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INTERNATIONAL STANDARD

Fibre optic active components and devices – Performance standards – Part 3: Modulator-integrated laser diode transmitters for ~~2,5 Gbit/s to~~ 40-Gbit/s fibre optic transmission systems

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 3: Modulator-integrated laser diode transmitters for ~~2,5-Gbit/s to~~ 40-Gbit/s fibre optic transmission systems

FOREWORD

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International Standard IEC 62149-3 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 2014 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: updates of the title, scope, normative references and performance test tables.

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

FDIS	Report on voting
86C/1666/FDIS	86C/1676/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 62149 series, published under the general title *Fibre optic active components and devices – Performance standards*, can be found on the IEC website.

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The contents of the corrigendum of February 2021 have been included in this copy.

INTRODUCTION

Fibre optic transmitters are used to convert electrical signals into optical signals. This document covers the performance standard for optical modulators monolithically integrated with laser diodes for ~~2,5 Gbit/s to 40 Gbit/s multi-channel~~ 40 Gbit/s optical telecommunication systems. This document is applicable for on-off keying format.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 3: Modulator-integrated laser diode transmitters for ~~2,5-Gbit/s to~~ 40-Gbit/s fibre optic transmission systems

1 Scope

This part of IEC 62149 covers the performance specification for electroabsorption (EA) type optical modulators monolithically integrated with laser diodes for ~~2,5 Gbit/s to 40 Gbit/s multi-channel~~ 40 Gbit/s fibre optic transmission systems. This ~~performance~~ document contains a definition of the product performance requirements together with a series of sets of tests and measurements with clearly defined conditions, severities and pass/fail criteria. The tests are intended to be run as an initial design verification to prove any product's ability to satisfy this ~~performance~~ document's requirements. This document is ~~only~~ applicable for on-off keying format.

A product that has been shown to meet all the requirements of a performance standard can be declared as compliant with the performance standard but ~~should~~ will then be controlled by a quality assurance program.

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 60068-2-1, *Environmental testing – Part 2-1: Tests – Test~~s~~ A: Cold*

IEC 60068-2-2, *~~Basic~~ Environmental testing ~~procedures~~ – Part 2-2: Tests – Test~~s~~ B: Dry heat*

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

IEC 60068-2-14, *~~Basic~~ Environmental testing ~~procedures~~ – Part 2-14: Tests – Test N: Change of temperature*

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

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

IEC 60749-7, *Semiconductor devices – Mechanical and climatic test methods – Part 7: Internal moisture content measurement and the analysis of other residual gases*

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IEC 62149-3

Edition 3.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic active components and devices – Performance standards – Part 3: Modulator-integrated laser diode transmitters for 40-Gbit/s fibre optic transmission systems

Composants et dispositifs actifs fibroniques – Normes de performances – Partie 3: Émetteurs à diodes laser à modulateur intégré pour systèmes de transmission fibroniques 40 Gbit/s

IEC 62149-3:2020-07(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 3: Modulator-integrated laser diode transmitters for 40-Gbit/s fibre optic transmission systems

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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COMPOSANTS ET DISPOSITIFS ACTIFS FIBRONIQUES – NORMES DE PERFORMANCES –

Partie 3: Émetteurs à diodes laser à modulateur intégré pour systèmes de transmission fibroniques 40 Gbit/s

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La Norme internationale IEC 62149-3 a été établie par le sous-comité 86C: Systèmes et dispositifs actifs à fibres optiques, du comité d'études 86 de l'IEC: Fibres optiques.

Cette troisième édition annule et remplace la deuxième édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente: mise à jour du titre, du domaine d'application, des références normatives et des tableaux des essais de performance.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
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Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 62149, publiées sous le titre général *Composants et dispositifs actifs fibroniques – Normes de performances*, peut être consultée sur le site web de l'IEC

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Le contenu du corrigendum de février 2021 a été pris en considération dans cet exemplaire.

INTRODUCTION

Les émetteurs fibroniques sont utilisés pour convertir les signaux électriques en signaux optiques. Le présent document couvre la norme de performance relative aux modulateurs optiques avec diodes laser intégrées de façon monolithique, destinés à des systèmes de télécommunications optiques 40 Gbit/s. Le présent document s'applique au format de codage binaire.

COMPOSANTS ET DISPOSITIFS ACTIFS FIBRONIQUES – NORMES DE PERFORMANCES –

Partie 3: Émetteurs à diodes laser à modulateur intégré pour systèmes de transmission fibroniques 40 Gbit/s

1 Domaine d'application

La présente partie de l'IEC 62149 couvre les spécifications de performance concernant les modulateurs optiques à électro-absorption (EA) avec diodes laser intégrées de façon monolithique, destinés à des systèmes de transmission fibroniques 40 Gbit/s. Le présent document donne une définition des exigences de performances de produits, ainsi qu'une série d'ensembles d'essais et de mesures, avec des conditions, des sévérités et des critères d'acceptation/de rejet clairement définis. Les essais sont destinés à être réalisés à titre de vérification initiale de conception, pour prouver la capacité d'un quelconque produit à satisfaire aux exigences de la norme de performance. Le présent document s'applique au format de codage binaire.

Un produit qui a montré qu'il satisfaisait à toutes les exigences d'une norme de performance peut être déclaré comme conforme à la norme de performance, mais il sera ensuite contrôlé selon un programme d'assurance de la qualité.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068-2-1, *Essais d'environnement – Partie 2-1: Essais – Essai A: Froid*

IEC 60068-2-2, *Essais d'environnement – Partie 2-2: Essais – Essai B: Chaleur sèche*

IEC 60068-2-6, *Essais d'environnement – Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)*

IEC 60068-2-14, *Essais d'environnement – Partie 2-14: Essais – Essai N: Variation de température*

IEC 60068-2-27, *Essais d'environnement – Partie 2-27: Essais – Essai Ea et guide: Chocs*

IEC 60068-2-78, *Essais d'environnement – Partie 2-78: Essais – Essai Cab: Chaleur humide, essai continu*

IEC 60749-7, *Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques – Partie 7: Mesure de la teneur en humidité interne et analyse des autres gaz résiduels*

IEC 60749-26, *Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques – Partie 26: Essai de sensibilité aux décharges électrostatiques (DES) – Modèle du corps humain (HBM)*

IEC 60825-1, *Sécurité des appareils à laser – Partie 1: Classification des matériels et exigences*

IEC 60950-1, *Matériels de traitement de l'information – Sécurité – Partie 1: Exigences générales*

IEC 61300-2-4, *Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures – Partie 2-4: Essais – Rétention de la fibre ou du câble*

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

IEC 62572-3, *Composants et dispositifs actifs en fibres optiques – Normes de fiabilité – Partie 3: Modules laser utilisés pour les télécommunications*

Recommandation UIT-T G.694.1, *Grilles spectrales pour les applications de multiplexage par répartition en longueur d'onde: grille dense DWDM*

Recommandation UIT-T G.957, *Interfaces optiques pour les équipements et les systèmes relatifs à la hiérarchie numérique synchrone*

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