IEC 61753-085-2

Edition 1.0 2008-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components performance standard –
Part 085-2: Non-connectorized single-mode pigtailed CWDM devices for category C – Controlled environment

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-

Norme de qualité de fonctionnement des dispositifs d'interconnexion et composants passifs à fibres optiques –
Partie 085-2: Dispositifs CWDM à fibre amorce unimodale non connectorisés de catégorie C – Environnement contrôlé

IEC 61753-085-2:2008

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2008 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.
If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.
Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:
Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6c151e95feb1/iec-61753-085-2-2008

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: www.iec.ch/searchpub/cur_fut-f.htm

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,…). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: www.iec.ch/online_news/justpub

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: www.iec.ch/webstore/custserv/custserv_entry-f.htm

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:
Email: csc@iec.ch
Tél.: +41 22 919 02 11
Fax: +41 22 919 03 00

IEC 61753-085-2

Edition 1.0 2008-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components performance standard –
Part 085-2: Non-connectorized single-mode pigtailed CWDM devices for category C – Controlled environment

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-

Norme de qualité de fonctionnement des dispositifs d'interconnexion et composants passifs à fibres optiques –
Partie 085-2: Dispositifs CWDM à fibre amorce unimodale non connectorisés de catégorie C – Environnement contrôlé

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

N

ICS 33.180.10

ISBN 978-2-88910-557-1

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FOREWORD 3
1 Scope 5
2 Normative references 5
3 Test 6
4 Test report 6
5 Performance requirements 6
5.1 Reference components 6
5.2 Dimensions 6
5.3 Sample size and grouping 6
5.4 Test details and requirements 6
Annex A (normative) Sample size and grouping 13
Bibliography 14

Table 1 – Test details and requirements 7
Table A.1 – Sample size and grouping of tests 13

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6c15fe95feb1/iec-61753-085-2-2008

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS PERFORMANCE STANDARD –

Part 085-2: Non-connectorized single-mode pigtailed CWDM devices for category C – Controlled environment

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6c15fe9f2a67/iec-61753-085-2-2008

International Standard IEC 61753-085-2 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This bilingual version, published in 2009-01 corresponds to the English version.

The text of this standard is based on the following documents:

FDIS	Report on voting
86B/2703/FDIS	86B/2724/RVD

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

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61753 series, under the general title *Fibre optic interconnecting devices and passive components performance standards*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6c15fe95feb1/iec-61753-085-2-2008

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS PERFORMANCE STANDARD –

Part 085-2: Non-connectorized single-mode pigtailed CWDM devices for category C – Controlled environment

1 Scope

This part of IEC 61753 contains the minimum initial test and measurement requirements and severities which a fibre optic pigtailed coarse wavelength division multiplexing (CWDM) device needs to satisfy in order to be categorized as meeting the requirements of category C (controlled environments), as defined in Annex A of IEC 61753-1. CWDM is defined in IEC 62074-1.

2 Normative references

The following referenced documents are indispensable for the application 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4312f026-14c4-4950-bd76-6c125f05f0b1/iec-61753-085-2-2008

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

IEC 61300-2-14, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-14: Tests – Optical power handling and damage threshold characterization*

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

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

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

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

IEC 61300-2-42, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-42: Tests – Static side load for connectors*

IEC 61300-2-44, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-44: Tests – Flexing of the strain relief of fibre optic devices*

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 61300-3-7, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-7: Wavelength dependence of attenuation and return loss*

IEC 61300-3-20, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-20: Examinations and measurements – Directivity of fibre optic branching devices*

IEC 61300-3-29, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-29: Examinations and measurements – Measurement techniques for characterizing the amplitude of the spectral transfer function of DWDM components*

IEC 61753-1, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards*

3 Test

Unless otherwise specified, all test methods are in accordance with the relevant part of IEC 61300.

The samples shall be terminated onto single-mode fibres as per IEC 61753-1 in either coated fibres (primary and secondary) or reinforced cable format. All tests shall be carried out over the wavelength range defined by the customer's application; the complete CWDM wavelength range as defined in ITU-T Recommendation G.694.2 or a wider wavelength range such as from 1 250 nm to 1 650 nm may be used.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4 Test report

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

IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6a15fe95feb1/iec-61753-085-2-2008

5 Performance requirements

5.1 Reference components

The testing for these components does not require the use of reference components.

5.2 Dimensions

Dimensions shall comply with either an appropriate IEC interface standard or with those given in appropriate manufacturers drawings, where the IEC interface standard does not exist or cannot be used.

5.3 Sample size and grouping

Sample sizes for the tests are defined in Annex A of this standard.

Test groups shall be performed individually.

5.4 Test details and requirements

The requirements are given only for pigtailed WDM devices. For connectorized components, the connector performances shall be in compliance with IEC 61753-1.

Table 1 – Test details and requirements

No.	Test	Requirement	Details	
1	Centre wavelength (CWL) IEC 61300-3-7; IEC 61300-3-29	Centre wavelength: - channel 1: 1 271nm - channel 2: 1 291nm - channel 3: 1 311nm - channel 4: 1 331nm - channel 5: 1 351nm - channel 6: 1 371nm - channel 7: 1 391nm - channel 8: 1 411nm - channel 9: 1 431nm - channel 10: 1 451nm - channel 11: 1 471nm - channel 12: 1 491nm - channel 13: 1 511nm - channel 14: 1 531nm - channel 15: 1 551nm - channel 16: 1 571nm - channel 17: 1 591nm - channel 18: 1 611nm NOTE These wavelengths correspond to central wave-lengths as specified in ITU-T Recommendation ITU-G.694.2	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized The wavelength of the source shall be longer than cut-off wavelength of the fibre Test results should be obtained under measurement uncertainty of ± 0,05 nm
2	**Passband** IEC 61300-3-7; IEC 61300-3-29	CWL +/- 6,5 nm Passband is defined as 0,5 dB bandwidth. NOTE This passband corresponds to a maximum central wavelength deviation of ± 6,5 nm as specified in ITU-T Recommendation G.695	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized broadband light. The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under measurement uncertainty of ± 0,05 nm

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/431...-4950-bd76-...
...61753-085-2-2008

Table 1 *(continued)*

No.	Test	Requirement	Details	
3	Attenuation IEC 61300-3-7	Type A: ≤ 1,4 dB (1-channel device) ≤ 2,1 dB (4-channel device) ≤ 2,8 dB (8-channel device) ≤ 3,5 dB (12-channel device) ≤ 4,3 dB (16-channel device) Type B: ≤ 1,7 dB (1-channel device) ≤ 2,7 dB (4-channel device) ≤ 4,0 dB (8-channel device) ≤ 5,3 dB (12-channel device) ≤ 6,1 dB (16-channel device)	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under measurement uncertainty of ± 0,1 dB
4	Total channel isolation IEC 61300-3-7; IEC 61300-3-29	≥ 30 dB	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized. The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under measurement uncertainty of ± 1 dB
5	Ripple IEC 61300-3-7; IEC 61300-3-29	Type A: ≤ 0,3 dB Type B: ≤ 0,5 dB	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized. The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under measurement uncertainty of ± 0,05 dB
6	Channel non-uniformity IEC 61300-3-7; IEC 61300-3-29	≤ 1,0 dB (4-channel device) ≤ 1,5 dB (8-channel device) ≤ 2,0 dB (12-channel device) ≤ 2,5 dB (16-channel device)	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized. The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under non measurement uncertainty of ± 0,1 dB. Depending on applications, channel non-uniformity may not be required. This needs then to be agreed between the buyer and the supplier
7	Out-of-band attenuation IEC 61300-3-7; IEC 61300-3-29	≥ 20 dB; over the complete wavelength range	Launch patchcord length: Source type: Launch conditions: Other requirements:	≥ 2 m Unpolarized . The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results should be obtained under measurement uncertainty of ± 1 dB

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-b0b5-6c15fe95feb1/iec-61753-085-2-2008

Table 1 *(continued)*

No.	Test	Requirement	Details	
8	Directivity IEC 61300-3-20	>= 50 dB Grade U; within the passband	Source: Other requirements	LD Test results should be obtained under measurement uncertainty of ± 1 dB. All ports not under test shall be terminated to avoid unwanted reflections contributing to the measurement. The directivity shall be measured between any pair of input or output ports. NOTE Because of the high cost of this test, the buyer and manufacturer may agree to discard it. However, the potential negative effect of this parameter on system performance must not be neglected
9	Return loss IEC 61300-3-6	>= 50 dB Grade U; over the complete wavelength range	Source: Other requirements:	LD Test results should be obtained under measurement uncertainty of ± 1 dB. All ports not under test shall be terminated to avoid unwanted reflections contributing to the measurement. NOTE Because of the high cost of this test, the buyer and manufacturer may agree to discard it. However, the potential negative effect of this parameter on system performance must not be neglected
10	Polarization dependent loss (PDL) IEC 61300-3-2	≤ 0,2 dB	Launch patchcord length: Source type: Other requirements:	≥ 2 m LD Test results should be obtained under measurement uncertainty of ± 0,05 dB

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd79-6c15fe95feb1/iec-61753-085-2-2008

Table 1 *(continued)*

No.	Test		Requirement	Details
11	Optical power handling and damage threshold characterization IEC 61300-2-14 IEC 61300-3-3	During the test the attenuation limits of test no. 3 shall be met. Moreover, during and on completion of the test, the attenuation shall be within ± 0,3 dB of original value under ambient environmental conditions. On completion of the test the return loss limits of test no. 9 shall be met. On completion of the test the total channel isolation limits of test no. 4 shall be met	Source type Max. total input power to be applied:: Max. channel input power to be applied: Power increments: Test duration: Other requirements:	LD + 20 dBm + 6 dBm 3 dB 30 min at each power level. Test results should be obtained under attenuation measurement uncertainty of ± 0,1 dB. Test results should be obtained under return loss measurement uncertainty of ± 1 dB
12	Cold IEC 61300-2-17 IEC 61300-3-3	During the test the attenuation limits of test no. 3 shall be met. Moreover, during and on completion of the test, the attenuation shall be within ± 0,3 dB of original value under ambient conditions. During the test the return loss limits of test no. 9 shall be met. On completion of the test the Wavelength Isolation limits of test no. 4 shall be met	Temperature: Duration of the exposure: Maximum sampling interval during the test: Measurements required:	- 10 °C ± 2 °C 96 h 1 h Attenuation shall be measured before, during and after the test. Return loss shall be measured before, during and after the test
13	Dry heat – high temperature endurance IEC 61300-2-18 IEC 61300-3-3	During the test the attenuation limits of test no. 3 shall be met. Moreover, during and on completion of the test, the attenuation shall be within ± 0,3 dB of original value under ambient conditions. During the test the return loss limits of test no. 9 shall be met. On completion of the test the Wavelength Isolation limits of test no. 4 shall be met	Temperature: Duration of the exposure: Maximum sampling interval during the test: Measurements required:	+ 60 °C ± 2 °C 96 h 1 h Attenuation shall be measured before, during and after the test. Return loss shall be measured before, during and after the test

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 61753-085-2:2008
https://standards.iteh.ai/catalog/standards/sist/4313f026-14c4-4950-bd76-6c15fe95feb1/iec-61753-085-2-2008