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**Fibre optic active components and devices – Package and interface standards –
Part 2: SFF 10-pin transceivers**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2: SFF 10-pin transceivers

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62148-2 edition 2.1 contains the second edition (2010-12) [documents 86C/975/FDIS and 86C/981/RVD] and its amendment 1 (2024-11) [documents 86C/1922/CDV and 86C/1939/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62148-2 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision.

With respect to the previous edition, this edition includes 10-pin SFF-LC, and SFF MU devices.

It also cancels and replaces the first edition of IEC 62148-7 and the first edition of IEC 62148-9.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62148 series can be found, under the general title *Fibre optic active components and devices – Package and interface standards*, on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Fibre optic transceivers are used to convert electrical signals into optical signals and vice versa. This standard covers the physical interface for a 10-pin small form factor (SFF) transceiver. This transceiver is designed for use with the SFF MU/MT-RJ/LC duplex optical connector and with through-hole printed circuit-board applications.

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

Part 2: SFF 10-pin transceivers

1 Scope

This part of IEC 62148 covers the physical interface specifications for the SFF MT-RJ/LC/MU duplex 10-pin fibre optic transceiver module family.

The intent of this standard is to adequately specify the physical requirements of an optical transceiver that will enable mechanical interchangeability of transceivers 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 61754-6, *Fibre optic connector interfaces – Part 6: Type MU connector family*

IEC 61754-18, *Fibre optic connector interfaces – Part 18: Type MT-RJ connector family*

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

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

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

small form factor optical transceiver

a compact optical digital signal transceiver whose package has the same cross sectional outline as the receptacle of an electrical connector compliant with the IEC 60603-7 series

3.2 Abbreviations

SFF small form factor

4 Classification

The transceiver described in this standard is classified as type 1 according to IEC 62148-1.

5 Specification of the optical connector interface

This standard applies to the MT-RJ/LC/MU duplex optical connector interface. Detailed dimensions of the optical receptacle are provided in Clause 7.

Assignment of the optical transmit and receive ports is aligned to the electrical pins. One-half of the module is the transmit side and the other is the receive side. Assignments are shown in Figure 1.

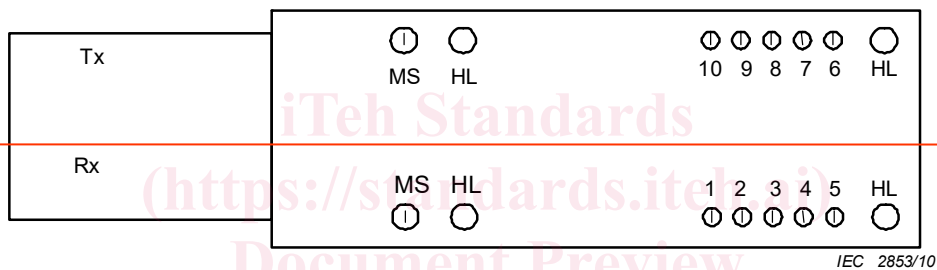
6 Electrical interface

6.1 General

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

6.2 Numbering of electrical terminals

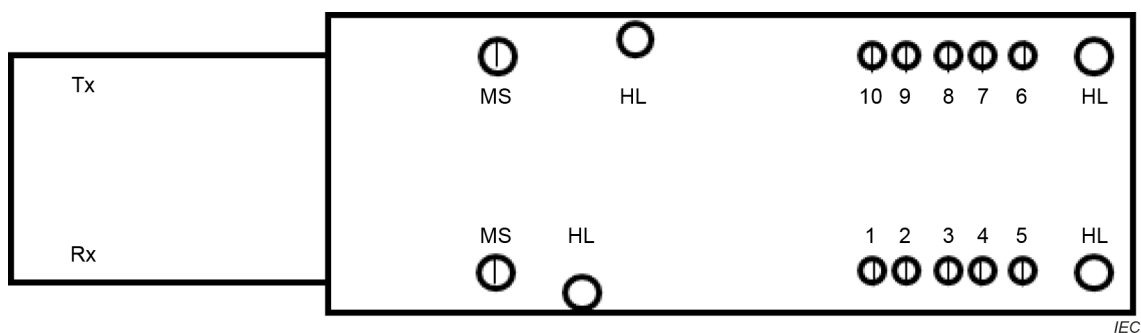
Pin numbering assignments are shown in Figure 1 (viewed from the top of the module with pins underneath).



Key

Rx: receiver section

Tx: transmitter section



Key

HL housing leads

MS mounting studs

Rx receiver section

Tx transmitter section

**Figure 1 – Electrical terminal numbering assignments
 (viewed from above with pins underneath)**

6.3 Electrical terminal assignment

Table 1 – Transceiver receiver pin-function definitions

10-pin part	Symbol	Functional description
MS ^a	MS	Mounting studs The mounting studs are provided for transceiver mechanical attachment to the circuit board. They may also provide an optional connection of the transceiver to the equipment chassis ground
HL	HL	Housing leads The optional transceiver housing leads may be provided for additional signal grounding. These additional grounds may improve signal integrity, EMC or EMI performance
1	Vee _r	Receiver signal ground
2	Vcc _r	Receiver power supply
3	SD	Signal detect
4	RD-	Received data out bar
5	RD+	Received data out
^a The holes in the circuit board shall be tied to the chassis ground.		

Table 2 – Transceiver transmitter pin-function definitions

10-pin part	Symbol	Functional description
MS ^a	MS	Mounting studs The mounting studs are provided for transceiver mechanical attachment to the circuit board. They may also provide an optional connection of the transceiver to the equipment chassis ground
HL	HL	Housing leads The optional transceiver housing leads may be provided for additional signal grounding. These additional grounds may improve signal integrity, EMC or EMI performance
6	Vcc _t	Transmitter power supply
7	Vee _t	Transmitter signal ground
8 ^b	TDis	Transmitter disable: optional feature
9	TD+	Transmitter data in
10	TD-	Transmitter data in bar
^a The holes in the circuit board shall be tied to the chassis ground.		
^b Optional use for laser-based products only.		

7 Outline and footprint

7.1 Drawings of case outline

Drawings of the case outline as well as the dimensions are given in Figures 2, 3 and 4.

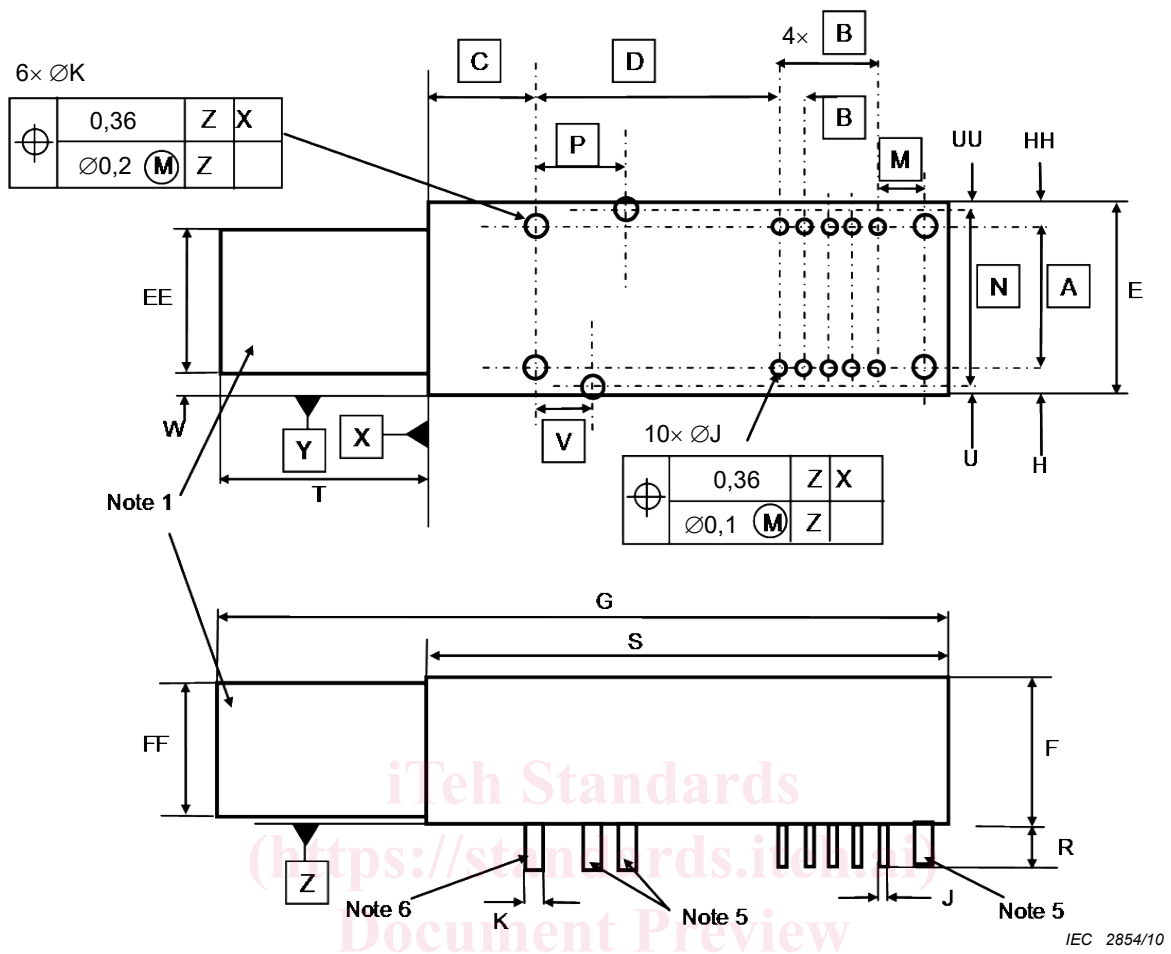


Figure 2 – Case outline of the SFF MT-RJ 10-pin transceiver