



**NSAI**  
Standards

Irish Standard  
I.S. EN 62148-16:2009

Fibre optic active components and devices - Package and interface standards -- Part 16: Transmitter and receiver components for use with LC connector interface (IEC 62148-16:2009 (EQV))

## I.S. EN 62148-16:2009

*Incorporating amendments/corrigenda issued since publication:*

<i>This document replaces:</i>	<i>This document is based on:</i> EN 62148-16:2009	<i>Published:</i> 11 December, 2009
This document was published under the authority of the NSAI and comes into effect on:  9 February, 2010		ICS number: 33.180.20
<b>NSAI</b> 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	<b>Sales:</b> T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

English version

**Fibre optic active components and devices -  
Package and interface standards -  
Part 16: Transmitter and receiver components  
for use with LC connector interface  
(IEC 62148-16:2009)**

Composants et dispositifs actifs  
à fibres optiques -  
Normes de boîtier et d'interface -  
Partie 16: Composants d'émetteurs  
et de récepteurs destinés à être utilisés  
avec l'interface des connecteurs LC  
(CEI 62148-16:2009)

Aktive Lichtwellenleiterbauelemente  
und -geräte -  
Gehäuse- und Schnittstellennormen -  
Teil 16: Sende- und Empfangsmodule  
für Schnittstellen mit LC-Steckverbinder  
(IEC 62148-16:2009)

This European Standard was approved by CENELEC on 2009-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

**I.S. EN 62148-16:2009**

EN 62148-16:2009

- 2 -

**Foreword**

The text of document 86C/884/FDIS, future edition 1 of IEC 62148-16, 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 62148-16 on 2009-10-01.

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

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) 2010-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-10-01

Annex ZA has been added by CENELEC.

---

**Endorsement notice**

The text of the International Standard IEC 62148-16:2009 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- |             |      |  |
|-------------|------|--|
| IEC 60191   | NOTE | Harmonized in EN 60191 series (not modified).  |
| IEC 61281-1 | NOTE | Harmonized as EN 61281-1:2009 (not modified).  |
| ISO 1101    | NOTE | Harmonized as EN ISO 1101:2005 (not modified). |

## 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61754-20	2002	Fibre optic connector interfaces - Part 20: Type LC connector family	EN 61754-20	2002
IEC 62148-1	- <sup>1)</sup>	Fibre optic active components and devices - Package and interface standards - Part 1: General and guidance	EN 62148-1	2002 <sup>2)</sup>
IEC Guide 107	1998 <sup>3)</sup>	Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications	-	-

---

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

<sup>3)</sup> IEC Guide 107:1998 is superseded by IEC Guide 107:2009.

*This page is intentionally left BLANK.*

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms, definitions and abbreviations .....	7
3.1 Terms and definitions .....	7
3.2 Abbreviations .....	7
4 Electromagnetic compatibility (EMC) requirements .....	8
5 Classification.....	8
6 Specification of transmitter component for use with LC connector interface without thermo-electric cooler .....	8
6.1 General.....	8
6.2 Electrical interface.....	8
6.2.1 General .....	8
6.2.2 Numbering of electrical terminals.....	8
6.2.3 Electrical terminals assignment .....	9
6.3 Outline and footprint.....	10
6.3.1 Drawing of package outline.....	10
6.3.2 Drawing of footprint .....	12
7 Specification of transmitter component for use with LC connector interface with thermo-electric cooler .....	13
7.1 General.....	13
7.2 Electrical interface.....	13
7.2.1 General .....	13
7.2.2 Numbering of electrical terminals.....	13
7.2.3 Electrical terminals assignment .....	14
7.3 Outline and footprint.....	16
7.3.1 Drawing of package outline.....	16
7.4 Drawing of footprint.....	18
8 Specification of receiver component for use with LC connector interface with PIN or avalanche photodiodes.....	19
8.1 General.....	19
8.2 Electrical interface.....	19
8.2.1 General .....	19
8.2.2 Electrical terminals assignment .....	20
8.3 Outline and footprint.....	22
8.3.1 Drawing of package outline.....	22
8.3.2 Drawing of footprint .....	24
9 Specification of receiver component for use with LC connector interface with avalanche photodiodes.....	25
9.1 General.....	25
9.2 Electrical Interface .....	25
9.2.1 General .....	25
9.2.2 Numbering of electrical terminals.....	25
9.2.3 Electrical terminal assignment .....	26
9.3 Outline and footprint.....	27

9.3.1	Drawing of package outline.....	27
9.3.2	Drawing of footprint .....	29
Annex A (normative)	Application to XFP transceivers.....	31
Bibliography.....		33
Figure 1	– Electrical terminal numbering assignments for transmitter component for use with LC connector interface without thermo-electric cooler .....	9
Figure 2	– Terminal function diagram .....	9
Figure 3	– Package outline drawing .....	10
Figure 4	– Recommended pattern layout for the PCB.....	12
Figure 5	– Electrical terminal numbering assignments.....	14
Figure 6	– Block diagram .....	14
Figure 7	– Package outline .....	16
Figure 8	– Recommended pattern layout for the PCB.....	18
Figure 9	– Electrical terminal numbering assignments.....	20
Figure 10	– Block diagram for option 1.....	20
Figure 11	– Block diagram for option 2.....	21
Figure 12	– Package outline .....	22
Figure 13	– Recommended pattern layout for the PCB.....	24
Figure 14	– Electrical terminal numbering assignments.....	26
Figure 15	– Block diagram .....	26
Figure 16	– Package outline .....	27
Figure 17	– Recommended pattern layout for the PCB.....	29
Figure A.1	– Recommended pattern layout for the PCB in an XFP transceiver .....	31
Figure A.2	– Recommended arrangement for the PCB in an XFP transceiver.....	32
Figure A.3	– Receptacle interface after jointing TOSA/ROSA for XFP transceiver .....	32
Table 1	– Terminal function definitions.....	10
Table 2	– Dimensions of the package outline .....	11
Table 3	– Dimensions of the recommended pattern layout for the PCB .....	13
Table 4	– Terminal function definitions.....	15
Table 5	– Dimensions of the package outline .....	17
Table 6	– Dimensions of the recommended pattern layout for the PCB .....	19
Table 7	– Terminal function definitions for option 1 .....	21
Table 8	– Terminal function definitions for option 2 .....	22
Table 9	– Dimensions of the package outline .....	23
Table 10	– Dimensions of the recommended pattern layout for the PCB .....	25
Table 11	– Terminal function definitions.....	26
Table 12	– Dimensions of the package outline .....	28
Table 13	– Dimensions of the recommended pattern layout for the PCB .....	30



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**FIBER OPTIC ACTIVE COMPONENTS AND DEVICES –  
PACKAGE AND INTERFACE STANDARDS –**
**Part 16: Transmitter and receiver components  
for use with the LC connector interface**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International standard IEC 62148-16 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

The text of this standard is based on the following documents:

FDIS	Report on voting
86C/884/FDIS	86C/904/RVD

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 of 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 maintenance result 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 10 Gbit/s are used to convert electrical signals into optical signals and vice-versa. This standard covers the physical interface for 10-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 XFP modules.

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

### Part 16: Transmitter and receiver components for use with the LC connector interface

#### 1 Scope

This part of IEC 62148 covers physical interface specification of transmitter and receiver components for use with LC connector interface.

The intent of this part of IEC 62148 is to adequately specify the physical requirements of an optical transmitter and receiver that will enable mechanical interchangeability of transmitters and receivers complying with this standard both at the PCB 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 61754-20:2002, *Fibre optic connector interfaces – Part 20: Type LC connector family*

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

IEC Guide 107: 1998, *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**

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

###### 3.1.2

###### **ROSA module**

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

##### 3.2 Abbreviations

FPC	flexible printed circuit
LD	laser diode
OSA	optical sub-assembly
PCB	printed circuit board

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-