

Fibre optic active components and devices - Package and interface standards - Part 19: Photonic chip scale package

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62148-19:2019 sisaldab Euroopa standardi EN IEC 62148-19:2019 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62148-19:2019 consists of the English text of the European standard EN IEC 62148-19:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 05.07.2019.	Date of Availability of the European standard is 05.07.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 33.180.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

**Fibre optic active components and devices - Package and  
interface standards - Part 19: Photonic chip scale package  
(IEC 62148-19:2019)**

Composants et dispositifs actifs fibroniques - Normes de  
boîtier et d'interface - Partie 19 : Boîtier à puce photonique  
(IEC 62148-19:2019)

Aktive Lichtwellenleiterbauelemente und -geräte - Gehäuse-  
und Schnittstellennormen - Teil 19: Photonisches Gehäuse  
in Chipgröße  
(IEC 62148-19:2019)

This European Standard was approved by CENELEC on 2019-06-06. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

The text of document 86C/1574/FDIS, future edition 1 of IEC 62148-19, 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 IEC 62148-19:2019.

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) 2020-03-06
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-06-06

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

## Endorsement notice

The text of the International Standard IEC 62148-19:2019 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 (series)	NOTE	Harmonized in EN 60191 (series)
IEC 61281-1	NOTE	Harmonized as EN IEC 61281-1
IEC 62148-21	NOTE	Harmonized as EN IEC 62148-21

## Annex ZA

### (normative)

### Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62148-1	-	Fibre optic active components and devices - Package and interface standards - Part 1: General and guidance	EN IEC 62148-1	-

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms, definitions and abbreviated terms .....	7
3.1 Terms and definitions.....	7
3.2 Abbreviated terms.....	7
4 Classification.....	8
5 Specification of photonic chip scale package .....	8
5.1 General.....	8
5.2 General block diagram (silicon photonics).....	8
5.3 Electrical interface .....	9
5.3.1 General .....	9
5.3.2 Numbering of electrical terminals.....	9
5.4 Optical interface.....	9
5.4.1 General .....	9
5.4.2 Free space optical beam condition.....	9
5.5 Outline and footprint .....	9
5.5.1 General .....	9
5.5.2 Drawing of footprint .....	10
Annex A (normative) Specific configurations .....	11
A.1 General.....	11
A.2 4ch transceiver .....	11
A.2.1 Block diagram.....	11
A.2.2 Electrical terminal assignments .....	12
A.2.3 Optical terminal assignments .....	15
A.2.4 Outline drawing .....	16
A.3 8ch transceiver .....	18
A.3.1 Block diagram.....	18
A.3.2 Electrical terminal assignments .....	19
A.3.3 Optical terminal assignments .....	23
A.3.4 Outline drawing .....	24
A.4 12ch transmitter and receiver.....	25
A.4.1 Block diagram.....	25
A.4.2 Electrical terminal assignments .....	27
A.4.3 Optical terminal assignments .....	32
A.4.4 Outline drawing .....	34
Bibliography.....	38
Figure 1 – General block diagram for photonic chip scale package .....	8
Figure 2 – Electrical terminal numbering assignment (top view) .....	9
Figure 3 – Recommended pattern layout for PCB.....	10
Figure 4 – Informative electrical strip line wiring for high speed electrical interface .....	10
Figure A.1 – Block diagram for chip scale package of 4ch transceiver using silicon photonics chip with optional pads for LD control.....	12

Figure A.2 – Electrical terminal numbering assignment (top view).....	13
Figure A.3 – Optical terminal numbering assignment for 0,25 mm pitch optical interface for 4ch transceiver (top view).....	16
Figure A.4 – Package outline drawing of 4ch transceiver .....	17
Figure A.5 – Block diagram for chip scale package of 8ch transceiver using silicon photonics chip with optional pads for LD control.....	19
Figure A.6 – Electrical terminal numbering assignment (top view).....	20
Figure A.7 – Optical terminal numbering assignment for 0,125 mm pitch optical interface for 8ch transceiver (top view) .....	23
Figure A.8 – Package outline drawing of 8ch transceiver .....	24
Figure A.9 – Block diagram for chip scale package of 12ch transmitter using silicon photonics chip with optional pads for LD control.....	26
Figure A.10 – Block diagram for the chip scale package of 12ch receiver with optional pad for PD bias.....	26
Figure A.11 – Electrical terminal numbering assignment (top view).....	27
Figure A.12 – Optical terminal numbering assignment for 0,125 mm pitch optical interface for 12ch transmitter and receiver (top view).....	33
Figure A.13 – Package outline drawing of 12ch transmitter .....	34
Figure A.14 – Package outline drawing of 12ch receiver .....	36
Table 1 – Dimensions of recommended pattern layout for PCB .....	10
Table A.1 – Specific configurations specified in Annex A .....	11
Table A.2 – Terminal function definitions for a 4ch transceiver.....	13
Table A.3 – Optical terminal function definitions for 4ch transceiver.....	16
Table A.4 – Dimensions of the package outline of 4ch transceiver .....	17
Table A.5 – Terminal function definitions for 8ch transceiver.....	20
Table A.6 – Optical terminal function definitions for 8ch transceiver.....	24
Table A.7 – Dimensions of the package outline of 8ch transceiver .....	25
Table A.8 – Terminal function definitions for 12ch transmitter .....	27
Table A.9 – Terminal function definitions for 12ch receiver .....	30
Table A.10 – Optical terminal function definitions for 12ch transmitter .....	33
Table A.11 – Optical terminal function definitions for 12ch receiver.....	34
Table A.12 – Dimensions of the package outline of 12ch transmitter.....	35
Table A.13 – Dimensions of the package outline of 12ch receiver .....	36

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## **Part 19: Photonic chip scale package**

### **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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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 62148-19 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86C/1574/FDIS	86C/1586/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document 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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

A photonic chip scale package is used to convert electrical signals into optical signals and vice-versa. This document covers the physical interface for photonic chip scale packages. These modules are designed for use with free space optics or multiple channel optical fibre connectors.

This document is a preview generated by EVS