IEC 61290-4-1

Edition 2.0 2016-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Optical amplifiers – Test methods – Part 4-1: Gain transient parameters – Two-wavelength method

Amplificateurs optiques – Méthodes d'essai – Partie 4-1: Paramètres de gain transitoire – Méthode à deux longueurs d'onde

IEC 61290-4-1:2016-09(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.180.30

ISBN 978-2-8322-3659-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61290-4-1 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 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) extended the applicability from only EDFAs to all OFAs;
b) updated definitions for consistency with other documents in the IEC 61290-4 series.

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

CDV	Report on voting
86C/1347/CDV	86C/1397/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document 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 stability date indicated on the IEC website 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- withdrawn,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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 61290-4 is devoted to optical amplifiers (OAs). The technology of OAs is quite new and still emerging; hence amendments and new editions to this document can be expected.

Background information on the transient phenomenon in erbium-doped fibre amplifiers and the consequences on fibre optic systems is provided in Annex A and on slew rate effects in Annex B.

OPTICAL AMPLIFIERS – TEST METHODS –

Part 4-1: Gain transient parameters – Two-wavelength method

1 Scope

This part of IEC 61290-4 applies to optical amplifiers (OAs) using active fibres (optical fibre amplifiers (OFAs)) containing rare-earth dopants including erbium-doped fibre amplifiers (EDFAs) and optically amplified elementary sub-systems. These amplifiers are commercially available and widely deployed in service provider networks.

The object of document is to provide the general background for OFA transients and related parameters, and to describe a standard test method for accurate and reliable measurement of the following transient parameters:

a) channel addition or removal transient gain overshoot and transient net gain overshoot;

b) channel addition or removal transient gain undershoot and transient net gain undershoot;

c) channel addition or removal gain offset;

d) channel addition or removal transient gain response time constant (settling time).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61291-1, *Optical amplifiers – Part 1: Generic specification*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61291-1 and the following apply.

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- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
surviving channel
optical signal that remains after a drop event

3.1.2
rise time
time it takes for the input optical signal to rise from 10 % to 90 % of the total difference between the initial and final signal levels during an add event