IEC 61753-041-2

Edition 1.0 2014-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Fibre optic interconnecting devices and passive components – Performance standard –
Part 041-2: Non-connectorized single-mode OTDR reflecting device for category C – Controlled environment

Dispositifs d'interconnexion et composants passifs à fibres optiques – Norme de performance –
Partie 041-2: Dispositif de réflexion pour OTDR unimodal non connectorisé pour la catégorie C – Environnement contrôlé

IEC 61753-041-2:2014-05(en-fr)

AVA Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2014 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 l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
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.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) 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 IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

IEC 61753-041-2

Edition 1.0 2014-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Fibre optic interconnecting devices and passive components – Performance standard –
Part 041-2: Non-connectorized single-mode OTDR reflecting device for category C – Controlled environment

Dispositifs d'interconnexion et composants passifs à fibres optiques – Norme de performance –
Partie 041-2: Dispositif de réflexion pour OTDR unimodal non connectorisé pour la catégorie C – Environnement contrôlé

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8322-5007-5

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

AVA Documents
Document Sharing Hub

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

Full document details: IEC 61753-041-2 2014

CONTENTS

FOREWORD ... 3
1 Scope ... 5
2 Normative references ... 5
3 Terms, definitions and abbreviations ... 6
3.1 Terms and definitions ... 6
3.2 Abbreviations ... 7
4 Test ... 7
5 Test report ... 7
6 Performance requirements ... 8
6.1 Reference components ... 8
6.2 Dimensions ... 8
6.3 Sample size ... 8
6.4 Test details and requirements ... 8
Annex A (normative) Sample size ... 13
Annex B (informative) General information for OTDR reflecting device ... 14
Bibliography ... 18

Figure B.1 – Functional principle of an OTDR reflecting device ... 14
Figure B.2 – Example for OTDR monitoring using connector as coating support ... 14
Figure B.3 – Example for OTDR monitoring using NWBD ... 15
Figure B.4 – Example for OTDR monitoring using WDM ... 15
Figure B.5 – Example for OTDR monitoring using FBG ... 15
Figure B.6 – Example for OTDR monitoring using collimator based TFF ... 16
Figure B.7 – Example for OTDR monitoring using waveguides and TFF ... 16
Figure B.8 – Example for OTDR monitoring using direct coupled TFF ... 16
Figure B.9 – Example of the integration of OTDR monitoring for a PTP network ... 17
Figure B.10 – Example of the integration of OTDR monitoring for a PTMP network ... 17

Table 1 – Test details and requirements *(1 of 5)* ... 8
Table A.1 – Sample size ... 13

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – PERFORMANCE STANDARD –

Part 041-2: Non-connectorized single-mode OTDR reflecting device 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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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.

International Standard IEC 61753-041-2 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components of IEC technical committee 86: Fibre optics.

This bilingual version (2017-11) corresponds to the monolingual English version, published in 2014-05.

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

FDIS	Report on voting
86B/3750/FDIS	86B/3778/RVD

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

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 stability 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – PERFORMANCE STANDARD –

Part 041-2: Non-connectorized single-mode OTDR reflecting device for category C – Controlled environment

1 Scope

This part of IEC 61753 contains the minimum initial performance, test and measurement requirements and severities which a fibre optic non-connectorized OTDR reflecting device for monitoring point to point (PTP) or point to multipoint (PTMP) passive optical networks (PON) using an optical time-domain reflectometer (OTDR) should satisfy in order to be categorized as meeting the requirements of category C (controlled environments), as defined in Annex A of IEC 61753-1:2007.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

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

IEC 61300-2-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-4: Tests – Fibre/cable retention*

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

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

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*

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

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

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

IEC 61753-1:2007, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance*

IEC 62074-1, *Fibre optic WDM devices – Part 1: Generic specification*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in IEC 62074-1, apply.

3.1.1
OTDR reflecting device
wavelength-selective reflecting device having two ports that light from the signal wavelength ranges transmits from the first port to the second port and OTDR light from the OTDR wavelength range launched into one port is (partly) reflected back to that launch port

Note 1 to entry: Annex B of this standard provides information concerning the function of the OTDR reflecting device.

3.1.2
Type A of OTDR reflecting device
OTDR reflecting device with low attenuation

Note 1 to entry: Examples are shown in Figures B.2, B.5, B.6, B.7 and B.8 of Annex B.

3.1.3
Type B of OTDR reflecting device
OTDR reflecting device with higher attenuation

Note 1 to entry: Examples are shown in Figures B.3 and B.4 of Annex B.

Documents
Document Sharing Hub
Full document details: IEC 61753-041-2 2014

3.2 Abbreviations

Abbreviations in order of appearance:

OTDR: Optical time-domain reflectometer
PTP: Point to point
PTMP: Point to multipoint
PON: Passive optical network
GPON: Gigabit-capable passive optical network
PMD: Physical media dependent
CSMA: Carrier sense multiple access
CD: Collision detection
CO: Central office
NWBD: Non-wavelength-selective branching device
HRD: High reflection device
WDM: Wavelength division multiplexer
FBG: Fibre bragg grating
TFF: Thin film filter

4 Test

Unless otherwise specified, all test methods are in accordance with the IEC 61300 series. Each test defines the number of samples to be evaluated. The samples used for each test are intended to be previously unstressed new samples but may also be selected from previously used samples if desired. The samples shall be terminated onto single-mode fibres as per IEC 60793-2-50 category B 1.1, B 1.3 or B 6 in either coated fibres (primary and secondary) or reinforced cable format. All measurements shall be carried out at atmosphere conditions defined in IEC 61300-1, unless otherwise stated.

All tests shall be carried out over the operating wavelength range listed below:

1) Signal wavelength ranges:
   1 260 nm to 1 360 nm;
   1 480 nm to 1 500 nm;
   1 550 nm to 1 560 nm.
2) OTDR wavelength ranges:
   1 620 nm to 1 630 nm;
   1 645 nm to 1 655 nm;

unless otherwise specified.

NOTE 1 310 nm, 1 490 nm and 1 550 nm are the nominal or centre wavelengths, stated for the ranges 1 260 nm to 1 360 nm, 1 480 nm to 1 500 nm and 1 550 nm to 1 560 nm as defined in ITU-T Recommendations G.983.3 and G.984.2 and IEEE 802.3ah-2004.

5 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.

Documents
Document Sharing Hub

Full document details: IEC 61753-041-2 2014

6 Performance requirements

6.1 Reference components

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

6.2 Dimensions

Dimensions shall comply with those given in appropriate manufacturer's drawings.

6.3 Sample size

Sample sizes for the tests are defined in Annex A.

6.4 Test details and requirements

Table 1 – Test details and requirements *(1 of 5)*

No.	Test	Requirement	Details	
1	Attenuation (insertion loss) IEC 61300-3-7	Type A: ≤ 0,5 dB Type B: ≤ 1,0 dB Attenuation (insertion loss) shall be met over the operating wavelength range	Launch patch cord length: Polarization state of light source: Launch conditions: Measurement uncertainty:	≥ 2 m Unpolarized The wavelength of the source shall be longer than cut-off wavelength of the fibre. Test results shall be obtained under measure-ment uncertainty of ± 0,1 dB
2	Wavelength Isolation IEC 61300-3-7	≥ 20 dB between signal wavelength ranges and OTDR wavelength range	Launch patch cord length: Polarization state of light source: Launch conditions: Measurement uncertainty:	≥ 2 m Unpolarized The wavelength of the source shall be longer than cut-off wavelength of the fibre Test results shall be obtained under measurement uncertainty of ± 1 dB
3	Return loss IEC 61300-3-7	Grade S1: ≥ 26 dB for signal wavelength range(s) for both input and output ports and ≤ 10 dB for OTDR wavelength range for input port only. Grade S2: ≥ 26 dB for operating signal range(s) for both input and output ports and ≤ 1,5 dB for OTDR wavelength range for input port only. Grade T1: ≥ 35 dB for signal wavelength range(s) for both input and output ports and ≤ 5 dB for OTDR wavelength range for input port only. Grade T2: ≥ 35 dB for signal wavelength range(s) for both input and output ports and ≤ 0,5 dB for OTDR wavelength range for input port only	Source type: Measurement uncertainty: Other requirements:	Laser diode (LD) Test results shall be obtained under measurement uncertainty of ± 0,05 dB for RL < 0,5 dB, of ± 0,2 dB for RL < 1,5 dB, of ± 0,5 dB for RL < 5 dB, of ± 1 dB for RL ≥ 5 dB. All ports not under test shall be terminated to avoid unwanted reflections contributing to the measurement

Documents
Document Sharing Hub
Full document details: IEC 61753-041-2 2014

Table 1 *(2 of 5)*

No.	Test	Requirement	Details	
4	Polarization dependent loss (PDL) IEC 61300-3-2	≤ 0,2 dB Polarization dependent loss shall be met over the operating wavelength range	Launch patch cord length: Source type: Test wavelengths: Measurement uncertainty:	≥ 2 m Laser diode (LD) 1 310 nm ± 20 nm 1 550 nm ± 20 nm Test results shall be obtained under measurement uncertainty of ± 0,05 dB
5	High optical power IEC 61300-2-14	≥ 300mW (sum of power at the wavelength ranges at the same time) During and on completion of the test the insertion loss limits of test No. 1 shall be met After the test the wavelength isolation limits of test No. 2 shall be met During and on completion of the test the return loss limits of test No. 3 shall be met	Source type Max. power to be applied at wavelength ranges 1 550 nm to 1 560 nm and 1 620 nm to 1 630 nm (1 645 nm to 1 655 nm): Max. power to be applied at wavelength ranges 1 480 nm to 1 500 nm and 1 260 nm to 1 360 nm: Measurement uncertainty:	Laser diode (LD) 300 mW (+ ~25 dBm) 10 mW (+ 10 dBm) Test results shall be obtained under insertion loss measurement uncertainty of ± 0,1 dB. Test results shall be obtained under return loss measurement uncertainty of ± 0,05 dB for RL < 0,5 dB, of ± 0,2 dB for RL < 1,5 dB, of ± 0,5 dB for RL < 5 dB, of ± 1 dB for RL ≥ 5dB
6	Cold IEC 61300-2-17	After the test the insertion loss limits of test No. 1 shall be met. In addition the change of insertion loss during the test shall be within ± 0,3 dB from the initial value. After the test the wavelength isolation limits of test No. 2 shall be met. During and on completion of the test the return loss limits of test No. 3 shall be met	Temperature: Duration of the exposure: Maximum sampling interval during the test: Measurements required:	–10 °C ± 2 °C 96 h 1 h Insertion loss shall be measured before, during and after the test. Return loss shall be measured before, during and after the test

Documents
Document Sharing Hub
Full document details: IEC 61753-041-2 2014

Table 1 *(3 of 5)*

No.	Test	Requirement	Details	
7	Dry heat – High temperature endurance IEC 61300-2-18	After the test the insertion loss limits of test No. 1 shall be met In addition the change of insertion loss during the test shall be within ± 0,3 dB from the initial value After the test the wavelength isolation limits of test No. 2 shall be met During and on completion of the test the return loss limits of test No. 3 shall be met	Temperature: Duration of the exposure: Maximum sampling interval during the test: Measurements required:	+ 60 °C ± 2 °C 96 h 1 h Insertion loss shall be measured before, during and after the test. Return loss shall be measured before, during and after the test
8	Change of temperature IEC 61300-2-22	After the test the insertion loss limits of test No. 1 shall be met In addition the change of insertion loss during the test shall be within ± 0,3 dB from the initial value After the test the wavelength isolation limits of test No. 2 shall be met During and on completion of the test the return loss limits of test No. 3 shall be met	High temperature: Low temperature: Number of cycles: Rate of temperature change: Duration at extreme temperatures: Maximum sampling interval during the test: Measurements required:	+ 60 °C ± 2 °C –10 °C ± 2 °C 5 1 °C/min 1 h 10 min Insertion loss shall be measured before, during and after the test. Return loss shall be measured before, during and after the test
9	Damp heat (steady state) IEC 61300-2-19	After the test the insertion loss limits of test No. 1 shall be met. In addition the change of insertion loss during the test shall be within ± 0,3 dB from the initial value. After the test the wavelength isolation limits of test No. 2 shall be met. During and on completion of the test the return loss limits of test No. 3 shall be met.	Temperature: Humidity: Duration of the exposure: Maximum sampling interval during the test: Measurements required:	+ 40 °C ± 2 °C 93 % RH + 2 % RH, – 3 % RH 96 h 1 h Insertion loss shall be measured before, during and after the test. Return loss shall be measured before, during and after the test

Documents
Document Sharing Hub
Full document details: IEC 61753-041-2 2014

Table 1 *(4 of 5)*

No.	Test	Requirement	Details	
10	Vibration IEC 61300-2-1	After the test the insertion loss limits of test No. 1 shall be met. After the test the wavelength isolation limits of test No. 2 shall be met. After the test the return loss limits of test No. 3 shall be met	Frequency range: Constant vibration amplitude: Number of cycles (10 Hz – 55 Hz -10 Hz): Frequency change: Number of axes: Measurements required:	10 Hz – 55 Hz 0,75 mm 15 1 octave/min 3 orthogonal Insertion loss shall be measured before and after the test. Return loss shall be measured before and after the test
11	Shock IEC 61300-2-9	After the test the insertion loss limits of test No. 1 shall be met. After the test the wavelength isolation limits of test No. 2 shall be met. After the test the return loss limits of test No. 3 shall be met	Acceleration force: Number of axes: Duration shock: Pulse: Number of shocks: Measurements required:	5 000 m/s^2 3 main axes, perpendicular to each other 1 ms Half sine 2 per axis Insertion loss shall be measured before and after the test. Return loss shall be measured before and after the test
12	Fibre/cable retention IEC 61300-2-4	After the test the insertion loss limits of test No. 1 shall be met. After the test the wavelength isolation limits of test No. 2 shall be met. After the test the return loss limits of test No. 3 shall be met	Magnitude of the load: Load application point: Load rate: Duration of the load: Measurements required:	10 N ± 1 N for reinforced cable. 5,0 N ± 0,5 N for secondary coated fibre. 2,0 N ± 0,2 N for primary coated fibre. 0,3 m from the end of device. 5 N/s for reinforced cable. 0,5 N/s for coated fibre. 120 s at 10 N 60 s at 5 N and 2 N Insertion loss shall be measured before and after the test. Return loss shall be measured before and after the test

AVA Documents
Document Sharing Hub
Full document details: IEC 61753-041-2 2014