IEC 62148-18

Edition 1.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic active components and devices – Package and interface standards – Part 18: 40-Gbit/s serial transmitter and receiver components for use with the LC connector interface

Composants et dispositifs actifs fibroniques – Normes de boîtier et d'interface – Partie 18: Composants émetteurs et récepteurs série à 40 Gbit/s à utiliser avec l'interface de connecteur LC

IEC 62148-18:2014-11(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 18: 40-Gbit/s serial transmitter and receiver components for use with the LC connector interface

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International Standard IEC 62148-18 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/1227/CDV	86C/1273/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.

A list of all parts in 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 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- withdrawn,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

Compact optical sub-assembly (OSA) modules for 40 Gbit/s are used to convert electrical signals into optical signals and vice-versa. This part of IEC 62148 covers the physical interface for 40-Gbit/s compact OSA modules. These modules are designed for use with the LC fibre optic connector specified in IEC 61754-20, and are intended to be applied to 40 Gbit/s or higher bit rate transceivers.

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

Part 18: 40-Gbit/s serial transmitter and receiver components for use with the LC connector interface

1 Scope

This part of IEC 62148 covers the 40-Gbit/s serial physical interface specification of transmitter and receiver components for use with the LC connector interface.

The purpose of this standard is to adequately specify the physical requirements of optical transmitters and receivers that will enable mechanical interchangeability of transmitters and receivers complying with this standard both at the PCB level and for any panel-mounting requirement.

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

IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*

3 Terms, definitions and abbreviations

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

3.1 Terms and definitions

3.1.1
TOSA module
optical module that converts electrical signals into optical signals and that is connected to an optical fibre

3.1.2
ROSA module
optical module that converts optical signals into electrical signals and that is connected to an optical fibre

3.2 Abbreviations

DML	directly modulated laser diode
EmwL	external modulator with laser diode
FPC	flexible printed circuit
LD	laser diode
OSA	optical sub-assembly

PCB printed circuit board
PD photodiode
ROSA receiver optical sub-assembly
TOSA transmitter optical sub-assembly

4 Electromagnetic compatibility (EMC) requirements

The components specified in this part of IEC 62148 shall comply with suitable requirements for electromagnetic compatibility (in terms of both, emission and immunity), depending on the particular usage/environment in which they are intended to be installed or integrated. Guidance to the drafting of such EMC requirements is provided in IEC Guide 107. Guidance for electrostatic discharge (ESD) is still under study.

5 Classification

The transmitter and receiver components for the LC connector described in this standard are classified as type 1 according to the definitions of IEC 62148-1.

6 Specification of 40-Gbit/s serial transmitter component for LC connectors without thermo-electric cooler

6.1 General

This clause specifies the physical requirements of a TOSA module that will enable mechanical interchangeability of modules complying with this standard, both for the PCB and for any panel mounting requirement. The vendor should design the FPC by considering electrical crosstalk and mechanical stress.

6.2 Electrical interface

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. Package potential shall be specified by each vendor.

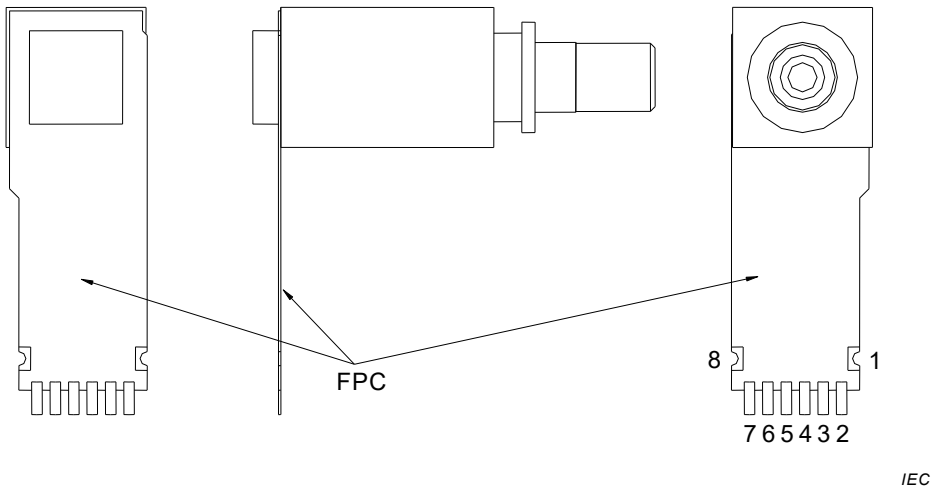


Figure 1 – Electrical terminal numbering assignments

6.2.3 Electrical terminal assignment

Electrical terminal assignment and terminal function definitions are shown in Figure 2 and Table 1, respectively.

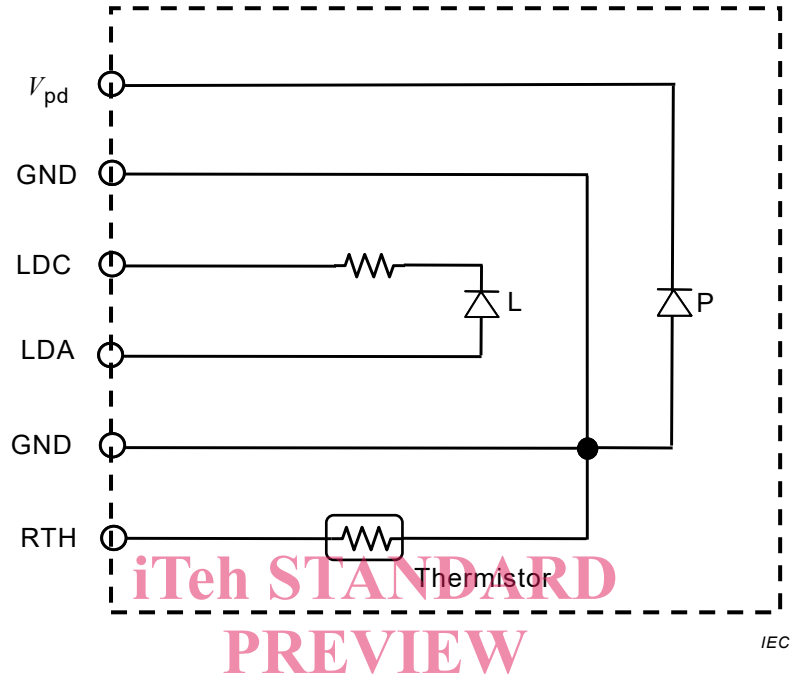


Figure 2a – Option A

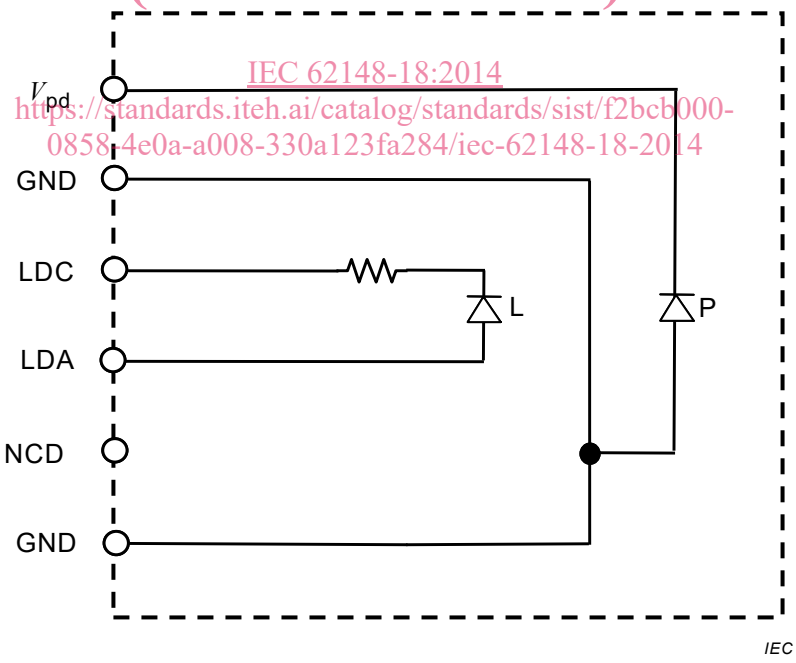


Figure 2b – Option B

NOTE 1 The dashed line denotes an electrical interface of the transmitter component and does not mean electrical connection.

NOTE 2 A thermistor is optional.

Figure 2 – Block diagram

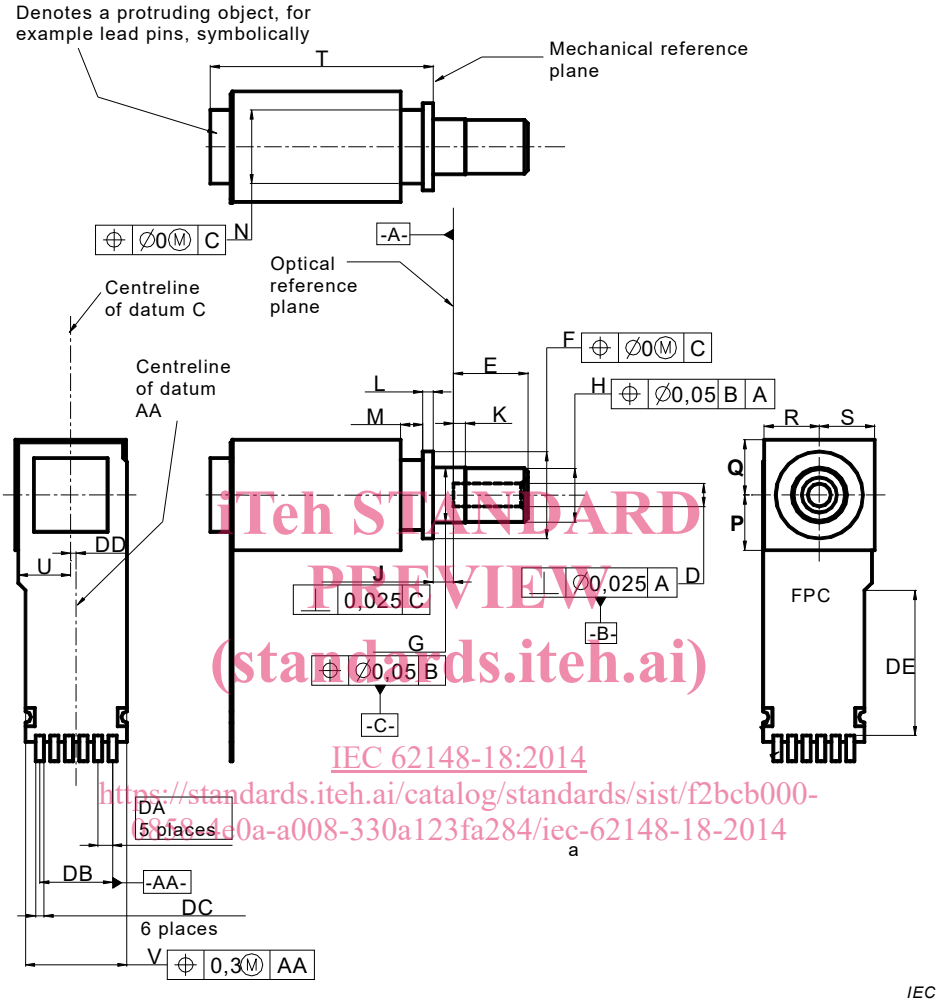
Table 1 – Terminal function definitions

Terminal number	Symbol	Function
Option A		
1	GND	Signal ground
2	V_{pd}	PD cathode
3	GND	Signal ground
4	LDC	LD cathode
5	LDA	LD anode
6	GND	Signal ground
7	RTH	thermistor
8	GND	Signal ground
Option B		
1	GND	Signal ground
2	V_{pd}	PD cathode
3	GND	Signal ground
4	LDC	LD cathode
5	LDA	LD anode
6	GND	Signal ground
7	NC	No user connection
8	GND	Signal ground

6.3 Outline and footprint

6.3.1 Drawing of package outline

Drawing and dimensions of the package outline are shown in Figure 3 and Table 2, respectively.



[a] Denotes 8 soldering pads corresponding to the terminals described in Figure 1 and Table 1. Features and dimensions of the pads and the FPC end portion shape around the pads shall be specified by each vendor to comply with the recommended pattern layout described in Figure 4. The features of the pads and the FPC end portion shape described in this figure are prepared as examples only.

Figure 3 – Package outline drawing

Table 2 – Dimensions of the package outline

Reference	Dimensions mm		Notes
	Minimum	Maximum	
D	–	–	Note 1
E	4,0	4,1	
F	4,7	5,1	Diameter
G	2,98	3,00	Diameter
H	–	2,97	Diameter
J	1,065	1,135	
K	0,55	0,70	
L	0,52	0,63	
M	1,0	–	
N	–	4,1	Diameter
P	–	3	Note 2
Q	–	3	Note 2
R	–	3	Note 2
S	–	3	Note 2
T	–	13,8	
U	–	3	Note 3 [a]
V	–	5,7	[a]
DA	0,79		Basic dimension [a]
DB	3,95		Reference dimension [a]
DC	–	–	[b]
DD	0,05	0,55	Note 4 [a]
DE	2,5	–	[a]

NOTE 1 Refer to IEC 61754-20.

NOTE 2 P, Q, R and S define only the maximum dimension; they do not specify the shape of the package.

NOTE 3 Denotes the outline dimension of the FPC from datum C.

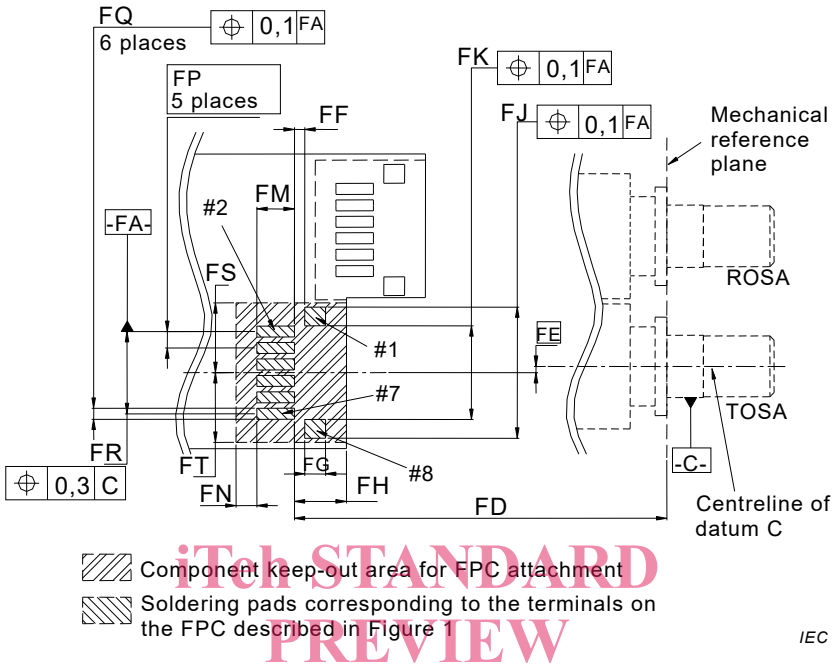
NOTE 4 Denotes the dimension from the centreline of datum C to the centreline of datum AA.

[a] The dimensions defined in this table shall be satisfied even if a vendor chooses a different FPC attachment structure or a different FPC end portion shape from those described in Figure 3.

[b] The dimension and the positional tolerance of DC shall be specified by each vendor, considering the pattern layout described in Figure 4.

6.3.2 Drawing of footprint

The recommended pattern layout for the PCB and its dimensions are shown in Figure 4 and Table 3, respectively.



NOTE 1 Datum C described here is the same as described in Figure 3.

NOTE 2 #1, #2, #7 and #8 in this figure denote pad numbers corresponding to the terminal numbers described in Figure 1 and Table 1.

Figure 4 – Recommended pattern layout for the PCB