

# INTERNATIONAL STANDARD



---

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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 33.180.20

ISBN 978-2-8322-3770-0

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	3
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 General description .....	7
5 Apparatus.....	7
5.1 Shock machine .....	7
5.1.1 General .....	7
5.1.2 Repetition rate .....	8
5.1.3 Velocity change tolerances .....	8
5.1.4 Cross axis motion .....	8
5.1.5 Acceleration measuring system .....	8
5.2 Mounting fixture .....	9
5.3 Optical power measuring equipment .....	9
6 Procedure.....	9
6.1 Preparation of DUT .....	9
6.2 Pre-conditioning.....	10
6.3 Initial examinations and measurements.....	10
6.4 Testing .....	10
6.5 Recovery .....	10
6.6 Final examination and measurements .....	10
7 Shock severity .....	11
8 Details to be specified .....	11
Bibliography.....	12
Figure 1 – Fixing points .....	6
Figure 2 – Pulse shape and limits of tolerance for half-sine pulse .....	7
Figure 3 – Frequency characteristics of the overall measuring system without low-pass filter .....	9
Table 1 – Required frequency characteristic values for the overall measuring system.....	9
Table 2 – Severity for passive components and modules .....	11
Table 3 – Severity for fibre management systems and closures .....	11

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING  
DEVICES AND PASSIVE COMPONENTS –  
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-9: Tests – Shock**

## 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 61300-2-9 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 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) inserted clause "Terms and definitions";
- b) added precise descriptions to clause "Apparatus";
- c) added sub clause "Testing" into clause "Procedure";
- d) added "Bibliography".

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

CDV	Report on voting
86B/3979/CDV	86B/4017/RVC

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.

A list of all parts in the IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components*, can be found on the IEC website.

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

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

A bilingual version of this publication may be issued at a later date.

**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.**

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

## **Part 2-9: Tests – Shock**

### **1 Scope**

This part of IEC 61300 defines a test method to reveal mechanical weakness and/or degradation of fibre optic devices when subjected to repetitive or non-repetitive mechanical shocks. It simulates infrequent repetitive or non-repetitive shocks likely to be encountered in normal service or during transportation.

### **2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60068-1, *Environmental testing – Part 1: General and guidance*

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

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

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

ISO 2041, *Mechanical vibration, shock and condition monitoring – Vocabulary*