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INTERNATIONAL STANDARD



**Fibre optic active components and devices – Performance standards –
Part 4: 1 300 nm fibre optic transceivers for Gigabit Ethernet application**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD	3
INTRODUCTION	2
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	8
4 Product parameters	7
4.1 Absolute limiting ratings	8
4.2 Operating environment	9
4.3 Functional specification	9
4.4 Diagrams	11
4.5 Labelling	11
5 Testing	12
5.1 General	12
5.2 Characterization testing	12
5.3 Performance testing	13
5.3.1 Sequence of testing	13
5.3.2 Sample size, sequencing and groupings	13
6 Environmental specifications	15
6.1 General safety	15
6.2 Laser safety	15
6.3 Electromagnetic emission	15
Annex A (normative) Sample size, sequencing and grouping requirements	16
Figure 1 – Receiver section schematic	11
Figure 2 – Transmitter section schematic	11
Table 1 – Absolute limiting ratings	9
Table 2 – Operating environment	9
Table 3 – Receiver section: functional specification	9
Table 4 – Transmitter section: functional specification	10
Table 5 – Transmitter section characterization tests	12
Table 6 – Receiver section characterization tests	12
Table 7 – Performance test plan	14
Table A.1 – Sample size, sequencing and grouping requirements	16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES –
PERFORMANCE STANDARDS –****Part 4: 1 300 nm fibre optic transceivers
for Gigabit Ethernet application**

FOREWORD

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IEC 62149-4 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

- a) the normative references are updated;
- b) the condition "for short periods" in 4.1 is removed;
- c) the absolute limiting rating for soldering temperature in Table 1 is modified;
- d) the maximal optical output power (multimode fibre) in Table 4 is increased from –3,5 dBm to –3 dBm, to align value with the referenced document;
- e) a note is added to Table 7 to clarify that out-of-specification products are not allowed to pass the performance tests.

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

Draft	Report on voting
86C/1800/CDV	86C/1826/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- amended.

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INTRODUCTION

Fibre optic transceivers are used to convert electrical signals into optical signals and vice versa. This document specifies performance standards for 1 300 nm fibre optic transceivers for Gigabit Ethernet application. The ISO/IEC/IEEE 8802-3 Gigabit Ethernet standard is used as the basis for determining the optical characteristics of the transceiver, which operates at a line rate of 1,25 Gbit/s.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

Part 4: 1 300 nm fibre optic transceivers for Gigabit Ethernet application

1 Scope

This part of IEC 62149 defines performance specifications for 1 300 nm fibre optic transceiver modules used for the ISO/IEC/IEEE 8802-3 Gigabit Ethernet application. This document contains definitions for product performance requirements as well as a series of tests and measurements, for which clearly defined conditions, severities and pass/fail criteria are provided. The tests are intended to be run on a "once-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 as complying with the performance standard but ~~should~~ will then be controlled by a quality assurance/quality conformance 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 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test ~~F~~ Ta and Tb: 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 ~~60028~~ 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 60938-1, *Fixed inductors for electromagnetic interference suppression – Part 1: Generic specification*

IEC 60950-1:~~2004~~, *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*

~~ISO/IEC 8802-3:2000, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*~~

ISO/IEC/IEEE 8802-3:2021, *Telecommunications and exchange between information technology systems – Requirements for local and metropolitan area networks – Part 3: Standard for Ethernet*

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic active components and devices – Performance standards –
Part 4: 1 300 nm fibre optic transceivers for Gigabit Ethernet application**

**Composants et dispositifs actifs fibroniques – Normes de performance –
Partie 4: Émetteurs-récepteurs fibroniques de 1 300 nm pour application Gigabit
Ethernet**



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	8
4 Product parameters	8
4.1 Absolute limiting ratings	8
4.2 Operating environment	9
4.3 Functional specification	9
4.4 Diagrams	10
4.5 Labelling	11
5 Testing	11
5.1 General	11
5.2 Characterization testing	11
5.3 Performance testing	12
5.3.1 Sequence of testing	12
5.3.2 Sample size, sequencing and groupings	12
6 Environmental specifications	14
6.1 General safety	14
6.2 Laser safety	14
6.3 Electromagnetic emission	14
Annex A (normative) Sample size, sequencing and grouping requirements	15
Figure 1 – Receiver section schematic	10
Figure 2 – Transmitter section schematic	11
Table 1 – Absolute limiting ratings	8
Table 2 – Operating environment	9
Table 3 – Receiver section: functional specification	9
Table 4 – Transmitter section: functional specification	10
Table 5 – Transmitter section characterization tests	12
Table 6 – Receiver section characterization tests	12
Table 7 – Performance test plan	13
Table A.1 – Sample size, sequencing and grouping requirements	15

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SOMMAIRE

AVANT-PROPOS	17
INTRODUCTION.....	19
1 Domaine d'application	20
2 Références normatives	20
3 Termes, définitions, symboles et abréviations.....	21
3.1 Termes et définitions	21
3.2 Symboles.....	21
3.3 Abréviations.....	22
4 Paramètres relatifs au produit.....	22
4.1 Valeurs limites absolues	22
4.2 Environnement de fonctionnement.....	23
4.3 Spécification fonctionnelle	23
4.4 Schémas.....	25
4.5 Etiquetage	26
5 Essais	26
5.1 Généralités	26
5.2 Essais de caractérisation	26
5.3 Essais de performance	27
5.3.1 Séquence d'essais.....	27
5.3.2 Nombre, séquences et groupements d'échantillons.....	27
6 Spécifications relatives à l'environnement	30
6.1 Sécurité générale.....	30
6.2 Sécurité du laser.....	30
6.3 Emission électromagnétique	30
Annex A (normative) Exigences relatives aux nombre, séquences et groupements d'échantillons.....	31
Figure 1 – Schéma de section du récepteur	25
Figure 2 – Schéma de section de l'émetteur.....	26
Tableau 1 – Valeurs limites absolues	23
Tableau 2 – Environnement de fonctionnement.....	23
Tableau 3 – Section du récepteur: spécification fonctionnelle	24
Tableau 4 – Section de l'émetteur: spécification fonctionnelle.....	25
Tableau 5 – Essais de caractérisation de la section d'émetteur.....	27
Tableau 6 – Essais de caractérisation de la section du récepteur	27
Tableau 7 – Plan d'essais de performance.....	28
Tableau A.1 – Exigences relatives aux nombre, séquences et groupements d'échantillons.....	31

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

COMPOSANTS ET DISPOSITIFS ACTIFS FIBRONIQUES – NORMES DE PERFORMANCE –

Partie 4: Émetteurs-récepteurs fibroniques de 1 300 nm pour application Gigabit Ethernet

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L'IEC 62149-4 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. Il s'agit d'une Norme internationale.

Cette troisième édition annule et remplace la deuxième édition parue en 2010. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) mise à jour des références normatives;
- b) suppression de la condition "pour de courtes périodes" au 4.1;
- c) modification des valeurs limites absolues pour la température de brasage au Tableau 1;

- d) augmentation de la puissance de sortie optique maximale (fibre multimodale) du Tableau 4, de –3,5 dBm à –3 dBm, afin d'aligner la valeur par rapport au document de référence;
- e) ajout d'une note au Tableau 7, pour clarifier le fait que les produits non conformes à la spécification ne sont pas autorisés à réussir les essais de performance.

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

Projet	Rapport de vote
86C/1800/CDV	86C/1826/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications/.

Une liste de toutes les parties de la série IEC 62149, publiées sous le titre général *Composants et dispositifs actifs fibroniques – Normes de performance*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

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- amendé.

INTRODUCTION

Les émetteurs-récepteurs fibroniques sont utilisés pour convertir les signaux électriques en signaux optiques et vice versa. Le présent document spécifie les normes de performance pour les émetteurs-récepteurs fibroniques de 1 300 nm pour application Gigabit Ethernet. La norme Gigabit Ethernet ISO/IEC/IEEE 8802-3 est utilisée comme base pour déterminer les caractéristiques optiques de l'émetteur-récepteur, qui fonctionne à une vitesse de 1,25 Gbit/s.

COMPOSANTS ET DISPOSITIFS ACTIFS FIBRONIQUES – NORMES DE PERFORMANCE –

Partie 4: Émetteurs-récepteurs fibroniques de 1 300 nm pour application Gigabit Ethernet

1 Domaine d'application

La présente partie de l'IEC 62149 définit les spécifications de performance pour les modules d'émetteur-récepteur fibroniques de 1 300 nm utilisés pour l'application Gigabit Ethernet de l'ISO/IEC/IEEE 8802-3. Ce document contient des définitions des exigences de performance de produit ainsi qu'une série d'essais et de mesures, pour lesquels des conditions, sévérités et critères de réussite/d'échec clairement définis sont fournis. Chaque essai est destiné à être effectué une seule fois pour prouver la capacité des produits à satisfaire aux exigences des normes de performance.

Un produit dont la conformité à toutes les exigences d'une norme de performance a été démontrée peut être déclaré conforme à la norme de performance, mais il sera ensuite contrôlé selon un programme d'assurance de la qualité/de conformité de la qualité.

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

IEC 60068-2-20, *Essais d'environnement – Partie 2-20: Essais – Essais Ta et Tb: Méthodes d'essai de la brasabilité et de la résistance à la chaleur de brasage des dispositifs à broches*

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

IEC 60749-25, *Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques – Partie 25: Cycles de température*

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