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TECHNICAL REPORT

colour inside

Optical amplifiers –
Part 9: Semiconductor optical amplifiers (SOAs)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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IEC/TR 61292-9, which is a technical report, has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
86C/1148/DTR	86C/1183/RVC

Full information on the voting for the approval of this technical report 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 in the IEC 61292 series, published under the general title *Optical amplifiers*, 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 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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

Optical amplifiers (OAs) are necessary components as booster, line and pre-amplifiers for current optical network systems. IEC TC86/SC86C, has published many standards for OAs and most of them are focused on optical fibre amplifiers (OFAs), which are commonly deployed in commercial optical network systems. Recently, semiconductor optical amplifiers (SOAs) have attracted attention for applications in gigabit passive optical network (GPON) and 100 Gbit Ethernet (GbE) systems. This is because SOA chips are as small as laser diodes (LDs) and only require an electrical current.

Although SOAs for the 1 310 nm or 1 550 nm bands have been extensively studied since the 1980s, the use of SOAs is still limited to laboratories or field trials. This is due to specific performance features of SOAs such as gain ripple and polarization dependent gain (PDG). Thus, there are very few IEC standards addressing SOAs. One example is IEC/TR 61292-3, which is a technical report for classification, characteristics and applications of OAs including SOAs. However, it only deals with general information on SOAs and does not contain the detail information on test methods that are necessary to measure precisely the particular parameters of SOAs.

This technical report provides a better understanding of specific features of SOAs as well as information on measuring gain and PDG. It is anticipated that future standards will address performance and test methodology.

OPTICAL AMPLIFIERS –

Part 9: Semiconductor optical amplifiers (SOAs)

1 Scope

IEC/TR 61292-9, which is a technical report, focuses on SOAs, especially the specific features and measurement of gain and PDG.

In this report, only the amplifying application of SOAs is described.

Other applications, such as modulation, switching and non-linear functions, are not covered.

Potential applications of SOAs, however, such as reflective SOAs (RSOAs) for the seeded wavelength division multiplexing passive optical network (WDM-PON), are briefly reviewed in Annex A.