IEC 63267-2-1

Edition 1.0 2024-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Fibre optic interconnecting devices and passive components – Connector optical interfaces for enhanced macro bend multimode fibres – Part 2-1: Connection parameters of physically contacting 50 µm core diameter fibres – Non-angled

Dispositifs d'interconnexion et composants passifs fibroniques – Interfaces optiques de connecteurs pour fibres multimodales améliorées en macrocourbures – Partie 2-1 : Paramètres de connexion des fibres d'un diamètre de cœur de 50 µm en contact physique – Sans angle



IEC 63267-2-1:2024-03(en-fr)



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8322-8423-0

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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTOR OPTICAL INTERFACES FOR ENHANCED MACRO BEND MULTIMODE FIBRES –

Part 2-1: Connection parameters of physically contacting 50 µm core diameter fibres – Non-angled

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IEC 63267-2-1 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

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

Draft	Report on voting
86B/4858/FDIS	86B/4877/RVD

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 63267 series, under the general title *Fibre optic interconnecting devices and passive components – Connector optical interfaces for enhanced macro bend multimode fibre*, can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

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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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTOR OPTICAL INTERFACES FOR ENHANCED MACRO BEND MULTIMODE FIBRES –

Part 2-1: Connection parameters of physically contacting 50 µm core diameter fibres – Non-angled

1 Scope

This part of IEC 63267 defines a set of specified conditions for an enhanced macro bend of 50/125 µm, graded index multimode fibre optic connection that is maintained in order to satisfy the requirements of attenuation and return loss performance in a randomly mated pair of polished physically contacting (PC) fibres.

An encircled flux (EF) compliant launch condition in accordance with IEC 61300-1, at an operational wavelength of 850 nm, is used for determination of performance grades, based on lateral fibre core offset, numerical aperture (NA) mismatch, and fibre core diameter (CD) variation. Fibre core angular offset is considered insignificant given the state-of-the-art and is excluded as a factor for attenuation estimation.

Attenuation and return loss performance grades are defined in IEC 63267-1.

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 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-34, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-34: Examinations and measurements – Attenuation of random mated connectors*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-35: Examinations and measurements – Visual inspection of fibre optic connectors and fibre-stub transceivers*

IEC 61300-3-45, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-45: Examinations and measurements – Attenuation of random mated multi-fibre connectors*

IEC 63267-1, *Fibre optic interconnecting devices and passive components – Fibre optic connector optical interfaces – Part 1: Enhanced macro bend loss multimode 50 µm core diameter fibres – General and guidance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 63267-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

4 Attenuation and return loss grades

Proposed attenuation and return loss grades for PC polished connections are given in Table 1 and Table 2.

Table 1 – Multimode random mate attenuation grades at 850 nm

Attenuation grade	Attenuation mean dB	Attenuation[a] ≥ 97 %[b] dB	Notes
Am			Reserved for future application
Bm	≤ 0,30	≤ 0,60	
Cm	≤ 0,50	≤ 1,00	
Dm			Not specified at this time

[a] Attenuation shall be measured by IEC 61300-3-34 for single-fibre connectors and IEC 61300-3-45 for multi-fibre connectors.

[b] The probability of a random mated connection set to meet the specified attenuation requirement will be ≥ 97 %. This performance is reached considering a statistical distribution of the connection's parameters (optical fibre core diameter, numerical aperture, and lateral offset) and using an encircled flux (EF) compliant launch at the source operating at a nominal value for wavelength of 850 nm.

Table 2 – Multimode return loss grades at 850 nm

Return loss grade	Return loss (mated) [a] dB	Notes
1		Grade 1 is defined as ≥ 45 dB (mated) and reserved for use with angled, physically contacting fibres
2	≥ 20	

[a] The test shall be carried out in accordance with IEC 61300-3-6.

5 Criteria for a fit within attenuation and return loss grades

5.1 General

The criteria for meeting the attenuation and return loss grades listed in Table 1 and Table 2 are given in Figure 1 to Figure 3 and Table 3 and Table 4. The parameters chosen for the criteria definition are based on the degree of significance in affecting the performance under test. The criteria selected are based on the theoretical model in 5.2, as well as experimental results.

IEC TR 62614-2, which is a Technical Report, provides further background on EF in conjunction with attenuation and return loss of graded index multimode fibre products.

5.2 Attenuation grades and criteria

When launched into multimode optical fibre, light emitting diode (LED) and laser sources can exhibit varying modal power distributions. These differing modal power distributions, combined with the differential mode attenuation (DMA) inherent in most multimode components,