

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 61290-3:2008 sisaldab Euroopa standardi EN 61290-3:2008 ingliskeelset teksti.</p> <p>Standard on kinnitatud Eesti Standardikeskuse 24.11.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 17.10.2008.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 61290-3:2008 consists of the English text of the European standard EN 61290-3:2008.</p> <p>This standard is ratified with the order of Estonian Centre for Standardisation dated 24.11.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p> <p>Date of Availability of the European standard text 17.10.2008.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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Võtmesõnad: amplifiers, basic specification, electrical engineering, measuring techniques, noise (spurious signals), noise factors, noise figure, noise measurements, optical fibres, optical waveguides, optics, specification, testing

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English version

**Optical amplifiers -
Test methods -
Part 3: Noise figure parameters
(IEC 61290-3:2008)**

Amplificateurs optiques -
Méthodes d'essais -
Partie 3: Paramètres du facteur de bruit
(CEI 61290-3:2008)

Lichtwellenleiter-Verstärker -
Prüfverfahren -
Teil 3: Rauschzahlparameter
(IEC 61290-3:2008)

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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

The text of document 86C/842/FDIS, future edition 2 of IEC 61290-3, 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 was approved by CENELEC as EN 61290-3 on 2008-10-01.

This European Standard supersedes EN 61290-3:2000.

EN 61290-3:2008 includes updates to specifically address additional types of optical amplifiers and to highlight that the EN 61290-3 series pertains to single-channel amplifiers. References have been added to the documents pertaining to multichannel amplifiers.

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) 2009-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61290-3:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61290-10 NOTE Harmonized in EN 61290-10 series (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. 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 61290-3-1	- ¹⁾	Optical amplifiers - Test methods - Part 3-1: Noise figure parameters - Optical spectrum analyzer method	EN 61290-3-1	2003 ²⁾
IEC 61290-3-2	- ¹⁾	Optical amplifiers - Test methods - Part 3-2: Noise figure parameters - Electrical spectrum analyzer method	EN 61290-3-2	2008 ²⁾
IEC 61291-1	- ¹⁾	Optical amplifiers - Part 1: Generic specification	EN 61291-1	2006 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope and object.....	6
2 Normative references	6
3 Acronyms and abbreviations.....	6
4 Noise figure generalities	7
5 Noise figure contributions	8
6 Noise figure test methods	9
Bibliography.....	11
Table 1 – Parameters measurable with each of the two methods of Clause 5.....	10

INTRODUCTION

This International Standard is devoted to the subject of optical amplifiers. The technology of optical amplifiers is still evolving, hence amendments to and new editions of this standard can be expected. Each abbreviation introduced in this standard is explained in the text at least the first time it appears. However, for an easier understanding of the whole text, a list of all abbreviations used in this standard is given in Clause 3.

OPTICAL AMPLIFIERS – TEST METHODS –

Part 3: Noise figure parameters

1 Scope and object

This International Standard applies to all commercially available optical amplifiers (OAs), including OAs using optically pumped fibres (OFAs based on either rare-earth doped fibres or on the Raman effect), semiconductor optical amplifiers (SOAs) and planar waveguide optical amplifiers (PWOAs).

The object of this standard is to provide the general background for OA noise figure parameters measurements and to indicate those IEC standard test methods for accurate and reliable measurements of the following OA parameters, as defined in IEC 61291-1:

- a) noise figure (NF);
- b) noise factor (F);
- c) multiple path interference (MPI) figure of merit;
- d) signal-spontaneous noise figure;
- e) (equivalent) spontaneous-spontaneous optical bandwidth (B_{sp-sp});
- f) forward amplified spontaneous emission (ASE) power level;
- g) reverse ASE power level;
- h) ASE bandwidth.

This standard addresses measurement of OAs that are to be used for amplifying single channels, that is signals from a single transmitter. Testing of OAs for multichannel use involves additional considerations, such as: the number, wavelengths and relative power of the signals, the ability to measure signals simultaneously and to measure the ASE between channels.

NOTE Methods for measurement of OAs for multichannel use are included in the IEC 61290-10 series.

2 Normative references

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

IEC 61290-3-1, *Optical amplifiers – Test methods – Part 3-1: Noise figure parameters – Optical spectrum analyzer method*

IEC 61290-3-2, *Optical amplifiers – Part 3-2: Test methods for noise figure parameters – Electrical spectrum analyzer method*

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

3 Acronyms and abbreviations

ASE	amplified spontaneous emission
B_{sp-sp}	(equivalent) spontaneous-spontaneous optical bandwidth