

**CdHj b]c'U Yj Ub]\_J'È'DfYg\_i ýUbY'a YrcXY'È'%'\$!( "XY.'JY \_UbUg\_]dUfUa Yff]È  
 A YrcXUn'cXj nYa Ub^Ya `]bhYfde`]fUbY[ Uj]fUn'i dcfUWc`UbU]nUrcf'UcdHj bY[ U  
 gdY\_fUf197 \*%&-\$!%\$!(. &\$ \$+Ł**

Optical amplifiers - Test methods -- Part 10-4: Multichannel parameters - Interpolated source subtraction method using an optical spectrum analyzer (IEC 61290-10-4:2007)

Prüfverfahren für Lichtwellenleiter-Verstärker - Teil 10-4: Mehrkanal-Parameter - Quellen-Interpolations- und Subtraktionsverfahren unter Verwendung eines optischen Spektralanalysators (IEC 61290-10-4:2007)

Amplificateurs optiques - Méthodes d'essais -- Partie 10-4: Paramètres a canaux multiples - Méthode par soustraction de la source interpolée en utilisant un analyseur de spectre optique (IEC 61290-10-4:2007)

**Ta slovenski standard je istoveten z: EN 61290-10-4:2007**

**ICS:**

33.180.30 U] cã } ã ð æ ^ ç ð } ã ã Optic amplifiers

**SIST EN 61290-10-4:2007 en,fr,de**

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

SIST EN 61290-10-4:2007

<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>

English version

**Optical amplifiers -  
Test methods -  
Part 10-4: Multichannel parameters -  
Interpolated source subtraction method  
using an optical spectrum analyzer  
(IEC 61290-10-4:2007)**

Amplificateurs optiques -  
Méthodes d'essais -  
Partie 10-4: Paramètres  
à canaux multiples -  
Méthode par soustraction  
de la source interpolée en utilisant  
un analyseur de spectre optique  
(CEI 61290-10-4:2007)

Prüfverfahren  
für Lichtwellenleiter-Verstärker -  
Teil 10-4: Mehrkanal-Parameter -  
Quellen-Interpolations- und  
Subtraktionsverfahren  
unter Verwendung eines  
optischen Spektralanalysators  
(IEC 61290-10-4:2007)

[SIST EN 61290-10-4:2007](https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007)

<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>

This European Standard was approved by CENELEC on 2007-06-01. 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/724/CDV, future edition 1 of IEC 61290-10-4, prepared by SC 86C, Fibre optic systems and active devices, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel Unique Acceptance Procedure and was approved by CENELEC as EN 61290-10-4 on 2007-06-01.

This standard is to be used in conjunction with EN 61291-1:2006.

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) 2008-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-06-01

Annex ZA has been added by CENELEC.

---

## Endorsement notice

The text of the International Standard IEC 61290-10-4:2007 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 61290-1-1 NOTE Harmonized as EN 61290-1-1:2006 (not modified).

IEC 61290-3 NOTE Harmonized as EN 61290-3:2000 (not modified).

<https://standards.iteh.ai/catalog/standards/sist/051c5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>  
 SIST EN 61290-10-4:2007

**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	2006	Optical amplifiers - Part 1: Generic specification	EN 61291-1	2006
IEC 61291-4	- <sup>1)</sup>	Optical amplifiers - Part 4: Multichannel applications - Performance specification template	EN 61291-4	2003 <sup>2)</sup>

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

[SIST EN 61290-10-4:2007](https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007)  
<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>

---

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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

SIST EN 61290-10-4:2007

<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>

INTERNATIONAL  
STANDARD

IEC  
CEI

NORME  
INTERNATIONALE

61290-10-4

First edition  
Première édition  
2007-05

---

---

**Optical amplifiers –  
Test methods –**

**Part 10-4:  
Multichannel parameters –  
Interpolated source subtraction method  
using an optical spectrum analyzer**

**Amplificateurs optiques –  
Méthodes d'essais –**

**Partie 10-4:  
Paramètres à canaux multiples –  
Méthode par soustraction de la source interpolée  
en utilisant un analyseur de spectre optique**



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE  
CODE PRIX

Q

*For price, see current catalogue  
Pour prix, voir catalogue en vigueur*

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope and object.....	6
2 Normative references .....	6
3 Abbreviated terms .....	7
4 Apparatus.....	7
5 Test sample.....	8
6 Procedure .....	9
6.1 Calibration.....	9
6.1.1 Calibration of optical bandwidth.....	9
6.1.2 Calibration of OSA power correction factor .....	10
6.2 Measurement .....	11
6.3 Calculation .....	12
7 Test results .....	12
Annex A (normative) Limitations of the interpolated source subtraction technique due to source spontaneous emission .....	13
<p><b>(standards.iteh.ai)</b></p>	
Bibliography.....	17
<p><a href="https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64015cd75510/sist-cip-61290-10-4-2007">SIST EN 61290-10-4:2007</a></p>	
Figure 1 – Apparatus for gain and noise figure measurement.....	7
Figure A.1 – DI subtraction error as a function of source spontaneous emission level.....	14
Figure A.2 – Spectral plot showing additive higher noise level from spontaneous emission of individual laser sources and broadband multiplexer.....	16
Figure A.3 – Significantly reduced spontaneous emission using wavelength selective multiplexer.....	16



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**OPTICAL AMPLIFIERS –  
TEST METHODS –**
**Part 10-4: Multichannel parameters –  
Interpolated source subtraction method using  
an 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.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61290-10-4 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This standard shall be used in conjunction with IEC 61291-1. It was established on the basis of the second (2006) edition of that standard.

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

CDV	Report on voting
86C/724/CDV	86C/742/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 of 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 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.

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

[SIST EN 61290-10-4:2007](https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007)

<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>

## INTRODUCTION

This International Standard 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.

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

[SIST EN 61290-10-4:2007](https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007)

<https://standards.iteh.ai/catalog/standards/sist/03fc5642-59bc-4c75-9e6f-64613ed73516/sist-en-61290-10-4-2007>