

**Optical amplifier test methods -- Part 3-2: Noise
figure parameters - Electrical spectrum analyzer
method**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 61290-3-2:2008 sisaldab Euroopa standardi EN 61290-3-2:2008 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 61290-3-2:2008 consists of the English text of the European standard EN 61290-3-2:2008.</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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English version

**Optical amplifiers -
Test methods -
Part 3-2: Noise figure parameters -
Electrical spectrum analyzer method
(IEC 61290-3-2:2008)**

Amplificateurs optiques -
Méthodes d'essais -
Partie 3-2: Paramètres du facteur de bruit -
Méthode de l'analyseur spectral électrique
(CEI 61290-3-2:2008)

Lichtwellenleiter-Verstärker -
Prüfverfahren -
Teil 3-2: Rauschzahlparameter -
Verfahren mit elektrischem
Spektralanalysator
(IEC 61290-3-2:2008)

This European Standard was approved by CENELEC on 2008-10-01. 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.

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, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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

The text of document 86C/784/CDV, future edition 2 of IEC 61290-3-2, 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 61290-3-2 on 2008-10-01.

This European Standard supersedes EN 61290-3-2:2003.

EN 61290-3-2:2008 includes updates to specifically address all types of optical amplifiers, not just optical fibre amplifiers.

This standard is to be used in conjunction with EN 61290-3 and EN 61291-1.

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 61290-3-2:2008 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 60793	NOTE	Harmonized in EN 60793 series (modified).
IEC 60825-1	NOTE	Harmonized as EN 60825-1:2007 (not modified).
IEC 60825-2	NOTE	Harmonized as EN 60825-2:2004 (not modified).
IEC 60874-1	NOTE	Harmonized as EN 60874-1:2007 (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 60728-6	- ¹⁾	Cable networks for television signals, sound signals and interactive services - Part 6: Optical equipment	EN 60728-6	2003 ²⁾
IEC 61290-3	- ¹⁾	Optical amplifiers - Test methods - Part 3: Noise figure parameters	EN 61290-3	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.

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INTRODUCTION

This part of IEC 61290 is devoted to the subject of optical amplifiers. The technology of optical amplifiers is still rapidly evolving, hence amendments and new additions to this standard can be expected.

Each symbol and abbreviation introduced in this standard is generally explained in the text the first time it appears. However, for an easier understanding of the whole text, a list of all symbols and abbreviations used in this standard is given in Clause 3.

OPTICAL AMPLIFIERS – TEST METHODS –

Part 3-2: Noise figure parameters – Electrical spectrum analyzer method

1 Scope and object

This part of IEC 61290 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 establish uniform requirements for accurate and reliable measurements, by means of the electrical spectrum analyzer (ESA) method, of the noise figure, as defined in IEC 61291-1.

The present test method is based on direct electrical noise measurement and it is directly related to its definition including all relevant noise contributions. Therefore, this method can be used for all types of optical amplifiers, including SOA and Raman amplifiers which can have significant contributions besides amplified spontaneous emission, because it measures the total noise figure. For further details of applicability, see IEC 61290-3. An alternative test method based on the optical spectrum analyzer can be used, particularly for different noise parameters (such as the signal-spontaneous noise factor) but it is not included in the object of this standard.

NOTE 1 All numerical values followed by (‡) are suggested values for which the measurement is assured. Other values may be acceptable but should be verified.

NOTE 2 A measurement accuracy for the average noise factor of ± 20 % (‡), respectively ± 1 dB, should be attainable with this method (see Clause 6).

NOTE 3 General aspects of noise figure test methods are reported in IEC 61290-3.

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 60728-6, *Cable networks for television signals, sound signals and interactive services – Part 6: Optical equipment*

IEC 61290-3: *Optical fibre amplifiers – Basic specification – Part 3: Test methods for noise figure parameters*¹

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

NOTE A list of informative references is given in the bibliography.

¹ The first editions of some of these parts were published under the general title *Optical fibre amplifiers – Basic specification* or *Optical amplifiers – Test methods*. Future editions of these parts will appear under the new general title listed above. The individual titles of Parts 1-1, 3-1, 5-2, 10-1, 10-2, 10-3, 11-1 and 11-2 will be updated in future editions of these parts to reflect the overall structure of the series.