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Fibre optic interconecting devices and passive components – Part 03-03: Reliability – Report on high-power reliability for metal-doped optical fibre plug-style optical attenuators

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC 62627-03-03, which is a technical report, has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive 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/3458/DTR	86B/3506/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 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- withdrawn,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.

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INTRODUCTION

Since 2000, the optical power in transmission systems has increased in conjunction with the increase in the number of channels for DWDM systems, with the help of deployment of RAMAN amplifiers and application of optical amplifiers. It is pointed out, however, that the transmission media of the optical transmission system such as the optical fibre, optical connector and optical passive components may sometimes be hazardous because of possible leakage of high-power light that results in personal injury, melting, or a damage possibly causing a fire.

IEC Japan National Committee (JPNC) and Optoelectronics Industry and Technology Development Association (OITDA) carried out the research on the high-power reliability and safety of optical passive components. The result was summarized in the OITDA Technical paper, TP04/SP-PD-2008 “Study on the High-Power Reliability of Optical Passive Parts for Communications.” IEC/TR 62627-03-02 was published based on the above report. According to that report, deterioration of optical passive components at high-power input is caused by temperature rise due to absorption of light as well as consequential thermal distortion. It was decided to undertake additional research whilst utilizing these findings, specifically on the plug style optical attenuator, whose resistance against high-power is relatively small. The study result was summarized in OITDA TP, TP09/SP-PD-2010.

This technical report was prepared on the basis of OITDA TP, TP09/SP-PD-2010,“*Technical paper of investigation of high-power reliability for plug-style fixed optical attenuators*”.

FIBRE OPTIC INTERCONECTING DEVICES AND PASSIVE COMPONENTS –

Part 03-03: Reliability – Report on high-power reliability for metal-doped optical fibre plug-style optical attenuators

1 Scope

IEC/TR 62627-03-03, which is a technical report, describes the investigation results of high-power reliability for metal-doped optical fibre plug-style attenuators.

This report contains the high-power test results for metal-doped optical fibre SC plug-style optical attenuators, the thermal simulation results and the analysis of degradation modes, long-term reliability test results under high-power conditions and the derivation of maximum limit of optical power for guaranteeing long-term operation.

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/TR 62627-03-02, *Fibre optic interconnecting devices and passive components – Part 03-02: Reliability – Report of high-power transmission test of specified passive optical components*