IEC 61300-2-47

Edition 3.0 2010-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

withdrawn

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-47: Tests – Thermal shocks

Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 2-47: Essais – Chocs thermiques

IEC 61300-2-47:2010

Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2010 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 It also gives information on projects, withdrawn and replaced publications.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

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

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

IEC 61300-2-47

Edition 3.0 2010-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Withdrawn

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-47: Tests – Thermal shocks

Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 2-47: Essais – Chocs thermiques

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX **K**

ICS 33.180.20

ISBN 978-2-88912-213-4

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

Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

CONTENTS

FOREWORD 3
1 Scope 5
2 Normative references 5
3 General description 5
4 Apparatus 5
4.1 Testing chambers 5
4.2 Support for mounting the test specimens 6
5 Procedure 6
5.1 General 6
5.2 Preconditioning 6
5.3 Initial measurements 6
5.4 Testing 6
5.5 Recovery 7
5.6 Final measurements 7
6 Severity 7
7 Details to be specified 8
Annex A (informative) Minimum temperature value in Finland 9
Bibliography 10

Figure 1 – Temperature change cycle 7

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-47: Tests – Thermal shocks

Withdrawn

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 61300-2-47 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2006. It constitutes a technical revision. The significant changes include the review of the test severity.

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

FDIS	Report on voting
86B/3069/FDIS	86B/3101/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.

AVA Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

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

The reader's attention is drawn to the fact that Annex A lists an "in some-country" clause on differing practices of a less permanent nature relating to the subject of this standard.

A list of all parts of the IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures,* 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.

The contents of the corrigendum of April 2011 have been included in this copy.

withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61300-2-47 2010

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-47: Tests – Thermal shocks

Withdrawn

1 Scope

This part of IEC 61300 details a procedure for determining the suitability of a fibre optic device to withstand the effects of thermal shock. In practice this means a very short change over time between extreme temperatures.

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.

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

3 General description

This procedure is conducted in accordance with IEC 60068-2-14, test Na. The device under test (DUT) is first subjected to one extreme of temperature for a given period of time. It is then subjected to the other extreme of temperature for an equal period of time.

Two test methods are considered: manual or automatic. Both methods are considered as equivalent. The reference method is the automatic one.

4 Apparatus

4.1 Testing chambers

a) Two separate chambers or one rapid temperature change rate may be used. If two chambers are used, one for the low temperature and one for the high temperature, they are located such as to allow transfer of the DUT from one chamber to the other within the prescribed time. Either manual and automatic transfer methods may be used.

b) The chambers shall be capable of maintaining the atmosphere at the appropriate temperature for the test in any region where the DUT is placed.

c) The absolute humidity of the atmosphere inside the chambers should not exceed 20 g/m^3.

NOTE At the temperature of 60 °C and standard air pressure the relative humidity should be less than 16 %.

d) The temperature of the walls of the hot and cold chambers shall not differ by more than 3 % and 8 % respectively from the specified ambient temperature of the test, expressed in Kelvin.

e) The volume of the chambers and the air velocity shall be such that after insertion of the DUT, the temperature of the atmosphere shall be within the specified tolerance after a time of not more than 10 % of the exposure time.

AVA Documents Document Sharing Hub

Full document details: IEC 61300-2-47 2010

f) The air of the chamber shall be circulated so that the air velocity, measured close to the test specimen, shall be not less than 2 m/s.

4.2 Support for mounting the test specimens

Unless otherwise specified in the relevant specifications, the thermal conductivity of the supports for mounting the specimens shall be low, such that for practical purposes the specimen is thermally isolated. When testing several specimens simultaneously, they shall be so placed that free circulation should be provided between specimens, and between specimens and chamber surfaces.

5 Procedure

5.1 General

Conduct the test according to the following procedure.

Unless otherwise stated in the relevant specification, the following applies.

– If the component construction includes optical leads, include 1,5 m of cable in the climatic chamber for each port monitored during the test.

– If optical measurements are requested during the test by the relevant specification, these measurements shall be performed at a maximum interval of 10 min during the extreme temperature periods.

– It is not the intention of the test to record the effects of mechanical movement of the optical cables during the movement of the DUT from one environmental chamber to the other. Therefore the physical arrangement of the cables shall ensure that movement of the DUT does not affect the optical transmission. To verify this, optical cables similar to those attached to the DUT shall be positioned alongside the cables attached to the DUT and monitored throughout the test as a control.

5.2 Preconditioning

Unless otherwise stated in the relevant specification, maintain the DUT under standard atmospheric conditions for a minimum of 2 h. Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's instructions.

5.3 Initial measurements

Complete initial examinations and measurements as required by the relevant specification.

5.4 Testing

a) Place the DUT in the chamber in its normal operating position and make connections to the monitoring equipment.

b) The device shall be subjected to a temperature cycle according to Figure 1.

c) The DUT shall be placed in the cold chamber, the atmosphere of which has been previously adjusted to the appropriate low temperature T_A. The atmosphere in the cold chamber shall be maintained at the low temperature T_A for the appropriate period t_1 (t_1 includes an initial time for temperature stabilization of atmosphere, according to 4.1e).

d) The DUT shall then be removed from the cold chamber and transferred to the hot chamber in a changeover time t_2 not more than 3 min. In the case of automatic two-chamber test equipment, a changeover period shall be of less than 30 s. The transition time shall include the time of removal from one chamber and the insertion into the second chamber as well as any dwell time at the ambient temperature of the laboratory.

e) The atmosphere in the hot chamber shall be maintained at the high temperature T_B for the appropriate period t_1.

Withdrawn

AVA Documents Document Sharing Hub

Full document details: IEC 61300-2-47 2010