

**Optical amplifier test methods - Part 11-1:
Polarization mode dispersion - Jones matrix
eigenanalysis method (JME)**

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mode dispersion - Jones matrix eigenanalysis method
(JME)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 61290-11-1:2008 sisaldab Euroopa standardi EN 61290-11-1:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 26.09.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 14.08.2008.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 61290-11-1:2008 consists of the English text of the European standard EN 61290-11-1:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 26.09.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 14.08.2008.

The standard is available from Estonian standardisation organisation.

ICS 33.180.30

Võtmesõnad:

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

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Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
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English version

**Optical amplifiers -
Test methods -
Part 11-1: Polarization mode dispersion parameter -
Jones matrix eigenanalysis (JME)
(IEC 61290-11-1:2008)**

Amplificateurs optiques -
Méthodes d'essais -
Partie 11-1: Paramètre de dispersion
du mode de polarisation -
Analyse des vecteurs propres
de la matrice de Jones (JME)
(CEI 61290-11-1:2008)

Prüfverfahren für
Lichtwellenleiter-Verstärker -
Teil 11-1: Polarisationsmoden-
dispersionsparameter -
Jones-Matrix-Eigenanalyse (JME)
(IEC 61290-11-1:2008)

This European Standard was approved by CENELEC on 2008-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 86C/752/CDV, future edition 2 of IEC 61290-11-1, prepared by SC 86C, Fibre optic systems and active devices, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel Unique Acceptance Procedure and was approved by CENELEC as EN 61290-11-1 on 2008-06-01.

This European Standard supersedes EN 61290-11-1:2003.

EN 61290-11-1:2008 specifically addresses additional types of optical amplifiers and also includes updated references.

The following dates were fixed:

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|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2009-03-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2011-06-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61290-11-1:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60793-1-1	NOTE Harmonized as EN 60793-1-1:2003 (not modified).
IEC 60825-1	NOTE Harmonized as EN 60825-1:2007 (not modified).
IEC 60825-2	NOTE Harmonized as EN 60825-2:2004 (not modified).
IEC 60874-1	NOTE Harmonized as EN 60874-1:2007 (not modified).
IEC 61291-1	NOTE Harmonized as EN 61291-1:2006 (not modified).
IEC 61291-4	NOTE Harmonized as EN 61291-4:2003 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TR 61282-9	2006	Fibre optic communication system design guides - Part 9: Guidance on polarization mode dispersion measurements and theory	—	—
IEC/TR 61292-5	2004	Optical amplifiers - Part 5: Polarization mode dispersion parameter - General information	—	—

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OPTICAL AMPLIFIERS – TEST METHODS –

Part 11-1: Polarization mode dispersion parameter – Jones matrix eigenanalysis (JME)

1 Scope and object

This part of IEC 61290 applies to all commercially available optical amplifiers (OAs), including optical fibre amplifiers (OFAs) using active fibres, semiconductor optical amplifiers (SOAs), and planar waveguide optical amplifiers (PWOAs).

Polarization-mode dispersion (PMD) causes an optical pulse to spread in the time domain. This dispersion could impair the performance of a telecommunications system. The effect can be related to differential group velocity and corresponding arrival times of different polarization components of the signal. For a narrowband source, the effect can be related to a differential group delay (DGD) between pairs of orthogonally polarized principal states of polarization (PSP). Other information about PMD may be found in IEC 61282-9 in general and in IEC 61292-5 on OAs in particular.

This test method describes a procedure for measuring the PMD of OAs. The measurement result is obtained from the measurement of the normalized Stokes parameters at two closely spaced wavelengths.

The test method described herein requires a polarized signal at the input of the polarimeter with a degree of polarization (DOP) of at least 25 %. Although the test source is highly polarized, the DOP at the output of the OA is reduced by amplified spontaneous emission (ASE). Annex A analyses the impact of ASE on the DOP. In order to assure an accurate measurement, the DOP is measured as part of the measurement procedure.

The method described herein has been shown to be immune to polarization-dependent gain (PDG) and polarization dependent loss (PDL) up to approximately 1 dB.

Although the Jones matrix eigenanalysis (JME) test method is in principle also applicable to unpumped (that is, unpowered) OAs, the JME technique in this standard applies to pumped (that is, powered) OAs only.

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/TR 61282-9, *Fibre optic communication system design guides – Part 9: Guidance on polarization mode dispersion measurements and theory*

IEC/TR 61292-5, *Optical amplifiers – Part 5: Polarization mode dispersion parameter – General information*