

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Fibre optic active components and devices – Package and interface standards –  
Part 11: 14-pin modulator integrated laser diode modules and pump laser diode  
modules**

**Composants et dispositifs actifs fibroniques – Normes de boîtier et d'interface –  
Partie 11: Modules à diodes laser à modulateur intégré de 14 broches et à diodes  
laser de pompage de 14 broches**

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8327-0086-0

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# CONTENTS

FOREWORD..... 3

INTRODUCTION..... 5

1 Scope..... 6

2 Normative references ..... 6

3 Terms, definitions and abbreviated terms ..... 6

    3.1 Terms and definitions..... 6

    3.2 Abbreviated terms..... 6

4 Classification..... 6

5 Specifications ..... 7

    5.1 14-pin modulator integrated laser diode modules ..... 7

        5.1.1 Pigtail interface..... 7

        5.1.2 Electrical interface ..... 7

        5.1.3 Mechanical interface..... 8

        5.1.4 Case outline ..... 8

    5.2 14-pin pump laser diode modules..... 9

        5.2.1 Pigtail interface..... 9

        5.2.2 Electrical interface ..... 9

        5.2.3 Mechanical interface..... 10

        5.2.4 Case outline ..... 10

Bibliography..... 11

Figure 1 – Electrical terminal numbering assignments (viewed from the top of the module) ..... 7

Figure 2 – Case outline for 14-pin modulator integrated laser diode modules..... 8

Figure 3 – Electrical terminal numbering assignments (viewed from the top of the module) ..... 9

Figure 4 – Case outline for 14-pin pump laser diode modules ..... 10

Table 1 – Pin-function definitions for modulator integrated laser diode modules..... 7

Table 2 – Pin function definitions for pump laser diode modules ..... 9

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES –  
PACKAGE AND INTERFACE STANDARDS –****Part 11: 14-pin modulator integrated laser diode modules and  
pump laser diode modules**

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This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

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

- a) change of the document title to better reflect the type of modules covered by this document;
- b) separation of the electrical and mechanical interface specifications for modulator integrated laser diode modules and for pump laser diode modules into independent subclauses;

- c) updates of the dimensions specified in Figure 4 to reflect the latest market situation;
- d) removal of former subclause 6.3 ("Drawings of footprint").

The text of this International Standard is based on the following documents:

Draft	Report on voting
86C/1925/CDV	86C/1948/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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## INTRODUCTION

Modulator integrated laser diode modules are used to convert electrical signals into optical signals. Pump laser diode modules are used to supply optical pump power in rare earth doped optical fibre amplifiers and Raman amplifiers. This document covers the physical interface for modulator integrated laser diode modules and pump laser diode modules. These modules are designed as pigtailed 14-pin packages with a thermo-electric cooler.

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

## Part 11: 14-pin modulator integrated laser diode modules and pump laser diode modules

### 1 Scope

This part of IEC 62148 covers physical interface specifications for 14-pin modulator integrated laser diode transmitter modules and for 14-pin pump laser diode modules.

This document specifies the physical requirements of modulator integrated laser diode modules and pump laser diode modules to enable mechanical interchangeability of modules complying with this document, both at the printed circuit board level and with respect to panel mounting requirements.

### 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 61754 (all parts), *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces*

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

### 3 Terms, definitions and abbreviated terms

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62148-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

#### 3.2 Abbreviated terms

PD photodiode

TEC thermo-electric cooler

### 4 Classification

The modulator integrated laser diode modules described in this document are classified as Type 3 according to the definitions of IEC 62148-1. There is no corresponding classification for the pump laser diode modules described in this document.



## 5 Specifications

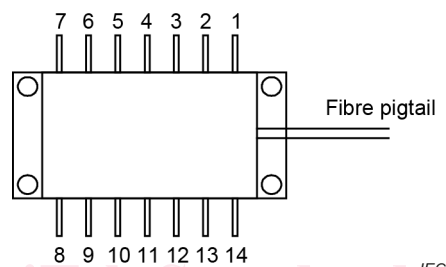
### 5.1 14-pin modulator integrated laser diode modules

#### 5.1.1 Pigtail interface

The optical fibre used in the pigtail should be one of the fibre types specified in IEC 60793-2-50. If a pigtail is to be terminated with an optical connector, the connector shall be one of the optical connectors specified in the IEC 61754 series.

#### 5.1.2 Electrical interface

The electrical interface in this document defines only the basic functionality of each pin. Pin numbering assignments are shown in Figure 1 (electrical terminals viewed from the top of the module).



**Figure 1 – Electrical terminal numbering assignments (viewed from the top of the module)**

The basic functionalities of the 14 pins of the modulator integrated laser diode module are defined in Table 1.

**Table 1 – Pin-function definitions for modulator integrated laser diode modules**

Pin number	Symbol	Functional description
1 <sup>a</sup>		Thermistor-1
2 <sup>a</sup>		Thermistor-2
3	LD <sub>A</sub>	Laser diode anode
4	PD <sub>A</sub>	Monitor PD anode
5	PD <sub>K</sub>	Monitor PD cathode
6	TEC <sub>A</sub>	Thermo-electric cooler anode
7	TEC <sub>K</sub>	Thermo-electric cooler cathode
8		Case ground
9		Case ground
10		Not connected or case ground
11		Laser and modulator ground
12		Modulator anode RF data input
13		Laser and modulator ground
14		Not connected or case ground

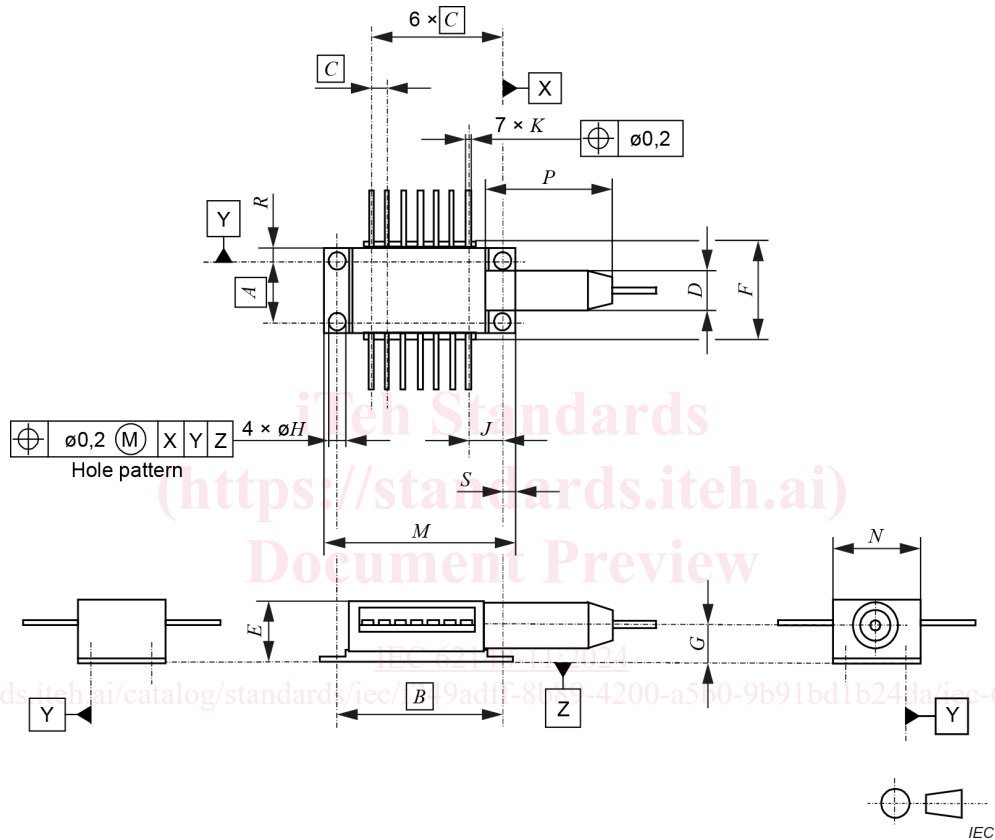
<sup>a</sup> Resistance between these two terminals indicates the case temperature.

**5.1.3 Mechanical interface**

The modulator integrated laser diode module should be mounted according to the recommendations or specifications provided by the module's manufacturer or supplier. When a heatsink is required to operate the module, the mounting conditions for attaching the heatsink should be specified (e.g. required screws and tightening torque).

**5.1.4 Case outline**

The case outline and corresponding dimensions for the modulator integrated laser diode module are shown in Figure 2.



References	Dimensions mm		Remarks
	Minimum	Maximum	
A	8,9		Basic dimension
B	26,0		Basic dimension
C	2,54		Pitch of the 7 pins on both sides
D		6,7	The minimum dimension should be specified by the manufacturer or supplier
E		10,0	The minimum dimension should be specified by the manufacturer or supplier
F	12,9	15,5	
G	4,6	5,8	
H	2,5	2,8	Diameter
J	5,2	5,6	
K	0,3	0,7	
M	29,2	30,2	
N	12,3	12,9	
P			Minimum and maximum dimensions should be specified by the manufacturer or supplier
R	1,5	2,2	
S	1,4	2,3	

**Figure 2 – Case outline for 14-pin modulator integrated laser diode modules**