



SLOVENSKI STANDARD

SIST EN 61290-10-2:2008

01-april-2008

BUXca Yý U.

SIST EN 61290-10-2:2004

Cdh] b]c'U Yj Ub]]!'DfYg_i gbY'a YrcXY!'%\$!&'XY'. 'DUfUa Yff]'n'j Y ' _UbU]!
A YrcXUg'di `nca `df]i dcfUM]n_`f Yj UbY[Ucdh] bY[UgdY_fUUbY[UUbU]nUrcf'U
f197 `* %&- \$!%\$!& &\$ \$+L

Optical amplifiers - Test methods - Part 10-2: Multichannel parameters - Pulse method using a gated optical spectrum analyzer (IEC 61290-10-2:2007)

Prüfverfahren für Lichtwellenleiter-Verstärker - Teil 10-2: Mehrkanalparameter - Pulsmethode bei Verwendung eines ausblendbaren optischen Spektralanalysators (IEC 61290-10-2:2007)

SIST EN 61290-10-2:2008

Amplificateurs optiques - Méthodes d'essai - Partie 10-2: Paramètres à canaux multiples - Méthode d'impulsion utilisant un analyseur de spectre optique stroboscopique (CEI 61290-10-2:2007)

Ta slovenski standard je istoveten z: EN 61290-10-2:2008

ICS:

33.180.30

SIST EN 61290-10-2:2008

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61290-10-2:2008

<https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008>

English version

**Optical amplifiers -
Test methods -
Part 10-2: Multichannel parameters -
Pulse method using a gated optical spectrum analyzer
(IEC 61290-10-2:2007)**

Amplificateurs optiques -
Méthodes d'essai -
Partie 10-2: Paramètres
à canaux multiples -
Méthode d'impulsion utilisant un analyseur
de spectre optique stroboscopique
(CEI 61290-10-2:2007)

Prüfverfahren für
Lichtwellenleiter-Verstärker -
Teil 10-2: Mehrkanalparameter -
Pulsmethode bei Verwendung
eines ausblendbaren optischen
Spektralanalysators
(IEC 61290-10-2:2007)

(standards.iteh.ai)

SIST EN 61290-10-2:2008

<https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f>

This European Standard was approved by CENELEC on 2007-10-01. 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/772/FDIS, future edition 2 of IEC 61290-10-2, 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 61290-10-2 on 2007-10-01.

This European Standard supersedes EN 61290-10-2:2003.

EN 61290-10-2:2008 is a technical revision with updated references and cautions on proper use of the procedure.

This standard is to be used in conjunction with 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) 2008-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-10-01

The International Electrotechnical Commission (IEC) and CENELEC draw attention to the fact that it is claimed that compliance with this document may involve the use of two patents.

One patent concerns a technique for determining the amplified spontaneous emission noise of an optical amplifier in the presence of an optical signal given in Clause 4 and Clause 6.

The IEC and CENELEC take no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the IEC. Information may be obtained from:

Agilent Technologies
Palo Alto (CA)
USA

Another patent concerns a measurement system and noise measurement apparatus for an optical amplifier given in Clause 4 and Clause 6.

The IEC and CENELEC take no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the IEC. Information may be obtained from:

Fujitsu Limited
Tokyo
Japan

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. The IEC and CENELEC shall not be held responsible for identifying any or all such patent rights.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61290-10-2:2007 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 61290-3-1:2003 (not modified).
IEC 61290-10-1	NOTE	Harmonized as EN 61290-10-1:2003 (not modified).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61290-10-2:2008](https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008)

<https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008>

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 61291-1	- ¹⁾	Optical amplifiers - Part 1: Generic specification	EN 61291-1	2006 ²⁾

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 61290-10-2:2008](https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008)

<https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008>

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Optical amplifiers – Test methods –
Part 10-2: Multichannel parameters – Pulse method using a gated optical
spectrum analyzer**

**Amplificateurs optiques – Méthodes d'essai –
Partie 10-2: Paramètres à canaux multiples – Méthode d'impulsion utilisant un
analyseur de spectre optique stroboscopique**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

N

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope and object.....	6
2 Normative references	6
3 Symbols and abbreviated terms.....	7
4 Apparatus.....	7
5 Test sample.....	10
6 Procedure	10
6.1 General.....	10
6.2 Calibration.....	10
6.3 Output signal and noise measurement.....	10
7 Calculations	11
8 Test results	12
Annex A (informative) Pulse repetition frequency measurements	13
Bibliography.....	14
Figure 1 – Test apparatus for signal-spontaneous noise figure parameter measurement – Typical arrangement	8
Figure 2a – Optically switched source module	8
Figure 2b – Directly modulated source module.....	9
Figure 2 – Two arrangements of the optical pulse source module	9
Figure 3 – Timing diagram	11
Figure A.1 – Set-up to evaluate gain recovery error versus modulation rate.....	13
Figure A.2 – Gain recovery error versus modulation frequency with pump current as a parameter	13

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Figure 1 – Test apparatus for signal-spontaneous noise figure parameter measurement
– Typical arrangement SIST EN 61290-10-2:2008 8
https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-5e1b4e0e671/sist-en-61290-10-2-2008
Figure 2a – Optically switched source module 8
Figure 2b – Directly modulated source module..... 9
Figure 2 – Two arrangements of the optical pulse source module 9
Figure 3 – Timing diagram 11
Figure A.1 – Set-up to evaluate gain recovery error versus modulation rate..... 13
Figure A.2 – Gain recovery error versus modulation frequency with pump current as a
parameter 13

INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL AMPLIFIERS – TEST METHODS –

**Part 10-2: Multichannel parameters –
Pulse method using a gated optical spectrum analyzer**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of two patents.

One patent concerns a technique for determining the amplified spontaneous emission noise of an optical amplifier in the presence of an optical signal given in Clause 4 and Clause 6.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the IEC. Information may be obtained from:

Agilent Technologies
Palo Alto (CA)
USA

Another patent concerns a measurement system and noise measurement apparatus for an optical amplifier given in Clause 4 and Clause 6.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the IEC. Information may be obtained from:

Fujitsu Limited
Tokyo
Japan

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61290-10-2 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2003. It is a technical revision with updated references and cautions on proper use of the procedure.

This standard is to be read in conjunction with IEC 61291-1.

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

FDIS	Report on voting
86C/772/FDIS	86C/787/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 of the IEC 61290 series, published under the general title *Optical amplifiers – Test methods*:¹⁾ can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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,
- withdrawn,
- replaced by a revised edition, or
- amended.

¹⁾ The first editions of some of these parts were published under the general title *Optical fibre amplifiers – Basic specification* or *Optical amplifier test methods*.

INTRODUCTION

As far as can be determined, this part of IEC 61290 is the first International Standard on this subject. The technology of optical amplifiers is still evolving, hence amendments and new editions to this document should 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 is given in Clause 3.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 61290-10-2:2008

<https://standards.iteh.ai/catalog/standards/sist/69747921-2882-4546-a30f-3e1f94e0e671/sist-en-61290-10-2-2008>