



NSAI
Standards

Irish Standard
I.S. EN 62149-7:2012

Fibre optic active components and devices - Performance standards -- Part 7: 1 310 nm discrete vertical cavity surface emitting laser devices (IEC 62149-7:2012 (EQV))

I.S. EN 62149-7:2012

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EUROPEAN STANDARD

EN 62149-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2012

ICS 33.180.20

English version

**Fibre optic active components and devices -
Performance standards -
Part 7: 1 310 nm discrete vertical cavity surface emitting laser devices
(IEC 62149-7:2012)**

Composants et dispositifs actifs
à fibres optiques -
Norme de performance -
Partie 7: Dispositifs discrets
à laser 1 310 nm émettant en surface
(CEI 62149-7:2012)

Aktive Lichtwellenleiterbauelemente
und -geräte -
Betriebsverhaltensnormen -
Teil 7: 1 310 nm oberflächenemittierender
Laser-Bauteile mit vertikalem Resonator
(IEC 62149-7:2012)

This European Standard was approved by CENELEC on 2012-05-03. 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.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86C/1021/CDV, future edition 1 of IEC 62149-7, prepared by IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62149-7:2012.

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) 2013-02-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-05-03

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60191 series	NOTE	Harmonized as EN 60191 series (not modified).
IEC 60747-5-1	NOTE	Harmonized as EN 60747-5-1.
IEC 60793-2	NOTE	Harmonized as EN 60793-2.
IEC 60874 series	NOTE	Harmonized as EN 60874 series (not modified).
IEC 61280-1-3	NOTE	Harmonized as EN 61280-1-3.
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 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 60749	Series	Semiconductor devices - Mechanical and climatic test methods	EN 60749	Series
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 60950-1	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 61300-2-4	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-4: Tests - Fibre/cable retention	EN 61300-2-4	-
IEC 61300-2-19	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-19: Tests - Damp heat (steady state)	EN 61300-2-19	-
IEC 61300-2-48	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-48: Tests - Temperature-humidity cycling	EN 61300-2-48	-
IEC 62148-15	-	Fibre optic active components and devices - Package and interface standards - Part 15: Discrete vertical cavity surface emitting laser packages	EN 62148-15	-
IEC Guide 107	1998	Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES –
PERFORMANCE STANDARDS –**
**Part 7: 1 310-nm discrete vertical cavity
surface emitting laser devices**

FOREWORD

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International Standard IEC 62149-7 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

CDV	Report on voting
86C/1021/CDV	86C/1047/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.

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A list of all the parts in the IEC 62149 series, published under the general title *Fibre optic active components and devices – Performance standards*, 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.

INTRODUCTION

Fibre optic laser devices are used to convert electrical signals into optical signals. This part of IEC 62149 covers the performance specification for 1 310 nm discrete vertical cavity surface emitting laser devices in fibre optic telecommunication and optical data transmission applications.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 7: 1 310-nm discrete vertical cavity surface emitting laser devices

1 Scope

This part of IEC 62149 covers the performance specification for 1 310-nm discrete vertical cavity surface emitting laser (VCSEL) devices of transverse single-mode and multimode types used for the fibre optic telecommunication and optical data transmission application in a form of the VCSEL chips mounted on a substrate with wire bonding to their chips' anode and cathode terminals without any fibre pigtails. 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 "one-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.

Depending on the signalling speed and application areas, subcategorized specifications of the 1 310-nm discrete VCSEL are defined as shown in Table 1.

Table 1 – Subcategorized specifications of the 1 310-nm discrete VCSEL

	1,0625 GBd	1,25 GBd	2,125 GBd	3,125 GBd	4,25 GBd	8,5 GBd	10 GBd ^a	16 GBd	25,78125 GBd
Fibre Channel	FC1GB		FC2GB		FC4GB	FC8GB		FC16GB _b	
Ethernet		E1A1a E1A1b E1B		E3A1a E3A1b E10BLX4			E10BLR E10BLW E40BLR4		E25B ^c
NOTE Bd is baud rate; A1a is 50 µm core multimode fibre; A1b is 62, 5 µm core multimode fibre; B is single-mode fibre; LR is 10 G LAN; LW is 10 G WAN; LR4 is 40 G WDM. (Refer to IEC 60793-2, IEEE 802.3-2002, INCITS 450-2009, INCITS/Project 2118-D/Rev1.00-2008.09.25, IEEE 802.3-2005, and IEEE P802.3ba-2009.)									
^a Nominal signal rate of 10 G Ethernet is 10,312 5 GBd for E10BLR and E40BLR4 and 9,953 28 GBd for E10BLW.									
^{b, c} VCSEL specifications for signalling rates of 16 GBd, 25,781 25 GBd and above are left for future works.									

Each subcategorized specification is also defined by separate details depending on the device types, such as specifications for a VCSEL device without a monitor photodiode (Case a) and for a VCSEL device with a monitor photodiode (Case b).

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.

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