

This document is a preview generated by EVS

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-6: Examinations and measurements - Return loss

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 61300-3-6:2009 sisaldb Euroopa standardi EN 61300-3-6:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 61300-3-6:2009 consists of the English text of the European standard EN 61300-3-6:2009.
Standard on kinnitatud Eesti Standardikeskuse 29.05.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 29.05.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kätesaadavaks tegemise kuupäev on 31.03.2009.	Date of Availability of the European standard text 31.03.2009.
Standard on kätesaadav Eesti standardiorganisatsionist.	The standard is available from Estonian standardisation organisation.

ICS 33.180.20

Võtmesõnad:

Standardite reproduutseerimis- ja levitamisõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

English version

**Fibre optic interconnecting devices and passive components -
Basic test and measurement procedures -
Part 3-6: Examinations and measurements -
Return loss
(IEC 61300-3-6:2008)**

Dispositifs d'interconnexion
et composants passifs à fibres optiques -
Méthodes fondamentales d'essais
et de mesures -
Partie 3-6: Examens et mesures -
Affaiblissement de réflexion
(CEI 61300-3-6:2008)

Lichtwellenleiter -
Verbindungselemente
und passive Bauteile -
Grundlegende Prüf- und Messverfahren -
Teil 3-6: Untersuchungen und Messungen -
Rückflussdämpfung
(IEC 61300-3-6:2008)

This European Standard was approved by CENELEC on 2009-03-01. 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: avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 86B/2762/FDIS, future edition 3 of IEC 61300-3-6, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61300-3-6 on 2009-03-01.

This European Standard supersedes EN 61300-3-6:2003.

The changes with respect to EN 61300-3-6:2003 are to reconsider the constitution of this standard and launch conditions for multimode fibres.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2009-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61300-3-6:2008 was approved by CENELEC as a European Standard without any modification.

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 60793-2	Series	Optical fibres - Part 2: Product specifications	EN 60793-2	Series
IEC 61300-1	- ¹⁾	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	EN 61300-1	2003 ²⁾
IEC 61300-3-1	- ¹⁾	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-1: Examinations and measurements - Visual examination	EN 61300-3-1	2005 ²⁾
IEC 61300-3-39	- ¹⁾	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-39: Examinations and measurements - PC optical connector reference plug selection	EN 61300-3-39	1997 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references.....	7
3 General description.....	7
3.1 Method 1	8
3.2 Method 2	8
3.3 Method 3	8
3.4 Method 4	8
3.5 Selection of reference measurement method	8
4 Apparatus and symbols.....	9
4.1 Device under test (DUT)	9
4.2 Method 1: measurements with OCWR.....	9
4.2.1 Branching device (BD)	10
4.2.2 Detector (D_1 , D_2 and D_3)	10
4.2.3 Source (S_1 and S_2)	10
4.2.4 Temporary joint (TJ)	10
4.2.5 Termination (T).....	10
4.3 Method 2: measurements with OTDR	11
4.3.1 Optical time domain reflectometer (OTDR).....	11
4.3.2 Fibre sections (L_1 , L_2 , and L_3)	11
4.3.3 Temporary joints (TJ).....	11
4.4 Method 3: measurements with OLCR	11
4.4.1 Light source (S)	12
4.4.2 Branching device (BD)	12
4.4.3 Optical delay line (ODL)	12
4.4.4 Optical detector (D).....	12
4.4.5 Temporary joint (TJ)	12
4.4.6 Data processing unit	12
4.5 Method 4: measurements with an OFDR	13
4.5.1 RF network analyser	13
4.5.2 Optical heads – Source (S) and receiver (D)	13
4.5.3 Optical variable attenuator (A) (optional)	13
4.5.4 Optical amplifier (OA) (optional)	13
4.5.5 Isolator (I) (optional)	14
4.5.6 Branching device (BD)	14
4.5.7 Temporary joint (TJ)	14
4.5.8 Computer.....	14
5 Procedure.....	14
5.1 Launch conditions.....	14
5.2 Pre-conditioning	14
5.3 DUT output port.....	14
5.4 Method 1: measurement with OCWR	14
5.4.1 Definition of the OCWR measurement.....	14
5.4.2 Set-up characterization	15
5.4.3 Measurement procedure	17

5.4.4	Accuracy considerations	18
5.5	Method 2: measurement with OTDR.....	18
5.5.1	Definition of the OTDR measurement.....	18
5.5.2	Evaluation of backscattering coefficient.....	19
5.5.3	Measurement procedure	20
5.5.4	Accuracy considerations	21
5.6	Method 3: measurement with OLCR.....	21
5.6.1	Calibration procedure.....	21
5.6.2	Measurement procedure	21
5.6.3	Accuracy considerations	22
5.7	Method 4: measurements with OFDR	22
5.7.1	Calibration procedure.....	22
5.7.2	Measurement procedure	22
5.7.3	Accuracy considerations	22
6	Details to be specified.....	23
6.1	Return loss measurement with OCWR	23
6.1.1	Reference components	23
6.1.2	Branching device	23
6.1.3	Detector.....	23
6.1.4	Source.....	24
6.1.5	Temporary joint.....	24
6.1.6	Termination	24
6.2	Return loss measurement with OTDR	24
6.2.1	Reference components	24
6.2.2	OTDR	24
6.2.3	L_1 , L_2 , and L_3	24
6.2.4	Fibre.....	24
6.3	Return loss measurement with OLCR.....	24
6.3.1	Reference components	24
6.3.2	Source.....	25
6.3.3	Branching device (BD)	25
6.4	Return loss measurement with OFDR	25
6.4.1	Reference components	25
6.4.2	Vector network analyser.....	25
6.4.3	Branching device	25
6.4.4	Source.....	25
6.4.5	Detector.....	25
6.4.6	Optical amplifier (optional)	26
6.4.7	Isolator (optional).....	26
6.4.8	Calibration	26
6.5	Measurement procedure	26
Annex A (informative)	Comparison of return loss detectable by four different methods	27
Figure 1 – Measurement set-up of return loss OCWR method.....	9	
Figure 2 – Measurement set-up of return loss with OTDR method.....	11	
Figure 3 – Measurement set-up of return loss with OLCR method	12	
Figure 4 – Measurement set-up of return loss with OFDR method.....	13	
Figure 5 – Measurement set-up of the system reflected power.....	15	

Figure 6 – Measurement set-up of the branching device transfer coefficient	16
Figure 7 – Measurement set-up of the splitting ratio of the branching device	16
Figure 8 – Measurement set-up of return loss with an OCWR	17
Figure 9 – Typical OTDR trace of the response to a reflection.....	19
Figure A.1 – Comparison of detectable return loss, resolution and measurable distance for four return loss measurement methods	27
Table 1 – OTDR parameters for some pulse duration	20
Table 2 – Example of system data and relevant dynamic range.....	23

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

**Part 3-6: Examinations and measurements –
Return loss**

1 Scope

This part of IEC 61300 presents procedures for the measurement of the return loss (RL) of a fibre optic device under test (DUT).

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 60793-2 (all parts), *Optical fibres – Product specifications*

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 61300-3-39, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-39: Examinations and measurements – PC optical connector reference plug selection*