BS EN 62149-9:2014

BSI Standards Publication

Fibre optic active components and devices — Performance standards

Part 9: Seeded reflective semiconductor optical amplifier transceivers

National foreword

This British Standard is the UK implementation of EN 62149-9:2014. It is identical to IEC 62149-9:2014.

The UK participation in its preparation was entrusted by Technical Committee GEL/86, Fibre optics, to Subcommittee GEL/86/3, Fibre optic systems and active devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Fibre optic active components and devices - Performance standards - Part 9: Seeded reflective semiconductor optical amplifier transceivers (IEC 62149-9:2014)

Composants et dispositifs actifs à fibres optiques - Normes de performances - Partie 9: Émetteurs-récepteurs amplificateurs optiques à semiconducteurs réfléchissants répartis (CEI 62149-9:2014)

Aktive Lichtwellenleiterbauelemente und geräte - Betriebsverhalten - Teil 9: Injizierte reflektierende optische Halbleiterverstärker-Sende- und Empfangsmodule (IEC 62149-9:2014)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 86C/1145/CDV, future edition 1 of IEC 62149-9, 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 approved by CENELEC as EN 62149-9:2014.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-02-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-05-29

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The text of the International Standard IEC 62149-9:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60191 (all parts)	NOTE	Harmonized as EN 60191 (all parts).
IEC 60747-5-1	NOTE	Harmonized as EN 60747-5-1.
IEC 60749 (all parts)	NOTE	Harmonized as EN 60749 (all parts).
IEC 60825 (all parts)	NOTE	Harmonized as EN 60825 (all parts).
IEC 60874 (all parts)	NOTE	Harmonized as EN 60874 (all parts).
IEC 61290-1-3	NOTE	Harmonized as EN 61290-1-3.
IEC 62007-1	NOTE	Harmonized as EN 62007-1.
IEC 62007-2	NOTE	Harmonized as EN 62007-2.
IEC 62148-1	NOTE	Harmonized as EN 62148-1.
IEC 62149-1	NOTE	Harmonized as EN 62149-1.
IEC 62149-4	NOTE	Harmonized as EN 62149-4.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-6	-	Environmental testing -- Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-20	-	Environmental testing -- Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN 60068-2-20	-
IEC 60068-2-27	-	Environmental testing -- Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-38	-	Environmental testing -- Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test	EN 60068-2-38	-
IEC 60068-2-78	-	Environmental testing -- Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60749-25	-	Semiconductor devices - Mechanical and climatic test methods -- Part 25: Temperature cycling	EN 60749-25	-
IEC 60749-26	-	Semiconductor devices - Mechanical and climatic test methods -- Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)	EN 60749-26	-
IEC 60825-1	- [2)]	Safety of laser products -- Part 1: Equipment classification and requirements	EN 60825-1 [1)]	-
IEC 60950-1 (mod)	- [2)]	Information technology equipment - Safety -- Part 1: General requirements	EN 60950-1	2006 [3)]
			+A11	2009 [3)]
			+ A1	2010 [3)]
			+A12	2011 [3)]
			+AC	2011 [3)]
			+ A2	2013 [3)]
IEC 61300-2-47	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 2-47: Tests - Thermal shocks	EN 61300-2-47	-
IEC Guide 107	-	Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications	-	-
ITU-T Recommendation G.698.3	2012	Multichannel seeded DWDM applications with single channel optical interfaces		-

ITU-T Recommendation G.691	2006	Optical interface for single channel STM-64 and other SDH systems with optical amplifiers	-

[1)] prEN at date of issue.
[2)] Undated reference.
[3)] Valid edition at date of issue.

CONTENTS

INTRODUCTION

Fibre optic laser devices are used to convert electrical signals into optical signals. This part of IEC 62149 covers the performance specification for seeded reflective semiconductor optical amplifier (RSOA) transceivers in fibre optic telecommunication and optical data transmission applications. The optical performance criteria are generally well specified for a number of internationally agreed applications areas such as ITU-T Recommendation G.698.3. This standard aims to provide optical interface specifications toward the realization of transversely compatible seeded dense wavelength division multiplexing (DWDM) systems.

In seeded DWDM systems, seed light sources are used to generate broadband seed lights in C-band or L-band. After passing through DWDM DeMUXs in the link, the broadband seed lights are spectrum sliced according to the transmission characteristics of DWDM DeMUXs. To simplify link implementation, cyclic arrayed waveguide gratings (AWGs) are used as DWDM MUX/DeMUXs. A characteristic of the cyclic AWG is the periodicity of the frequencies routed from the common port to a given output port. This periodicity is called the free spectral range (FSR). The FSR is commonly specified for a centre channel of the AWG. The connection between the DWDM MUX/DeMUX and RSOA transceiver is bidirectional. Each spectrum sliced seed light is injected to a RSOA based transceiver. Consequently, an output signal wavelength of the RSOA transceiver can be determined by a wavelength of an injected seed light.

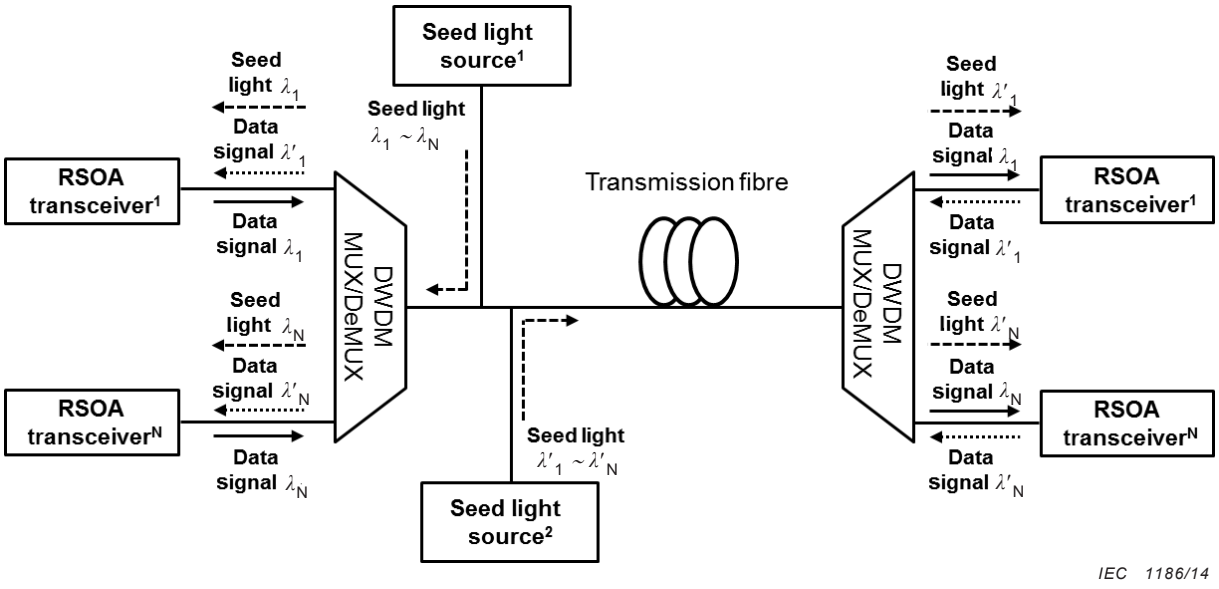

Figure 1 – Seeded DWDM transmission based on RSOA transceivers

Seeded RSOA transceivers for seeded DWDM systems are supplied by different manufacturers, but do not guarantee operation of seeded RSOA transceivers. Manufacturers using the standards are responsible for meeting the required performance and/or reliability and quality assurance under a recognized scheme.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 9: Seeded reflective semiconductor optical amplifier transceivers

1 Scope

This part of IEC 62149 covers the performance specification for seeded reflective semiconductor optical amplifier (RSOA) transceivers used for the fibre optic telecommunication and optical data transmission applications. The performance standard contains a definition of the product performance requirements together with a series of sets of tests and measurements with clearly defined conditions, severities, and pass/fail criteria. The tests are intended to be run on a "once-off" basis to prove any product's ability to satisfy the performance standard's requirements.

A product that has been shown to meet all the requirements of a performance standard can be declared as complying with the performance standard, but should then be controlled by a quality assurance/quality conformance program.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-38, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60749-25, *Semiconductor devices – Mechanical and climatic test methods – Part 25: Temperature cycling*

IEC 60749-26, *Semiconductor devices – Mechanical and climatic test methods – Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61300-2-47, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-47: Tests – Thermal shocks*