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colour inside

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

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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

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FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – PERFORMANCE STANDARDS –

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

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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.

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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.

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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~~ 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~~:2001~~, *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*

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Edition 3.0 2022-12

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



IEC 62149-4:2022-12(en-fr)

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

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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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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/.

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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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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*

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 60938-1, *Inductances fixes d'antiparasitage – Partie 1: Spécification générique*

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