TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

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Passive components to be used in optical fibre communication systems - Product specifications - Part 2-1: SC(SC2)-PC connector-type fixed optical attenuators using IEC 60793-2 Category B1.1 singlemode fibre

Composants passifs destinés
à être utilisés dans les systèmes
de communication par fibres optiques -
Spécifications de produit -
Partie 2-1: Affaiblisseurs optiques fixes
de type connecteur SC(SC2)-PC utilisant
une fibre unimodale de la catégorie B1.1
de la CEI 60793-2

Passive Bauteile zur Verwendung
in Lichtwellenleiter-
Kommunikationssystemen -
Produktnormen -
Teil 2-1: Bauart SC(SC2)-PC
Steckverbinder mit optischem
Dämpfungsglied zum Anschluss
an Einmodenfasern der Kategorien B1.1
nach IEC 60793-2

This Technical Report was approved by CENELEC on 2008-06-20.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This Technical Report was prepared by the Technical Committee CENELEC TC 86BXA, Fibre optic interconnect, passive and connectorised components.

The text of the draft was circulated for voting in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 (simple majority) and was approved by CENELEC as CLC/TR 50378-2-1 on 2008-06-20.

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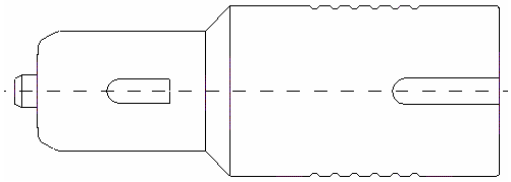
Passive components to be used in optical fibre communication systems –
Product specifications –
Part 2-1: SC(SC2)-PC connector-type fixed optical attenuators using IEC 60793-2 Category B1.1 singlemode fibre

Description		Performance	
Type:	fixed	Application:	EN 61753-1:2007, Category U
Style:	plug style		ES 201 286 (see 1.3)
Operating wavelength:	(1 260 - 1 360) nm and (1 460 - 1 625) nm	Attenuation:	1 dB, 5 dB and 15 dB
Coupling mechanism:	push pull		
Configuration:	plug-attenuator-adaptor-plug		
Fibre category:	special fibre	Return loss grade:	W: ≥ 45 dB

References:

EN 50377-4-4 [1)]	Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 4-4: Type SC-PC simplex terminated on IEC 60793-2-50 category B1.1, B1.3 and B6a singlemode fibre, with full zirconia ferrule Category U
EN 61300 series	Fibre optic interconnection devices and passive components - Basic test and measurement procedures (IEC 61300 series)
EN 61753-1	Fibre optic interconnecting devices and passive components performance standard - Part 1: General and guidance for performance standards (IEC 61753-1)
EN 61753-051-3	Fibre optic interconnecting devices and passive components performance standard - Part 051-3: Single-mode fibre, plug-style fixed attenuators for Category U - Uncontrolled environment (IEC 61753-051-3)
EN 61755-1	Fibre optic connector optical interfaces - Part 1: Optical interfaces for single mode non-dispersion shifted fibres - General and guidance (IEC 61755-1)
ETSI ES 201 286	Transmission and Multiplexing (TM); Passive optical components; Connector-type optical fixed attenuators for single-mode optical fibre communications systems; Common requirements and conformance testing
ETSI EN 300 019	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment

Outline:



[1)] At draft stage.

Contents

1 Scope

This document reports the measurement results of a round robin test program carried out on SC/PC plug style fixed attenuators. The work was initiated at CENELEC TC 86BXA meeting in June 2003 in order to get a clear understanding on the accuracy and repeatability of the spectral attenuation loss measurements on fixed attenuators.

Out of these results some recommendations are made for attenuation tolerance values that can be used in the performance standards.

2 Test samples

In total 18 SC/PC plug style fixed attenuators were collected for this round robin test:

- 6 attenuators with nominal attenuation of 15 dB (labelled 1, 2, 3, 4, 5 and 6);
- 6 attenuators with nominal attenuation of 5 dB (labelled 7, 8, 9, 10, 11 and 12);
- 6 attenuators with nominal attenuation of 1 dB (labelled 13, 14, 15, 16, 17 and 18).

The attenuators were obtained from various suppliers. The attenuating principle of all devices is based on the use of high attenuating fibre.

The performance grade of these attenuators is defined as:

- operating wavelength range: 1 260 nm-1 360 nm and 1 460 nm-1 580 nm;
- attenuation tolerance: 0,5 dB for attenuators ≤ 5 dB, 10 % of nominal attenuation value for attenuators > 5 dB.

3 Test program

All participating test laboratories measured spectral attenuation and polarisation dependent loss for each attenuator.

3.1 Spectral attenuation loss (according to EN 61300-3-5)

For the ease of the data processing the measured values were reported for the discrete wavelengths: 1 260 nm, 1 280 nm, 1 310 nm, 1 330 nm, 1 360 nm, 1 460 nm, 1 490 nm, 1 520 nm, 1 550 nm, 1 570 nm and 1 580 nm. The spectral width was set at 2 nm. Some laboratories also reported values with a spectral width of 10 nm. Each test laboratory performed the measurements with 2 sets of reference connectors and adapters:

- measurements with common reference connectors and adapter (same references for all the test laboratories);
- measurements with own test laboratory reference connectors and adapter.

Uncertainty of each loss measurement at the above mentioned wavelength range was better than 0,1 dB.

3.2 Polarisation dependent loss (PDL) (according to EN 61300-3-2, option 1)

PDL was measured at 1 310 nm and 1 550 nm, with common reference connectors. The accuracy of each PDL measurement was better than 0,1 dB.

4 Test laboratories involved in this RRT

The following laboratories were involved in this round robin test (in alphabetic order):

- Adamant Kogyo Co. Ltd (Japan);
- Diamond (Switzerland);
- Huber and Suhner (Switzerland);
- Telekomunikacja Polska (Poland);
- TILab (Telecom Italia Laboratories) (Italy);
- Tyco Electronics-AMP (the Netherlands);
- Tyco Electronics-Raychem (Belgium).