BS EN 62148-2:2011

BSI Standards Publication

Fibre optic active components and devices — Package and interface standards

Part 2: SFF 10-pin transceivers

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This British Standard is the UK implementation of EN 62148-2:2011. It is identical to IEC 62148-2:2010. It supersedes BS EN 62148-2:2003, BS EN 62148-7:2003, and BS EN 62148-9:2003, which are withdrawn.

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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English version

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

(IEC 62148-2:2010)

Composants et dispositifs actifs en fibres optiques -
Normes de boîtier et d'interface -
Partie 2: Emetteurs-récepteurs SFF à 10 broches
(CEI 62148-2:2010)

Aktive Lichtwellenleiterbauelemente und -geräte -
Gehäuse- und Schnittstellennormen -
Teil 2: Sende- und Empfangsmodule des Typs kleine Bauform (SFF) mit 10 Anschlüssen
(IEC 62148-2:2010)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 86C/975/FDIS, future edition 2 of IEC 62148-2, 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 was approved by CENELEC as EN 62148-2 on 2011-01-10.

This European Standard supersedes EN 62148-2:2003, EN 62148-7:2003 and EN 62148-9:2003.

With respect to EN 62148-2:2003, this EN 62148-2:2011 includes 10-pin SFF-LC, and SFF MU devices.

This standard should 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. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-10-10
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-01-10

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62148-2:2010 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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 61754-6-1	-	Fibre optic connector interfaces - Part 6-1: Type MU connector family - Simplified receptacle MU-PC connector interfaces	EN 61754-6-1	-
IEC 61754-18	-	Fibre optic connector interfaces - Part 18: Type MT-RJ connector family	EN 61754-18	-
IEC 61754-20	-	Fibre optic connector interfaces - Part 20: Type LC connector family	EN 61754-20	-
IEC 62148-1	-	Fibre optic active components and devices - Package and interface standards - Part 1: General and guidance	EN 62148-1	-

CONTENTS

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.

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.

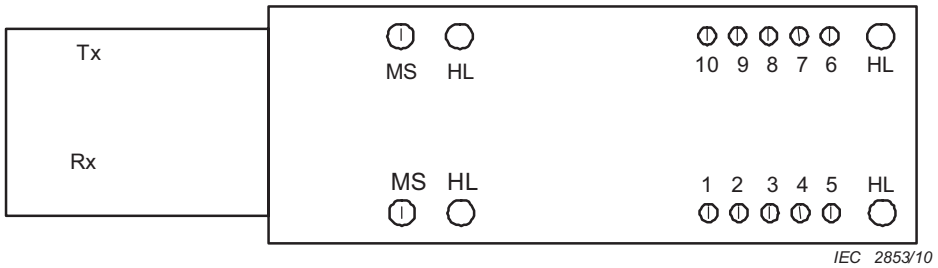
6 Electrical interface

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

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.

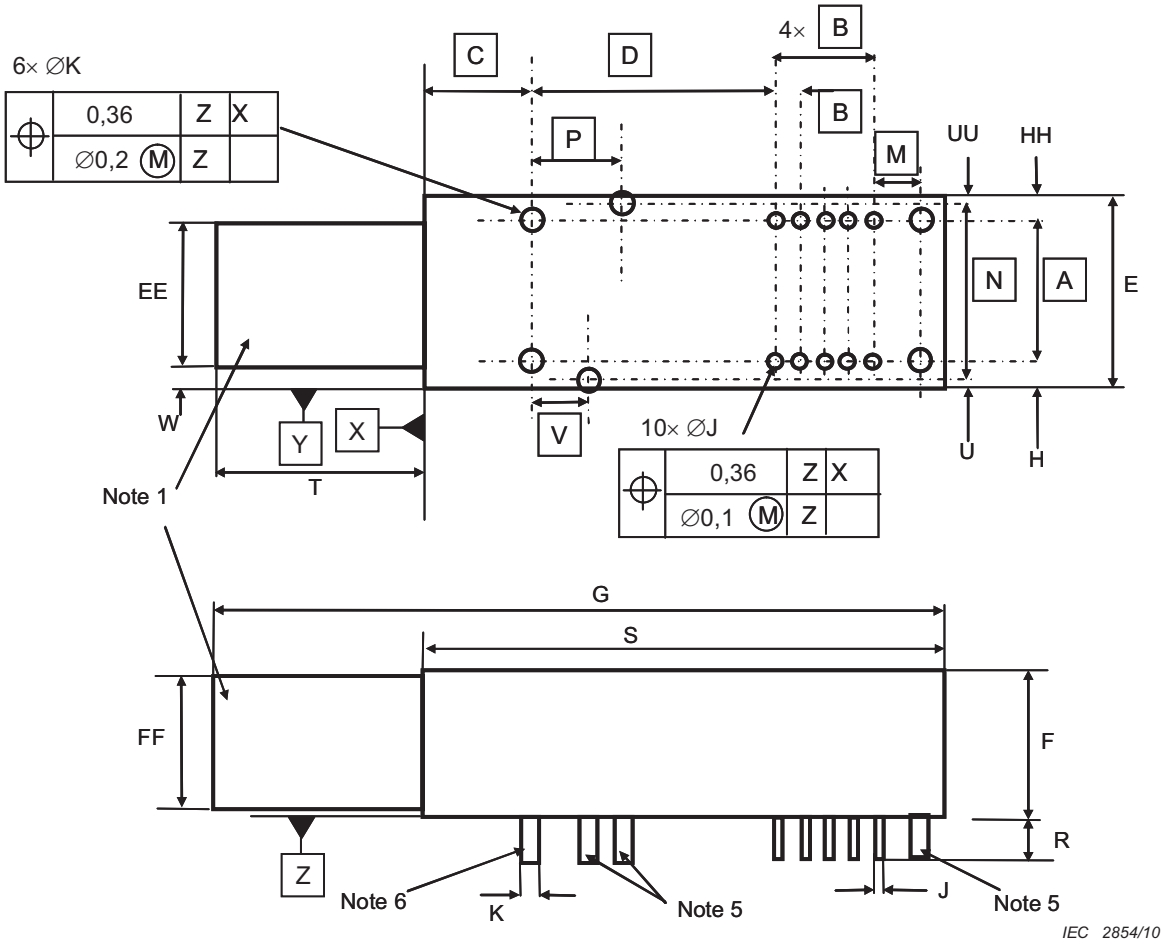


Figure 2 – Case outline of the SFF MT-RJ 10-pin transceiver

Table 3 – Key to Figure 2

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A	10,16		Basic dimension
B	1,78		Basic dimension
C	7,59		Basic dimension
D	17,78		Basic dimension
E		13,59	
F		9,80	
G		49,56	Reference dimension
H		1,90	See Note 7
J	0,41	0,61	Diameter in case of rod pins (See Note 3)
K	0,97	1,07	Diameter in case of rod pins (See Note 4)
M	3,56		Basic dimension
N	13,34		Basic dimension
P	7,11		Basic dimension
R	2,92		
S		37,56	
T		12,00	
U		0,30	See Note 8
V	4,57		Basic dimension
W	1,70	2,30	
EE		9,60	
FF		9,30	
HH		1,90	See Note 7
UU		0,30	See Note 8

NOTE 1 Defines the space available for the MT-RJ optical receptacle.

NOTE 2 All 16 pins and posts are to be treated as a single pattern.

NOTE 3 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “J”.

NOTE 4 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “K”.

NOTE 5 Four housing leads are additional signal grounds to enhance the tolerance of Electromagnetic immunity and Electromagnetic compatibility.

NOTE 6 Two mounting studs are recommended to be tied to the chassis ground.

NOTE 7 H+HH is less than 3,63.

NOTE 8 U+UU is less than 0,45.

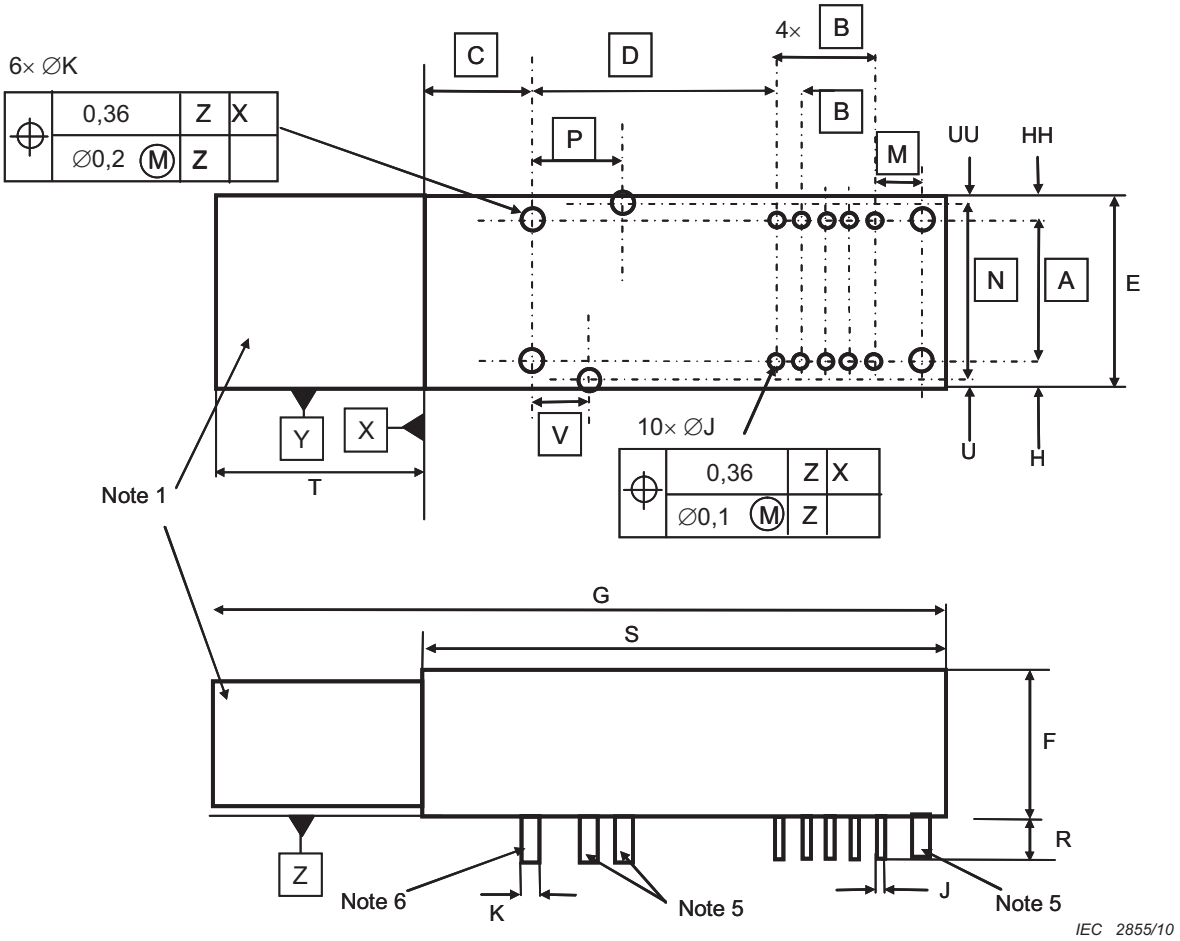


Figure 3 – Case outline of the SFF LC 10-pin transceiver

Table 4 – Key to Figure 3

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A	10,16		Basic dimension
B	1,78		Basic dimension
C	7,59		Basic dimension
D	17,78		Basic dimension
E		13,59	
F		9,80	
G		49,56	Reference dimension
H		1,90	See Note 7
J	0,41	0,61	Diameter in case of rod pins (See Note 3)
K	0,97	1,07	Diameter in case of rod pins (See Note 4)
M	3,56		Basic dimension
N	13,34		Basic dimension
P	7,11		Basic dimension
R	2,92		
S		37,56	
T		12,00	
U		0,30	See Note 8
V	4,57		Basic dimension
HH		1,90	See Note 7
UU		0,30	See Note 8

NOTE 1 Defines the space available for the LC optical receptacle.

NOTE 2 All 16 pins and posts are to be treated as a single pattern.

NOTE 3 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “J”.

NOTE 4 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “K”.

NOTE 5 Four housing leads are additional signal grounds to enhance the tolerance of Electromagnetic immunity and Electromagnetic compatibility.

NOTE 6 Two mounting studs are recommended to be tied to the chassis ground.

NOTE 7 H+HH is less than 3,63.

NOTE 8 U+UU is less than 0,45.

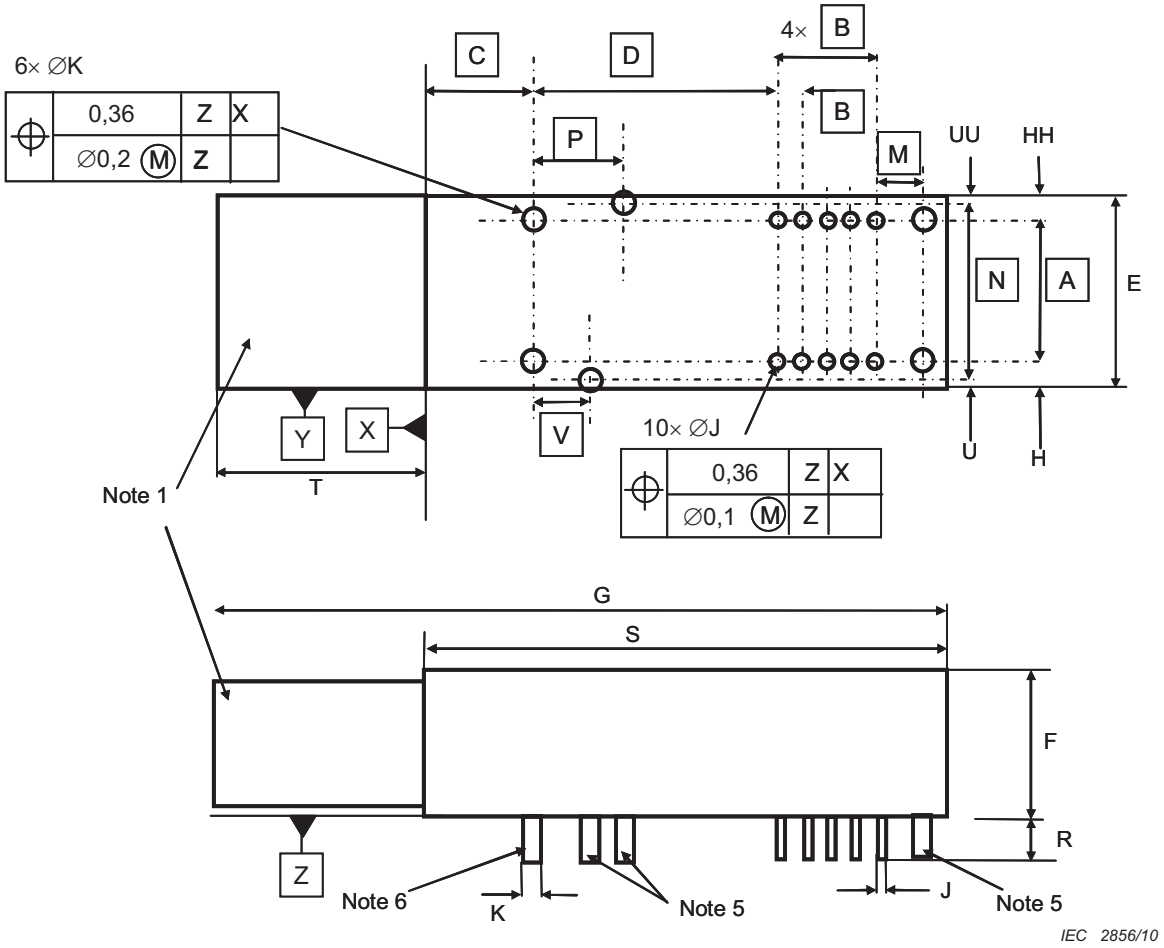


Figure 4 – Case outline of the SFF MU duplex 10-pin transceiver

Table 5 – Key to Figure 4

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A	10,16		Basic dimension
B	1,78		Basic dimension
C	7,59		Basic dimension
D	17,78		Basic dimension
E		13,59	
F		9,80	
G		49,56	Reference dimension
H		1,90	See Note 7
J	0,41	0,61	Diameter in case of rod pins (See Note 3)
K	0,97	1,07	Diameter in case of rod pins (See Note 4)
M	3,56		Basic dimension
N	13,34		Basic dimension
P	7,11		Basic dimension
R	2,92		
S		37,56	
T		12,00	
U		0,30	See Note 8
V	4,57		Basic dimension
HH		1,90	See Note 7
UU		0,30	See Note 8

NOTE 1 Defines the space available for the MU optical receptacle.

NOTE 2 All 16 pins and posts are to be treated as a single pattern.

NOTE 3 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “J”.

NOTE 4 Quadratic prism whose cross section is less than the quadrangle inscribed in the circle which diameter is “K”.

NOTE 5 Four housing leads are additional signal grounds to enhance the tolerance of Electromagnetic immunity and Electromagnetic compatibility.

NOTE 6 Two mounting studs are recommended to be tied to the chassis ground.

NOTE 7 H+HH is less than 3,63.

NOTE 8 U+UU is less than 0,45.

7.2 Optical receptacle

Refer to IEC 61754-18 for MT-RJ style.

Refer to IEC 61754-20 for LC style.

Refer to IEC 61754-6 for MU duplex style.

7.3 Drawings of case footprint

A drawing of the case footprint as well as the dimensions are given in Figure 5

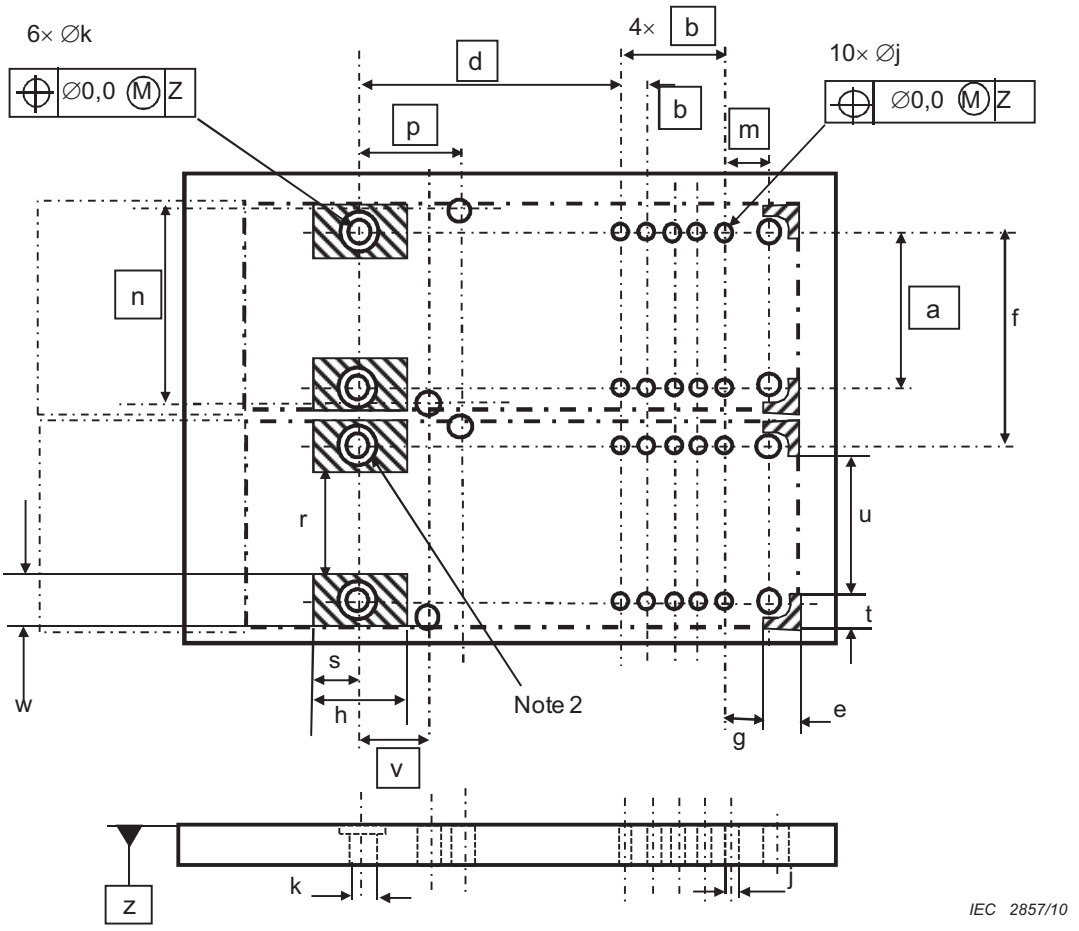


Figure 5 – Case footprint

Table 6 – Key to Figure 5

Reference	Dimensions mm		Notes
	Minimum	Maximum	
a	10,16		Basic dimension
b	1,78		Basic dimension
d	8,89		Basic dimension
e	1,90	2,10	
f	13,97		Minimum interval between two transceivers
g	3,08		
h	5,90	6,10	
j	0,71	0,91	
k	1,30	1,50	
m	3,56		Basic dimension
n	13,34		Basic dimension
p	7,11		Basic dimension
r	7,49	7,69	
s	2,90	3,10	
t	1,90	2,10	
u	9,49	9,96	
v	4,57		Basic dimension
w	2,90	3,10	

NOTE 1 The hatched areas are keep-out areas reserved for housing stand-offs. No metal traces or ground connection in keep-out areas.

NOTE 2 Maximum diameter area of 2 × 2,29 mm for mounting eyelets.

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