

STN	Optovláknové aktívne súčiastky a prvky Normy na prevádzkové charakteristiky Časť 10: RoF (radio over fiber) vysielače-prijímače pre mobilný fronthaul	STN EN IEC 62149-10 35 9255
------------	--	---

Fibre optic active components and devices - Performance standards - Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul

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. 04/19

Obsahuje: EN IEC 62149-10:2018, IEC 62149-10:2018

128606

EUROPEAN STANDARD

EN IEC 62149-10

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2018

ICS 33.180.99

English Version

Fibre optic active components and devices - Performance standards - Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul
(IEC 62149-10:2018)

Composants et dispositifs actifs fibroniques - Normes de performances - Partie 10: Émetteurs récepteurs radio sur fibre (RoF) pour le fronthaul des réseaux mobiles(IEC 62149-10:2018)

Aktive Lichtwellenleiterbauelemente und -geräte - Betriebsverhaltensnormen - Teil 10: RoF-Sende-Empfangsgeräte (Funk über Lichtwellenleiter) für Mobilfunk Fronthaul-Anwendungen
(IEC 62149-10:2018)

This European Standard was approved by CENELEC on 2018-12-12. 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, 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

EN IEC 62149-10:2018 (E)**European foreword**

The text of document 86C/1501/CDV, future edition 1 of IEC 62149-10, 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 62149-10:2018.

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) 2019-09-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-12-12

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 62149-10:2018 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 as EN 60191 (series)
IEC 60749 (series)	NOTE	Harmonized as EN 60749 (series)
IEC 60793-2 (series)	NOTE	Harmonized as EN 60793-2 (series)
IEC 60794-2	NOTE	Harmonized as EN 60794-2
IEC 60825 (series)	NOTE	Harmonized as EN 60825 (series)
IEC 60874 (series)	NOTE	Harmonized in EN 60874 (series)
IEC 61281-1	NOTE	Harmonized as EN IEC 61281-1
IEC 61290-1-3	NOTE	Harmonized as EN 61290-1-3
IEC 61300-2-4	NOTE	Harmonized as EN 61300-2-4
IEC 61300-2-19	NOTE	Harmonized as EN 61300-2-19
IEC 61300-2-48	NOTE	Harmonized as EN 61300-2-48
IEC 62007-1	NOTE	Harmonized as EN 62007-1
IEC 62007-2	NOTE	Harmonized as EN 62007-2
IEC 62148-1	NOTE	Harmonized as EN IEC 62148-1
IEC 62149-1	NOTE	Harmonized as EN 62149-1
IEC 62149-8	NOTE	Harmonized as EN 62149-8
IEC 62149-9	NOTE	Harmonized as EN 62149-9

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-20	-	Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN 60068-2-20	-
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-38	-	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test	EN 60068-2-38	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60749-25	-	Semiconductor devices - Mechanical and climatic test methods - Part 25: Temperature cycling	EN 60749-25	-
IEC 60749-26	-	Semiconductor devices - Mechanical and climatic test methods - Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)	EN IEC 60749-26	-
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 60950-1 (mod)	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 61300-2-47	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-47: Tests - Thermal shocks	EN 61300-2-47	-
ITU-T Recommendation G.Sup55	-	Supplement 55, Radio-over-fibre (RoF) technologies and their applications	-	-



IEC 62149-10

Edition 1.0 2018-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Fibre optic active components and devices – Performance standards –
Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul**

**Composants et dispositifs actifs fibroniques – Normes de performances –
Partie 10: Émetteurs récepteurs radio sur fibre (RoF) pour le fronthaul des
réseaux mobiles**



**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2018 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
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 - webstore.iec.ch/advsearchform

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 21 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67 000 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: sales@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 - webstore.iec.ch/advsearchform

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 21 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 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: sales@iec.ch.



IEC 62149-10

Edition 1.0 2018-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Fibre optic active components and devices – Performance standards –
Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul**

**Composants et dispositifs actifs fibroniques – Normes de performances –
Partie 10: Émetteurs récepteurs radio sur fibre (RoF) pour le fronthaul des
réseaux mobiles**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.99

ISBN 978-2-8322-6174-3

**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.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms, definitions, symbols and abbreviated terms.....	7
3.1 Terms and definitions.....	7
3.2 Symbols.....	7
3.3 Abbreviated terms.....	7
4 Product parameters	8
4.1 Absolute limiting ratings	8
4.2 Operating environment.....	8
4.3 Functional specification.....	8
5 Testing	8
5.1 General.....	8
5.2 Characterization testing	9
5.3 Performance testing.....	9
6 Environmental specifications	9
6.1 General safety	9
6.2 Laser safety	9
6.3 Electromagnetic compatibility (EMC) requirements.....	9
Annex A (normative) Specifications for RoF transceivers for mobile fronthaul	10
A.1 Absolute limiting ratings	10
A.2 Operating environment.....	10
A.3 Functional specification.....	10
A.4 Diagrams	11
A.5 Labelling	13
A.6 Testing	13
A.6.1 General	13
A.6.2 Characterization testing.....	14
A.6.3 Performance testing.....	14
Annex B (normative) Sample size and grouping requirements.....	17
Bibliography.....	18
Figure A.1 – Block diagram of RoF transceiver	12
Figure A.2 – Interface/reference points compliant with ITU-T G-Series Recommendations – Supplement 55	13
Table 1 – Operating environment	8
Table A.1 – Absolute limiting ratings	10
Table A.2 – Functional specification.....	11
Table A.3 – Characterization tests	14
Table A.4 – Performance test plan	15
Table B.1 – Sample size, sequencing and grouping requirements	17

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES –
PERFORMANCE STANDARDS –****Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul**

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 62149-10 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:

CDV	Report on voting
86C/1501/CDV	86C/1531/RVC

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 62149 series, published under the general title *Fibre optic active components and devices – Performance 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62149 covers the performance specification for radio-over-fibre (RoF) transceivers in fibre optic mobile fronthaul applications. The performance criteria are generally well specified for a number of internationally agreed application areas, such as ITU-T G-series Recommendations – Supplement 55. This document provides optical interface specifications toward the realization of transversely compatible mobile fronthaul systems based on RoF technology. RoF transceivers for mobile fronthaul systems are supplied by different manufacturers, but those manufacturers do not guarantee the operation of RoF transceivers in mobile fronthaul systems. Manufacturers using this document are responsible for meeting the required performance and/or reliability and quality assurance under a recognized scheme.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 10: Radio-over-fibre (RoF) transceivers for mobile fronthaul

1 Scope

This part of IEC 62149 covers the performance specification for radio-over-fibre (RoF) transceivers used for mobile fronthaul systems. The performance standard contains a definition of the product performance requirements together with a series of tests and measurements with clearly defined conditions, severities, and pass/fail criteria. The tests are intended to be run on a one-off basis to prove any product's ability to satisfy the performance standard's requirements.

A product that has been shown to meet all the requirements of a performance standard can be declared to be in compliance with the performance standard.

2 Normative references

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.

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-38, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60749-25, *Semiconductor devices – Mechanical and climatic test methods – Part 25: Temperature cycling*

IEC 60749-26, *Semiconductor devices – Mechanical and climatic test methods – Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61300-2-47, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-47: Tests – Thermal shocks*

ITU-T G-Series Recommendations – Supplement 55, *Radio-over-fibre (RoF) technologies and their applications*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN