BS EN 62148-17:2014

BSI Standards Publication

Fibre optic active components and devices — Package and interface standards

Part 17: Transmitter and receiver components with dual coaxial RF connectors

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National foreword

This British Standard is the UK implementation of EN 62148-17:2014. It is identical to IEC 62148-17:2013.

The UK participation in its preparation was entrusted by Technical Committee GEL/86, Fibre optics, to Subcommittee GEL/86/3, Fibre optic systems and active devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2014

ISBN 978 0 580 75320 6
ICS 33.180.99

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2014.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62148-17

March 2014

ICS 33.180.99

English version

Fiber optic active components and devices - Package and interface standards - Part 17: Transmitter and receiver components with dual coaxial RF connectors

(IEC 62148-17:2013)

Composants et dispositifs actifs à fibres optiques – Normes de boitiers et d'interface – Partie 17: Composants émetteurs et récepteurs munis de connecteurs coaxiaux RF doubles
(CEI 62148-17:2013)

Aktive Lichtwellenleiterbauelemente und -geräte – Gehäuse- und Schnittstellennormen – Teil 17: Sende- und Empfangsbauteile mit dualen HF-Koaxialsteckverbindern
(IEC 62148-17:2013)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86C/1165/FDIS, future edition 1 of IEC 62148-17, prepared by SC 86C, "Fibre optic systems and active devices", of IEC TC 86, "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62148-17:2014.

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)	2014-09-21
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-10-30

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

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The text of the International Standard IEC 62148-17:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60191 (all parts)	NOTE	Harmonized as EN 60191 (all parts).
IEC 60825-1	NOTE	Harmonized as EN 60825-1.
IEC 60825-2	NOTE	Harmonized as EN 60825-2.
IEC 61281-1	NOTE	Harmonized as EN 61281-1.
IEC 62007-1	NOTE	Harmonized as EN 62007-1.
IEC 62007-2	NOTE	Harmonized as EN 62007-2.
ISO 1101	NOTE	Harmonized as EN ISO 1101.

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.

Publication	Year	Title	EN/HD	Year
IEC Guide 107		Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications	-	-
IEC 60793-2-50		Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN 60793-2-50	
IEC 60874-1		Fibre optic interconnecting devices and passive components - Connectors for optical fibres and cables - Part 1: Generic specification	EN 60874-1	
IEC 62148-1		Fibre optic active components and devices - Package and interface standards - Part 1: General and guidance	EN 62148-1	

CONTENTS

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

Part 17: Transmitter and receiver components with dual coaxial RF connectors

1 Scope

This part of IEC 62148 covers physical interface specification of transmitter and receiver components with dual coaxial RF connectors.

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 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60874-1, *Fibre optic interconnecting devices and passive components – Connectors for optical fibres and cables – Part 1: Generic specification*

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 Abbreviations

For the purposes of this document, the following abbreviations apply.

EMwL	External modulator with laser diode
LD	Laser diode
PD	Photo diode
PCB	Printed circuit board
PIN PD	Photo diode with PIN structure
SMPM	Sub-miniature push-on miniature
TEC	Thermo-electric cooler
TIA	Trans-impedance amplifier

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 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 with dual coaxial RF connectors described in this standard are classified as type 5 according to the definitions of IEC 62148-1.

6 Specification of transmitter component with dual coaxial RF connectors

6.1 General

The intention of this clause is to specify adequately the physical requirements of an optical transmitter component with an EMwL, a modulator driver IC, a TEC and dual coaxial RF input connectors. It will enable mechanical interchangeability of components complying with this specification both for the PCB and for any panel mounting requirement.

6.2 Pigtail interface

All optical fibres defined in IEC 60793-2-50 are applicable.

All optical connectors defined in IEC 60874-1 are applicable if a pigtail is to be terminated with an optical connector.

6.3 Electrical interface

6.3.1 General

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

6.3.2 Numbering of electrical terminals

Terminal numbering assignments are shown in Figure 1.

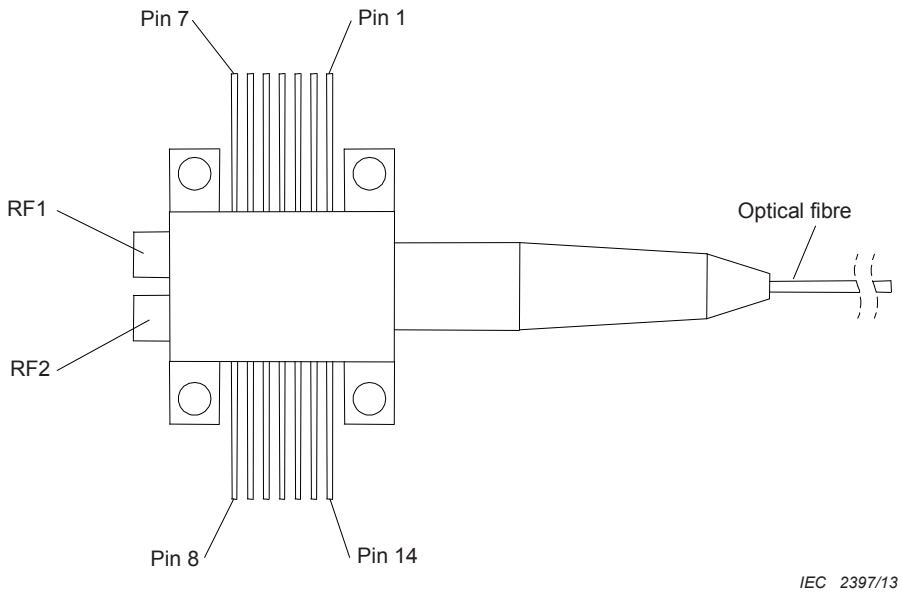
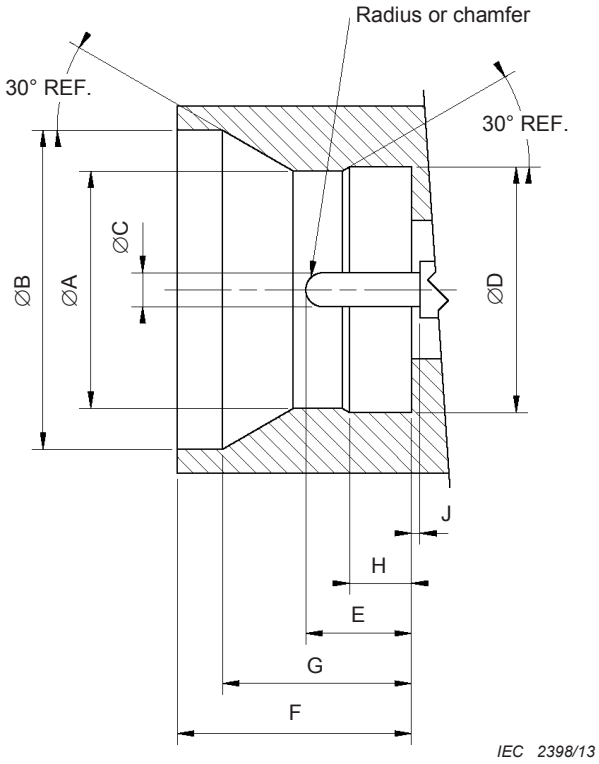


Figure 1 – Electrical terminal numbering assignments for transmitter component with dual coaxial RF connectors

6.3.3 Coaxial connector

The transmitter component has male type coaxial connectors as RF1 and RF2 terminals. The connector can handle RF electrical signals and is compatible with the SMPM connector, which is defined in Figure 2.

NOTE If the SMPM connector is standardized in IEC, the reference will be added in a future edition.



Reference	Dimensions mm	
	Minimum	Maximum
AΦ	2,11	2,16
BΦ	2,82	2,92
CΦ	0,28	0,33
DΦ	2,18	2,24
E	0,76	1,14
F	2,08	2,13
G	1,57	1,83
H	0,53	0,58
J	0,00	–

Figure 2 – Coaxial RF connector interface

6.3.4 Electrical terminal assignment

The basic functionalities of each electrical terminal for transmitter components are defined in Table 1.

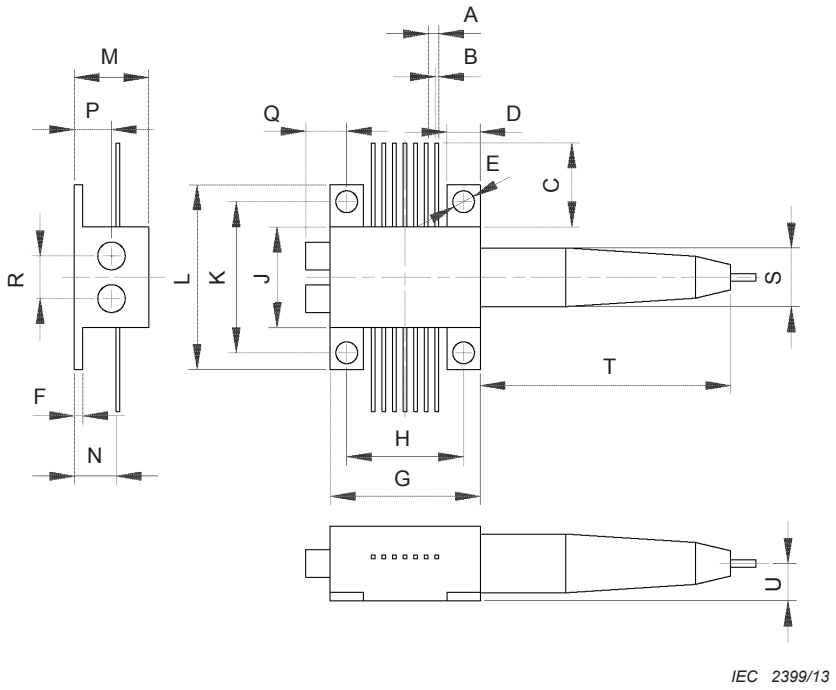
Table 1 – Terminal function definitions

Terminal number	Symbol	Function
1	LDA	LD anode
2	PDA	PD anode
3	V_b	Modulator bias
4	V_m	Modulator modulation
5	V_{ss}	Driver IC supply voltage
6	V_x	Cross point control voltage
7	–	Vendor option
8	–	Vendor option
9	–	Vendor option
10	GND	Case ground
11	–	Vendor option (reserved for thermistor)
12	RTH	Thermistor
13	TEC (–)	TEC cathode
14	TEC (+)	TEC anode
RF1	IN or INB	RF input
RF2	INB or IN	RF input
NOTE TEC acts as an EMwL chip-cooler in the bias direction described here. When it is biased reversely, its function is changed into heating.		
Polarity of RF outputs shall be defined by each vendor.		

6.4 Package outline and footprint

6.4.1 Drawing of package outline

A drawing of the package outline as well as the dimensions is given in Figure 3.

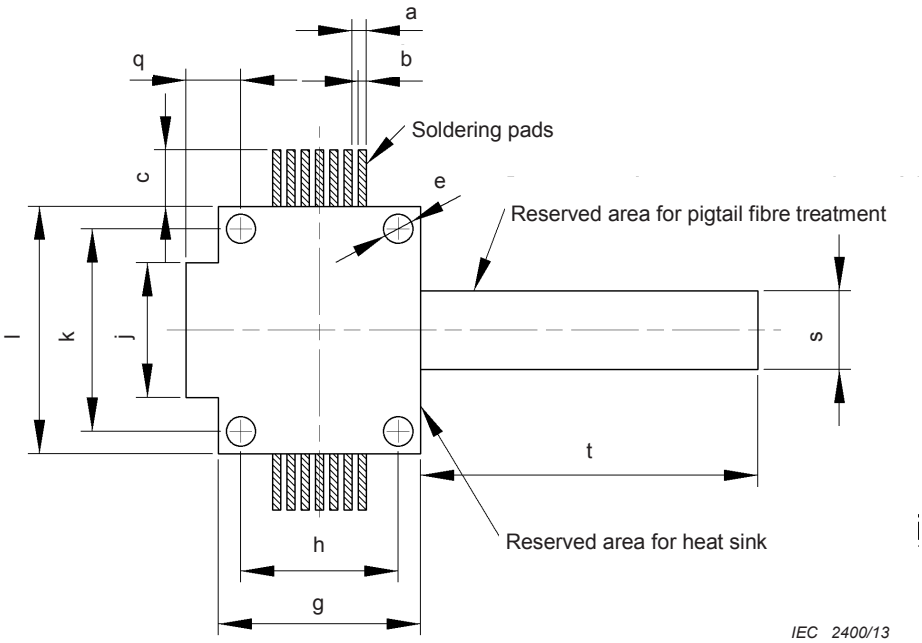


Reference	Dimensions mm		Notes
	Minimum	Maximum	
A	1,27		Basic dimension
B	–	0,45	
C	10,0	–	
D	3,75	4,25	
E	2,6		Diameter, basic dimension
F	–	1,0	
G	17,75	18,25	
H	13,9	14,1	
J	11,75	12,25	
K	17,9	18,1	
L	21,75	22,25	
M	–	8,9	
N	4,6	5,0	
P	4,45		Basic dimension
Q	4,65	5,15	(Typical 4,9 mm)
R	5,08		Basic dimension
S	–	7,0	Diameter
T	–	30	
U	4,45		Basic dimension

Figure 3 – Package outline drawing

6.4.2 Drawing of footprint

A drawing of the case footprint as well as the dimensions is given in Figure 4.



Reference	Dimensions mm		Notes
	Minimum	Maximum	
a	1,27		Basic dimension
b	0,45	–	
c	–	–	Specified by each vendor
e	2,6		Hole diameter, basic dimension
g	18,25	–	
h	14		Basic dimension
j	12,25	–	
k	18		Basic dimension
l	22,25	–	
q	5,15	–	
s	7,0	–	
t	30	–	

Figure 4 – Recommended pattern layout for the PCB

7 Specification of receiver component with dual coaxial RF connectors

7.1 General

The intention of this clause is to specify adequately the physical requirements of an optical receiver component with a PIN PD, TIA IC and dual coaxial RF output connectors. It will enable mechanical interchangeability of components complying with this specification both for the PCB and for any panel mounting requirement.

7.2 Pigtail interface

All optical fibres defined in IEC 60793-2-50 are applicable.

All optical connectors defined in IEC 60874-1 are applicable if a pigtail is to be terminated with an optical connector.

7.3 Electrical interface

7.3.1 General

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

7.3.2 Numbering of electrical terminals

Terminal numbering assignments are shown in Figure 5.

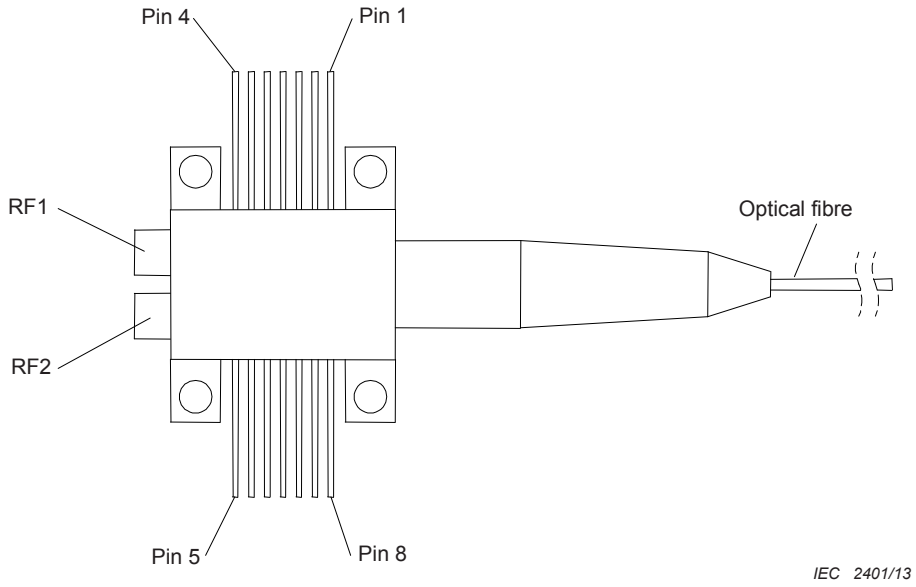


Figure 5 – Electrical terminal numbering assignments for receiver component with dual coaxial RF connectors

7.3.3 Coaxial connector

The receiver component has male type coaxial connectors as RF1 and RF2 terminals. The connectors can handle RF electrical signals and is compatible with the SMPM connector which is defined in Figure 2.

7.3.4 Electrical terminal assignment

The basic functionalities of each electrical terminal for receiver components are defined in Table 2. The polarity of RF outputs shall be defined by each vendor.

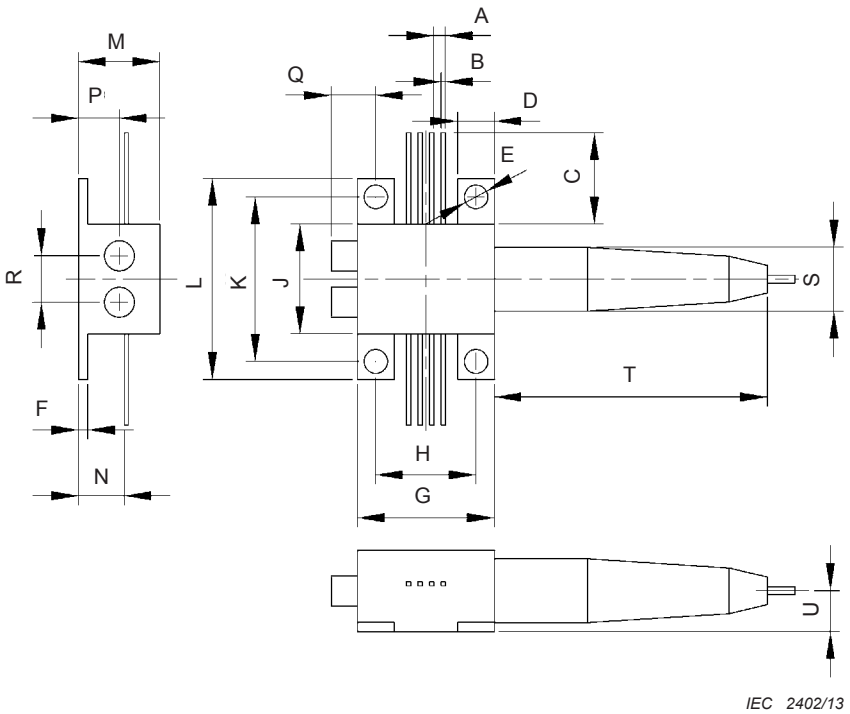
Table 2 – Terminal function definitions

Terminal number	Symbol	Function
1	V_{pd}	PD cathode
2	GND	Case ground
3	–	Vendor option
4	–	Vendor option
5	–	Vendor option
6	Vcc	TIA power supply voltage
7	GND	Case ground
8	(Rth)	Reserved for thermistor
RF1	OUT or OUTB	RF output
RF2	OUTB or OUT	RF output

7.4 Package outline and footprint

7.4.1 Drawing of package outline

A drawing of the package outline as well as the dimensions is given in Figure 6.



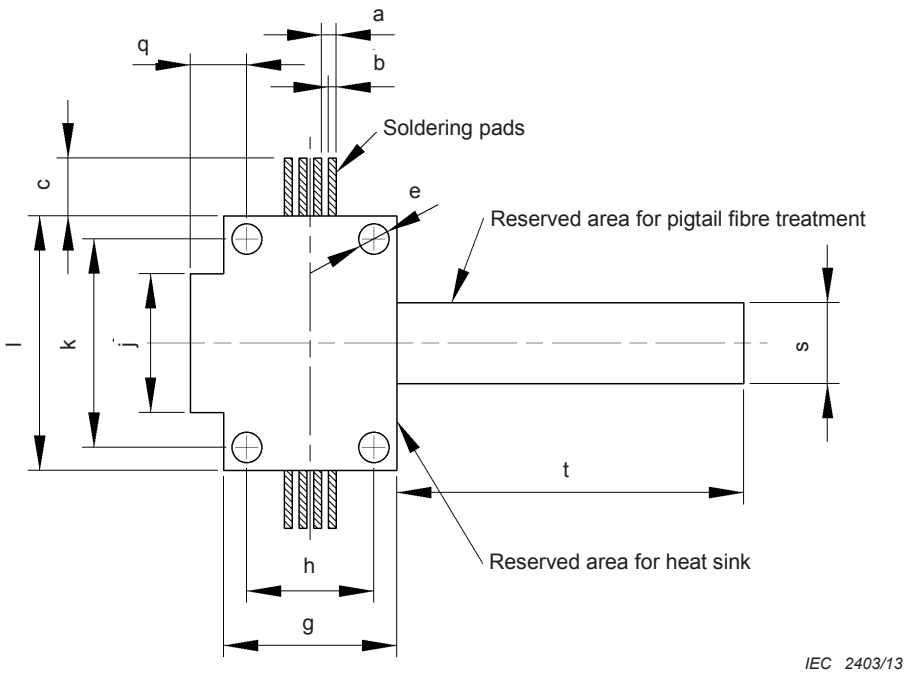
Reference	Dimensions mm		Notes
	Minimum	Maximum	
A	1,27		Basic dimension
B	–	0,45	
C	10,0	–	
D	3,75	4,25	
E	2,6		Diameter, basic dimension
F	–	1,0	

Reference	Dimensions mm		Notes
	Minimum	Maximum	
G	14,75	15,25	
H	10,9	11,1	
J	11,75	12,25	
K	17,9	18,1	
L	21,75	22,25	
M	–	8,9	
N	4,6	5,0	
P	4,45		Basic dimension
Q	4,65	5,15	(Typical 4,9 mm)
R	5,08		Basic dimension
S	–	7,0	Diameter
T	–	30	
U	4,45		Basic dimension

Figure 6 – Package outline

7.4.2 Drawing of footprint

A drawing of the case footprint as well as the dimensions is given in Figure 7.



Reference	Dimensions mm		Notes
	Minimum	Maximum	
a	1,27		Basic dimension
b	0,45	–	
c	–	–	Specified by each vendor
e	2,6		Hole diameter, basic dimension

g	15,25	–	
h	11		Basic dimension
j	12,25	–	
k	18		Basic dimension
l	22,25	–	
q	5,15	–	
s	7,0	–	
t	30	–	

Figure 7 – Recommended pattern layout for the PCB

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IEC 61281-1, *Fibre optic communication subsystems – Part 1: Generic specification*

IEC 62007-1, *Semiconductor optoelectronic devices for fibre optic system applications – Part 1: Specification template for essential ratings and characteristics*

IEC 62007-2, *Semiconductor optoelectronic devices for fibre optic system applications – Part 2: Measuring methods*

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