Irish Standard
I.S. EN 61290-3-3:2014

Optical amplifiers - Test methods -- Part 3-3: Noise figure parameters - Signal power to total ASE power ratio

I.S. EN 61290-3-3:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:	*Published:*
EN 61290-3-3:2014	2014-02-07

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2014-02-18	33.180.30
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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN 61290-3-3

February 2014

ICS 33.180.30

English version

Optical amplifiers - Test methods - Part 3-3: Noise figure parameters - Signal power to total ASE power ratio

(IEC 61290-3-3:2013)

Amplificateurs optiques - Méthodes d'essais - Partie 3-3: Paramètres du facteur de bruit - Rapport puissance du signal sur puissance totale d'ESA (CEI 61290-3-3:2013)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 86C/1121/CDV, future edition 1 of IEC 61290-3-3, prepared by SC 86C, "Fibre optic systems and active devices", of IEC/TC 86, "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61290-3-3:2014.

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)	2014-09-12
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The text of the International Standard IEC 61290-3-3:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61290-3-1	NOTE	Harmonized as EN 61290-3-1.
IEC 61290-3-2	NOTE	Harmonized as EN 61290-3-2.

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.

Publication	Year	Title	EN/HD	Year
IEC 61290-3	-	Optical amplifiers - Test methods - Part 3: Noise figure parameters	EN 61290-3	-
IEC 61291-1	2012	Optical amplifiers - Part 1: Generic specification	EN 61291-1	2012

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IEC 61290-3-3

Edition 1.0 2013-11

INTERNATIONAL STANDARD

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Amplificateurs optiques – Méthodes d'essais – Partie 3-3: Paramètres du facteur de bruit – Rapport puissance du signal sur puissance totale d'ESA

IEC 61290-3-3:2013

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IEC 61290-3-3

Edition 1.0 2013-11

INTERNATIONAL STANDARD

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

Q

ICS 33.180.30

ISBN 978-2-8322-1173-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61290-3-3 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

CDV	Report on voting
86C/1121/CDV	86C/1184/RVC

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 61290 series, published under the general title *Optical amplifiers – Test methods,* 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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OPTICAL AMPLIFIERS – TEST METHODS –

Part 3-3: Noise figure parameters – Signal power to total ASE power ratio

1 Scope and object

This part of IEC 61290-3 applies to all commercially available single channel optical amplifiers (OAs), including OAs using optically pumped fibres (OFAs) based on either rare-earth doped fibres or on the Raman effect, semiconductor optical amplifier modules (SOA modules) and planar optical waveguide amplifiers (POWAs). More specifically, it applies to single channel OAs placed before optical receivers, where there are no optical bandpass filtering elements placed between the OA and the receiver.

The object of this part of IEC 61290-3 is to establish uniform requirements for accurate and reliable measurement of the ratio of the signal output power to the total ASE power generated by the OA in the optical bandwidth of the receiver. This quantity is a measure of the spontaneous-spontaneous beat noise at the receiver, and is correlated to the spontaneous-spontaneous noise factor of the OA, $F_{sp\text{-}sp}$, as defined in IEC 61290-3 and IEC 61291-1.

IEC 61290-3-1 describes a measurement method, using an optical spectrum analyzer, OSA, for the signal-spontaneous noise factor F_{sig-sp} but does not describe a method for measuring $F_{sp\text{-}sp}$. IEC 61290-3-2 describes a measurement method, using an electrical spectrum analyzer (ESA), for the total noise factor $F_{sp\text{-}sp} + F_{sig\text{-}sp}$. However, this method does not allow $F_{sp\text{-}sp}$ to be measured separately, and therefore does not provide a means of directly quantifying the effect of spontaneous-spontaneous beat noise at the receiver. This part of IEC 61290-3 complements IEC 61290-3-1 and IEC 61290-3-2 in that it provides such a means.

Two measurement methods are provided for the ratio of the signal output power to the total ASE power. The first method uses an OSA, while the second method uses a bandpass filter and an optical power meter.

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 61290-3, *Optical amplifiers – Test methods – Part 3: Noise figure parameters*

IEC 61291-1:2012, *Optical fibre amplifiers – Part 1: Generic specification*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.