

# INTERNATIONAL STANDARD

**Fibre optic active components and devices – Package and interface standards –  
Part 15: Discrete vertical cavity surface emitting laser packages**

IEC 62148-15:2009

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**Fibre optic active components and devices – Package and interface standards –  
Part 15: Discrete vertical cavity surface emitting laser packages**

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FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES –  
PACKAGE AND INTERFACE STANDARDS –

Part 15: Discrete vertical cavity surface emitting laser packages

FOREWORD

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International Standard IEC 62148-15 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This standard is to be read in conjunction with IEC 62148-1.

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

FDIS	Report on voting
86C/928/FDIS	86C/934/RVD

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 62148 series, published under the general title *Fibre optic active components and devices – Package and interface standards*, 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- withdrawn,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
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## INTRODUCTION

Fibre optic laser devices are used to convert electrical signals into optical signals. This standard covers the physical dimension and interface for the discrete vertical cavity surface emitting laser (VCSEL) packages.

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# FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PACKAGE AND INTERFACE STANDARDS –

## Part 15: Discrete vertical cavity surface emitting laser packages

### 1 Scope and object

This part of IEC 62148 covers the physical dimension and interface specifications for the discrete vertical cavity surface emitting laser (VCSEL) devices in optical telecommunication and optical data transmission applications.

The object of this standard is to adequately specify the physical requirements of VCSEL devices that will enable mechanical interchangeability of laser devices or transmitters complying with this standard both at the printed circuit wiring board and for any panel-mounting requirement.

### 2 Normative references

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.

IEC 60793-2 (all parts), *Optical fibres – Part 2: Product specifications*

IEC 60874 (all parts), *Connectors for optical fibres and cables*

IEC 61754 (all parts), *Fibre optic connector interfaces*

IEC 61754-20, *Fibre optic connector interfaces – Part 20: Type LC connector family*

IEC 61754-4-1, *Fibre optic connector interfaces – Part 4-1: Type SC connector family – Simplified receptacle SC-PC connector interfaces*

IEC 62148-1, *Fibre optic active components and devices – Package and interface standards – Part 1: General and guidance*

ITU-T Recommendation G.652: *Characteristics of a single-mode optical fibre and cable*

### 3 Terms, definitions and abbreviations

For the purposes of this document, the following terms, definitions and abbreviations apply.

#### 3.1 Terms and definitions

##### 3.2

##### **pigtail package**

package type of photonic devices, which has a length of fibre attachment for both optical input and output ports

#### 3.3 Abbreviations

VCSEL            vertical cavity surface emitting laser

PD	photodiode
TOSA	transmitter optical subassembly
TO	transistor outline
CAN	airtight sealed metal container (IEC 60747-1:2006)

## 4 Classification

This part of IEC 62148, which gives the physical dimension and interface specifications for the discrete vertical cavity surface emitting laser devices, specifies the interface of types 1 and 3 modules with direct solderable type electrical terminals.

Fibre optic transceiver modules are classified into 5 types of forms according to the combination of mating types of electrical and optical interfaces. Details are described in IEC 62148-1. The 5 types are as follows:

- Type 1: fibre optic connector interface with direct solderable type electrical terminals.
- Type 2: fibre optic connector interface with plug-in type electrical terminals.
- Type 3: fibre optic pigtail interface with direct solderable type electrical terminals.
- Type 4: fibre optic pigtail interface with plug-in type electrical terminals.
- Type 5: modules are not classified into type 1 – type 4. (A typical example is a module that has both electrical connectors and non-connector type terminals as an electrical interface, such as a coaxial connector for signal and lead terminals for the power supply.)

## 5 Specification of the optical interface

### 5.1 General

The purpose of this standard is to adequately specify the physical requirements of a VCSEL device that will enable mechanical interchangeability of laser devices or transmitters to this specification both at the printed circuit board and for any panel mounting requirement.

### 5.2 Optical connector interface (type 1)

This standard applies to LC and SC optical connector interfaces. Detailed dimensions of the optical receptacle are specified in IEC 61754-20 and IEC 61754-4-1.

### 5.3 Pigtail interface (type 3)

All optical fibres defined in IEC 60793-2 series and ITU-T Recommendation G.652 are applicable.

All optical connectors defined in IEC 60874 series are applicable, if a pigtail is to be terminated with an optical connector.

## 6 Specifications of electrical interfaces

### 6.1 General

Specifications for the electrical interface of VCSEL TO CAN, TOSA and VCSEL pigtail packages are described as follows.

## 6.2 Electrical interface specifications for VCSEL TO CAN packages

### 6.2.1 General

The electrical interface in this standard defines only the basic functionality of each pin.

### 6.2.2 Numbering of electrical terminals

Pin numbering assignments are shown in Figure 1 (electrical terminals viewed from the bottom of the package module with pins underneath).

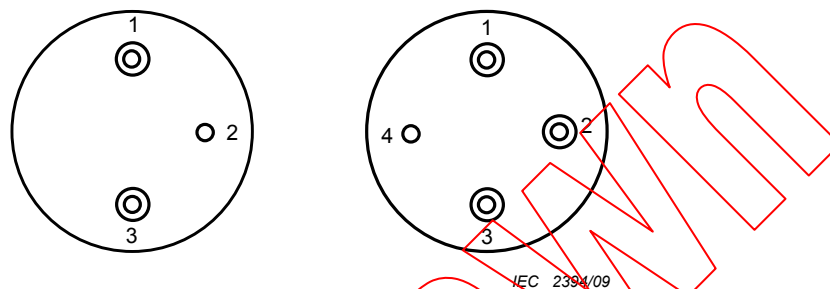


Figure 1 – Electrical terminal numbering assignments of 3-pin and 4-pin types TO CAN packages (viewed from bottom with pins)

### 6.2.3 Electrical terminals assignment

Table 1 – Pin-function definitions of the 4-pin type VCSEL TO CAN packages

Pin number	Function (VCSEL with a monitor photodiode)		
	Common cathode	Common anode	Float
1	VCSEL anode	VCSEL cathode	VCSEL anode
2	VCSEL cathode / PD anode	VCSEL anode / PD cathode	VCSEL cathode
3	PD cathode	PD anode	PD cathode
4	Ground / case (option)	Ground / case (option)	PD anode / Case