

STN	Optoelektronické polovodičové súčiastky optovláknových systémov. Časť 1: Špecifikačná predloha pre základné menovité hodnoty a charakteristiky.	STN EN 62007-1
		35 9282

Semiconductor optoelectronic devices for fibre optic system applications - Part 1: Specification template for essential ratings and characteristics

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/15

Obsahuje: EN 62007-1:2015, IEC 62007-1:2015

Oznámením tejto normy sa od 04.05.2018 ruší
STN EN 62007-1 (35 9282) z augusta 2009

122192

EUROPEAN STANDARD

EN 62007-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2015

ICS 31.080.01; 31.260; 33.180.01

Supersedes EN 62007-1:2009

English Version

**Semiconductor optoelectronic devices for fibre optic system
applications - Part 1: Specification template for essential ratings
and characteristics
(IEC 62007-1:2015)**

Dispositifs optoélectroniques à semiconducteurs pour
application dans les systèmes à fibres optiques - Partie 1:
Modèle de spécification relatif aux valeurs et
caractéristiques essentielles
(IEC 62007-1:2015)

Optoelektronische Halbleiterbauelemente für Anwendungen
in Lichtwellenleitersystemen - Teil 1: Vorlage für
Leistungsspezifikationen für wesentliche Grenz- und
Kennwerte
(IEC 62007-1:2015)

This European Standard was approved by CENELEC on 2015-05-04. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, 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: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 86C/1256/CDV, future edition 3 of IEC 62007-1, 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 62007-1:2015.

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) 2016-02-04
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-05-04

This document supersedes EN 62007-1:2009.

EN 62007-1:2015 includes the following significant technical changes with respect to EN 62007-1:2009:

- 1) The definitions of some symbols and terms are revised in order to harmonize them with those in other SR 86C documents;
- 2) A clause on APD-TIA has been added.

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.

Endorsement notice

The text of the International Standard IEC 62007-1:2015 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 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 1 When 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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60825	Series	Safety of laser products	EN 60825	Series
IEC 60747-5-1	-	Discrete semiconductor devices and integrated circuits - Part 5-1: Optoelectronic devices - General	EN 60747-5-1	-



INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Dispositifs optoélectroniques à semiconducteurs pour application dans les
systèmes à fibres optiques –
Partie 1: Modèle de spécification relatif aux valeurs et caractéristiques
essentielles**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2015 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 60 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Dispositifs optoélectroniques à semiconducteurs pour application dans les
systèmes à fibres optiques –
Partie 1: Modèle de spécification relatif aux valeurs et caractéristiques
essentielles**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS: 31.080.01; 31.260; 33.180.01

ISBN 978-2-83222-589-9

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions and abbreviations	7
3.1 Terms and definitions	7
3.2 Abbreviations	9
4 LEDs for fibre optic systems or subsystems.....	9
4.1 Type	9
4.2 Semiconductor materials	9
4.3 Details of outline and encapsulation	9
4.4 Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	10
4.5 Electrical and optical characteristics	10
4.6 Supplementary information	11
5 Laser module with pigtails.....	12
5.1 Type	12
5.2 Semiconductor	12
5.2.1 Materials.....	12
5.2.2 Structure.....	12
5.3 Details of outline and encapsulation	12
5.4 Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	13
5.4.1 General conditions	13
5.4.2 Laser diode.....	13
5.4.3 Photodiode	13
5.4.4 Thermal sensor (where appropriate)	13
5.4.5 Thermoelectric cooler (where appropriate).....	14
5.5 Electric and optical characteristics.....	14
5.6 Supplementary information	15
5.7 Hazards	16
6 PIN photodiodes for fibre optic systems or subsystems.....	16
6.1 Type	16
6.2 Semiconductor materials	16
6.3 Details of outline and encapsulation	16
6.4 Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	17
6.5 Electrical and optical characteristics	18
6.6 Supplementary information	18
7 Avalanche photodiodes (APDs) with or without pigtails	19
7.1 Type	19
7.2 Semiconductor	19
7.3 Details of outline and encapsulation	19
7.4 Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	19
7.5 Electrical and optical characteristics	19
7.6 Supplementary information	20
8 PIN-TIA modules for fibre optic systems or subsystems	21

8.1	Type	21
8.2	Semiconductor materials	21
8.3	Structure	21
8.4	Details of outline and encapsulation	21
8.5	Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	22
8.6	Operating conditions at $T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise stated	22
8.7	Electrical and optical characteristics	23
8.8	Supplementary information	23
9	APD-TIA modules for fibre optic systems or subsystems	24
9.1	Type	24
9.2	Semiconductor materials	24
9.3	Structure	24
9.4	Details of outline and encapsulation	24
9.5	Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	24
9.6	Electrical and optical characteristics	25
10	Laser diode modules for pumping an optical fibre amplifier	26
10.1	Type	26
10.2	Semiconductor materials	26
10.3	Structure	26
10.4	Details of outline and encapsulation	26
10.5	Limiting values (absolute maximum ratings) over the operating temperature range, unless otherwise stated	27
10.6	Electrical and optical characteristics	27
10.7	Supplementary information	29
10.8	Hazards	29
11	Optical modulators for digital fibre optic applications	29
11.1	Type	29
11.2	Materials	29
11.3	Structure	29
11.4	Details of outline and encapsulation	30
11.5	Limiting values (absolute maximum ratings)	30
11.6	Electrical and optical characteristics	31
11.7	Supplementary information	32
11.8	Hazards	32
	Bibliography	33
	Table 1 – Limiting values for LEDs	10
	Table 2 – Electrical and optical characteristics for LEDs	11
	Table 3 – Electric and optical characteristics for laser modules with pigtails	14
	Table 4 – Limiting values for PIN photodiodes	17
	Table 5 – Electrical and optical characteristics for PIN photodiodes	18
	Table 6 – Electrical and optical characteristics for avalanche photodiodes (APDs) with or without pigtails	20
	Table 7 – Limiting values for PIN-TIA modules	22
	Table 8 – Operating conditions for PIN-TIA modules	22
	Table 9 – Electrical and optical characteristics for PIN-TIA modules	23

Table 10 – Limiting values for APD-TIA modules	25
Table 11 – Electrical and optical characteristics for APD-TIA modules	25
Table 12 – Limiting values for laser diode modules for pumping an optical fibre amplifier	27
Table 13 – Electrical and optical characteristics for laser diode modules for pumping an optical fibre amplifier	28
Table 14 – Limiting values for optical modulators for digital fibre optic applications	30
Table 15 – Electrical and optical characteristics for optical modulators for digital fibre optic applications	31

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**SEMICONDUCTOR OPTOELECTRONIC DEVICES
FOR FIBRE OPTIC SYSTEM APPLICATIONS –****Part 1: Specification template for essential ratings and characteristics**

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 62007-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition.

- 1) The definitions of some symbols and terms are revised in order to harmonize them with those in other SC 86C documents.
- 2) A clause on APD-TIA has been added.

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

CDV	Report on voting
86C/1256/CDV	86C/1283/RVC

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 in the IEC 62007 series, published under the general title *Semiconductor optoelectronic devices for fibre optic system applications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

SEMICONDUCTOR OPTOELECTRONIC DEVICES FOR FIBRE OPTIC SYSTEM APPLICATIONS –

Part 1: Specification template for essential ratings and characteristics

1 Scope

This part of IEC 62007 is a specification template for essential ratings and characteristics of the following categories of semiconductor optoelectronic devices to be used in the field of fibre optic systems and subsystems:

- semiconductor photoemitters;
- semiconductor photoelectric detectors;
- monolithic or hybrid integrated optoelectronic devices and their modules.

This part of IEC 62007 provides a frame for the preparation of detail specifications for the essential ratings and characteristics.

In using this part of IEC 62007, detail specification writers add but do not delete specification parameters and/or groups of specification parameters for particular applications.

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 60825 (all parts), *Safety of laser products*

IEC 60747-5-1, *Discrete semiconductor devices and integrated circuits – Part 5-1: Optoelectronic devices – General*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN