



SLOVENSKI STANDARD
oSIST prEN IEC 61753-051-02:2022
01-februar-2022

**Optični spojni elementi in pasivne komponente - Izvedbeni standard - 051-02. del:
Enorodovni fiksni optični atenuatorji v obliki vtič-vtičnica za kategorijo C -
Nadzorovana okolja**

Fibre optic interconnecting devices and passive components - Performance standard -
Part 051-02: Plug-receptacle style single-mode fibre fixed optical attenuators for
category C - Controlled environments

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SECRETARIAT: Japan	SECRETARY: Mr Shigeru Tomita
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
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<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Fibre optic interconnecting devices and passive components - Performance standard - Part 051-02: Plug-receptacle style single-mode fibre fixed optical attenuators for category C - Controlled environments

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES
AND PASSIVE COMPONENTS -
PERFORMANCE STANDARD -**

**Part 051-02: Plug-receptacle style single-mode fibre fixed optical
attenuators for category C - Controlled environments**

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International Standard IEC 61753-051-02 has been prepared by subcommittee SC86B: Fibre optic interconnecting devices and passive components, of IEC technical committee TC86: Fibre optics.

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

FDIS	Report on voting
86B/XX/FDIS	86B/XX/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.

71 The committee has decided that the contents of this document will remain unchanged until the
72 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to
73 the specific document. At this date, the document will be

- 74 • reconfirmed,
- 75 • withdrawn,
- 76 • replaced by a revised edition, or
- 77 • amended.
- 78

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INTRODUCTION

80 The performance standard of single-mode plug style optical attenuators has been published in
81 2001 as IEC 61753-051-3, Ed.1, Fibre optic interconnecting devices and passive components
82 - Performance standard - Part 051-3: Single-mode fibre, plug style fixed attenuators for category
83 U - Uncontrolled environment. After publication of the corrigendum in 2004, the second edition
84 which test details and requirements were reconsidered has been published in 2013. In 2019,
85 the market survey of five Japanese suppliers, two Chinese ones and one Switzerland ones has
86 been carried out. As a result of the survey, it was revealed that some suppliers could not comply
87 the category U requirements. SC86B decided to withdraw IEC 61753-051-3 and establish this
88 document of IEC 61753-051-02 for category C reflecting the survey result.

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**FIBRE OPTIC INTERCONNECTING DEVICES
AND PASSIVE COMPONENTS -
PERFORMANCE STANDARD -
Part 051-02: Plug-receptacle style single-mode fibre fixed optical
attenuators for category C - Controlled environments**

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97 **1 Scope**

98 This part of IEC 61753 contains the minimum initial test and measurement requirements and
99 severities which plug-receptacle style single-mode fibre fixed optical attenuators need to satisfy
100 in order to be categorized as meeting the requirements of category C – Controlled environments,
101 as defined in Annex A of IEC 61753-1.

102 **2 Normative references**

103 The following documents are referred to in the text in such a way that some or all of their content
104 constitutes requirements of this document. For dated references, only the edition cited applies.
105 For undated references, the latest edition of the referenced document (including any
106 amendments) applies.

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

108 IEC 60793-2-50, *Optical fibres - Part 2-50: Product specifications - Sectional specification for*
109 *class B single-mode fibres*

110 IEC 60869-1, *Fibre optic interconnecting devices and passive components - Fibre optic passive*
111 *power control devices - Part 1: Generic specification*

112 IEC 61300 (all parts), *Fibre optic interconnecting devices and passive components – Basic test*
113 *and measurement procedures*

114 IEC 61300-2-1, *Fibre optic interconnecting devices and passive components – Basic test and*
115 *measurement procedures – Part 2-1: Tests – Vibration (sinusoidal)*

116 IEC 61300-2-2, *Fibre optic interconnecting devices and passive components - Basic test and*
117 *measurement procedures - Part 2-2: Tests - Mating durability*

118 IEC 61300-2-6, *Fibre optic interconnecting devices and passive components - Basic test and*
119 *measurement procedures - Part 2-6: Tests - Tensile strength of coupling mechanism*

120 IEC 61300-2-9, *Fibre optic interconnecting devices and passive components – Basic test and*
121 *measurement procedures – Part 2-9: Tests – Shock*

122 IEC 61300-2-12, *Fibre optic interconnecting devices and passive components - Basic test and*
123 *measurement procedures - Part 2-12: Tests - Impact*

124 IEC 61300-2-14, *Fibre optic interconnecting devices and passive components – Basic test and*
125 *measurement procedures – Part 2-14: Tests –High optical power*

126 IEC 61300-2-17, *Fibre optic interconnecting devices and passive components – Basic test and*
127 *measurement procedures – Part 2-17: Tests – Cold*

128 IEC 61300-2-18, *Fibre optic interconnecting devices and passive components – Basic test and*
129 *measurement procedures – Part 2-18: Tests – Dry heat*

130 IEC 61300-2-19, *Fibre optic interconnecting devices and passive components – Basic test and*
 131 *measurement procedures – Part 2-19: Tests – Damp heat (steady state)*

132 IEC 61300-2-22, *Fibre optic interconnecting devices and passive components – Basic test and*
 133 *measurement procedures – Part 2-22: Tests – Change of temperature*

134 IEC 61300-3-2, *Fibre optic interconnecting devices and passive components – Basic test and*
 135 *measurement procedures – Part 3-2: Examination and measurements – Polarization dependent*
 136 *loss in a single-mode fibre optic device*

137 IEC 61300-3-3, *Fibre optic interconnecting devices and passive components - Basic test and*
 138 *measurement procedures - Part 3-3: Examinations and measurements - Active monitoring of*
 139 *changes in attenuation and return loss*

140 IEC 61300-3-4, *Fibre optic interconnecting devices and passive components - Basic test and*
 141 *measurement procedures - Part 3-4: Examinations and measurements - Attenuation*

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

144 IEC 61300-3-28, *Fibre optic interconnecting devices and passive components - Basic test and*
 145 *measurement procedures - Part 3-28: Examinations and measurements - Transient loss*

146 IEC 61753-1, *Fibre optic interconnecting devices and passive components – Performance*
 147 *standard – Part 1: General and guidance*

148 IEC 61754 (all parts), *Fibre optic interconnecting devices and passive components - Fibre optic*
 149 *connector interfaces*

150 IEC 61755-2-4, *Fibre optic interconnecting devices and passive components - Connector optical*
 151 *interfaces - Part 2-4: Connection parameters of non-dispersion shifted single-mode physically*
 152 *contacting fibres - Non-angled for reference connection applications*

153 IEC 61755-2-5, *Fibre optic interconnecting devices and passive components - Connector optical*
 154 *interfaces - Part 2-5: Connection parameters of non-dispersion shifted single-mode physically*
 155 *contacting fibres - Angled for reference connection applications*

156 IEC TS 62627-09, *Fibre optic interconnecting devices and passive components - Vocabulary*
 157 *for passive optical devices*

158 **3 Terms and definitions**

159 For the purposes of this document, terms and definitions given in IEC 60869-1, IEC TS 62627-
 160 09 and the following apply.

161 ISO and IEC maintain terminological databases for use in standardization at the following
 162 addresses:

- 163 • IEC Electropedia: available at <http://www.electropedia.org/>
- 164 • ISO Online browsing platform: available at <http://www.iso.org/obp>

165 **3.1**

166 **plug-receptacle style single-mode fibre fixed optical attenuator**

167 single-mode fibre fixed optical attenuator which has an optical connector plug interface and an
 168 optical receptacle interface

169 **3.2**
 170 **attenuation tolerance**
 171 allowable attenuation differences from the nominal attenuation for fixed optical attenuators

172 Note 1 to entry: The attenuation tolerance is expressed in $\pm x$ dB.

173 4 Test conditions

174 Unless otherwise specified, all test methods are in accordance with the IEC 61300 series. Plug-
 175 receptacle style single-mode fibre fixed optical attenuators used for each test are intended to
 176 be previously unstressed new samples but may also be selected from previously used samples
 177 if desired. All measurements shall be carried out under standard atmospheric conditions, unless
 178 otherwise stated. Before the connection with optical connector plugs and adaptors for the test
 179 and the measurements of the optical performances, all optical connector plug end-faces shall
 180 be cleaned.

181 NOTE IEC 61300-3-35 [1]¹ defines the visual inspection of the end-face for optical connector plugs. IEC TR 62627-
 182 01 [2] describes the cleaning method of optical connectors.

183 Table 1 is intended to provide guidance on the wavelength ranges of the various spectral bands.
 184 It is not intended to serve as a specification. Values of operating wavelength used in
 185 performance verification shall be specified between the customer and the supplier or shall be
 186 as defined in the manufacturer's specification.

187 **Table 1 – Single-mode spectral bands**

Band	Descriptor	Range nm
O-band	Original	1 260 to 1 360
E-band	Extended	1 360 to 1 460
S-band	Short wavelength	1 460 to 1 530
C-band	Conventional	1 530 to 1 565
L-band	Long wavelength	1 565 to 1 625
U-band	Ultralong wavelength	1 625 to 1 675
NOTE This Table is based on ITU-T G. Supplement 39 [3].		

188 5 Test report

189 Fully documented test reports and supporting evidence shall be prepared and be available for
 190 inspection as evidence that the tests have been carried out and complied with.

191 6 Performance requirements

192 6.1 Dimensions

193 Dimensions of interfaces of an optical connector plug and an optical receptacle shall comply
 194 with IEC 61754 series as well as those given in appropriate manufacturers' drawings. When
 195 implementing this standard be aware that there have been problems when using a rigid interface
 196 component (without spring loaded ferrule) with SC plug style adaptors and plugs. See Clause
 197 6 of IEC TR 62627-02:2010 [4].

¹ The number in square bracket shows the bibliography number.