

Replace the existing Equation (5) with the following new Equation (5)

$$XT_{\text{tot}}(O_1) = 10 \log_{10} \left(\sum_{i=2}^{i=N} 10^{\frac{1}{10} P_i} \right) - P_1 \quad (5)$$

where P_i is given in 5.5.

Replace the existing Equation (6) with the following new Equation (6)

$$XT_{\text{tot}}(O_1) = IL_{\text{max},11} + 10 \log_{10} \left(\sum_{i=2}^{i=N} 10^{-\frac{1}{10} IL_{\text{min},1i}} \right) \quad (6)$$

Corrections à la version française:

5.6 Mesure pour d'autres ports d'entrée

Remplacer le texte existant par le nouveau texte suivant

Modifier la connexion de la source de rayonnement lumineux S à un autre port d'entrée I_j ($j = 2$ à M). Répéter la procédure du 5.2 au 5.5.

6.1 Calcul de la diaphonie pour les paires de port spécifiées

Remplacer le deuxième alinéa existant par le nouvel alinéa suivant

Cette diaphonie est la diaphonie du signal lumineux 1 avec le signal lumineux 2, considéré comme bruit pour le signal lumineux 1, sur le port de sortie O_1 , lorsque ce DUT est utilisé en $M \times N$ (M ports d'entrée et N ports de sortie), port connecté I_1 au port O_1 et le signal lumineux d'entrée 1 émanant du port O_1 , le signal lumineux 2 du port O_2 .

6.2 Calcul de la diaphonie totale pour un port de sortie spécifié

Remplacer l'Equation (5) existante par la nouvelle Equation (5) suivante

$$XT_{\text{tot}}(O_1) = 10 \log_{10} \left(\sum_{i=2}^{i=N} 10^{\frac{1}{10} P_i} \right) - P_1 \quad (5)$$

où P_i est donné en 5.5.

Remplacer l'Equation (6) existante par la nouvelle Equation (6) suivante

$$XT_{\text{tot}}(O_1) = IL_{\text{max},11} + 10 \log_{10} \left(\sum_{i=2}^{i=N} 10^{-\frac{1}{10} IL_{\text{min},1i}} \right) \quad (6)$$



IEC 61300-3-50

Edition 1.0 2013-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 3-50: Examinations and measurements – Crosstalk for optical spatial switches**

**Dispositifs d'interconnexion et composants passifs à fibres optiques –
Procédures fondamentales d'essais et de mesures –
Partie 3-50: Examens et mesures – Diaphonie relative aux commutateurs spatiaux optiques**





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IEC 61300-3-50

Edition 1.0 2013-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 3-50: Examinations and measurements – Crosstalk for optical spatial switches**

**Dispositifs d'interconnexion et composants passifs à fibres optiques –
Procédures fondamentales d'essais et de mesures –
Partie 3-50: Examens et mesures – Diaphonie relative aux commutateurs spatiaux optiques**

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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references	5
3 General description	5
4 Apparatus.....	6
4.1 Light source S	6
4.2 Temporary joint TJ	7
4.3 Terminations T	7
4.4 Detector D	7
5 Measurement procedure.....	7
5.1 General	7
5.2 Test set-up	7
5.3 Measurement of P_1	8
5.4 Measurement of P_2	8
5.5 Measurement of P_i ($i=3$ to N).....	9
5.6 Measurement for other input ports	9
6 Calculation	9
6.1 Calculation of crosstalk for specified port pairs.....	9
6.2 Calculation of total crosstalk for a specified output port	10
6.3 Crosstalk of $M \times N$ fibre optic switch.....	10
6.4 Total crosstalk of $M \times N$ fibre optic switch.....	10
7 Details to be specified	10
7.1 Light source	10
7.2 Temporary joint	11
7.3 Terminations	11
7.4 Detector	11
7.5 DUT	11
7.6 Others	11
Bibliography.....	12
Figure 1 – Crosstalk for $N \times 1$ optical switch	6
Figure 2 – Measurement set-up of crosstalk for $1 \times N$ optical switch	6
Figure 3 – Measurement setup of P_1	8
Figure 4 – Measurement set-up of P_2	9

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING
DEVICES AND PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –**
**Part 3-50: Examinations and measurements –
Crosstalk for optical spatial switches**

FOREWORD

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International Standard IEC 61300-3-50 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86B/3593/FDIS	86B/3622/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61300 series, published under the general title, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures* can be found on the IEC website.

The committee has decided that the contents of this 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

- reconfirmed,
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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 3-50: Examinations and measurements – Crosstalk for optical spatial switches

1 Scope

This part of IEC 61300 describes the procedure to measure the crosstalk of optical signals between the ports of a multiport $M \times N$ (M input ports and N output ports) fibre optic spatial switch. The crosstalk is defined as the ratio of the optical power at an output port which comes from the unconnected input port, to the optical power at the output port which comes from the connected input port.

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.

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-3-2, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-2: Examinations and measurements – Polarization dependent loss in a single-mode fibre optic device*

3 General description

The general meaning of crosstalk is the ratio of an undesired signal power to a desired signal power. The crosstalk of $N \times 1$ (N input ports and one output port) fibre optic spatial switches is shown in Figure 1. For an $N \times M$ (N input ports and M output ports) fibre optic switch, the crosstalk is the same as that for an $N \times 1$ optical switch but expanded across M output ports. A fibre optic switch is basically bidirectional, i.e. a $1 \times N$ (1 input port and N output ports) optical switches can operate as an $N \times 1$ (N input ports and 1 output port) switch. The crosstalk for an $N \times 1$ optical switch is measured as a $1 \times N$ optical switch, as shown in Figure 2. When the input port for a $1 \times N$ optical switch is connected to a light source, the crosstalk for a transmitting output port versus an isolated output port is the ratio of output power of these two output ports, expressed in decibels. Crosstalk is a negative value in dB.

Do not use “isolation” in place of “crosstalk” as the two have a different values and meanings. The meaning of isolation is the optical loss for a port pair intended to block transmission, i.e. for which loss is nominally infinite. Isolation is a positive value in dB. Crosstalk is a negative value in dB.

NOTE 1 For WDM devices, crosstalk is defined as the value of the ratio between the optical power of the specified signal and all noise, as defined in IEC 62074-1 [1]¹. The crosstalk for WDM devices is generally used as

¹ Numbers in square brackets refer to the Bibliography.

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