



BSI Standards Publication

Fibre optic interconnecting devices and passive components

Part 03-04: Reliability — Guideline for high power reliability of passive optical components

National foreword

This Published Document is the UK implementation of IEC/TR 62627-03-04:2013.

The UK participation in its preparation was entrusted by Technical Committee GEL/86, Fibre optics, to Subcommittee GEL/86/2, Fibre optic interconnecting devices and passive components.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.
Published by BSI Standards Limited 2013

ISBN 978 0 580 78385 2
ICS 33.180.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2013.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------



TECHNICAL REPORT

**Fibre optic interconnecting devices and passive components –
Part 03-04: Reliability – Guideline for high power reliability of passive optical
components**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

P

ICS 33.180.20

ISBN 978-2-8322-1160-1

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

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Generic information	6
4 Procedures for confirmation of high power reliability	7
5 Risk analysis under high power conditions.....	7
5.1 Example of risk under high power conditions.....	7
5.2 Preparation of risk analysis table	8
5.3 Estimation of failure modes and determination of test conditions.....	9
6 Step-stress test	9
6.1 General.....	9
6.2 Test set-up	9
6.3 Test condition	10
6.3.1 Duration time of step-stress test	10
6.3.2 Test temperature	10
6.3.3 Pass/fail criteria.....	10
6.3.4 Performance monitoring.....	10
6.3.5 Test wavelengths of light source.....	10
6.3.6 Test power.....	11
6.3.7 Sample size	11
6.3.8 Coherency of light source	11
7 Analysis of step-stress test result	11
7.1 Estimate and identify the failure mechanism	11
7.2 Estimate the maximum input power for guaranteeing long-term reliability.....	11
8 Long-term test	12
9 Reliability under high power conditions	12
10 Test report.....	13
Annex A (informative) Examples of high power risk analysis table for optical passive components	14
Figure 1 – Test set-up of high power step-stress test (example).....	10
Table 1 – Typical risks of materials on high power input condition	8
Table 2 – Format of high power risk analysis table.....	9
Table A.1 – High power risk analysis table for metal-doped, fibre plug-style fixed optical attenuators	14
Table A.2 – High power risk analysis table for in-line optical isolators	14
Table A.3 – High power risk analysis table for planer waveguide type optical splitters	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS –

Part 03-04: Reliability – Guideline for high power reliability of passive optical components

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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC/TR 62627-03-04, which is a technical report, has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive optical components, of IEC technical committee 86: Fibre optics.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
86B/3641/DTR	86B/3676/RVC

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

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

A list of all the parts in the IEC 62627 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 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

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