

**Fibre optic communication subsystem test procedures -
Digital systems - Part 2-8: Determination of low BER
using Q-factor measurements**

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English version

**Fibre optic communication subsystem test procedures -
Digital systems**
Part 2-8: Determination of low BER using Q-factor measurements
(IEC 61280-2-8:2003)

Procédures d'essai des sous-systèmes
de télécommunications à fibres optiques -
Systèmes numériques
Partie 2-8: Détermination du faible
Taux d'Erreur Binaire (TEB)
en utilisant les mesures du facteur Q
(CEI 61280-2-8:2003)

Prüfverfahren für Lichtwellenleiter-
Kommunikationsunterssysteme -
Digitale Systeme
Teil 2-8: Bestimmung von geringen
Bitfehlerverhältnissen (BERs)
mit Hilfe von Q-Faktormessungen
(IEC 61280-2-8:2003)

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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/485/FDIS, future edition 1 of IEC 61280-2-8, prepared by SC 86C, Fibre optic systems and active devices, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61280-2-8 on 2003-03-01.

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) 2003-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex A is normative and annex B is informative.

Endorsement notice

The text of the International Standard IEC 61280-2-8:2003 was approved by CENELEC as a European Standard without any modification.

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**INTERNATIONAL
STANDARD**

**IEC
61280-2-8**

First edition
2003-02

**Fibre optic communication subsystem test
procedures – Digital systems**

**Part 2-8:
Determination of low BER
using Q-factor measurements**



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INTERNATIONAL STANDARD

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Part 2-8: Determination of low BER using Q-factor measurements

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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –
DIGITAL SYSTEMS –**
**Part 2-8: Determination of low BER
using Q-factor measurements**

FOREWORD

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International Standard IEC 61280-2-8 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

The text of this standard is based on the following documents.

FDIS	Report on voting
86C/485/FDIS	86C/505/RVD

Full information on the voting for the approval of this standard 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.

The committee has decided that the contents of this publication will remain unchanged until 2010. At this date, the publication will be

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

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES – DIGITAL SYSTEMS –

Part 2-8: Determination of low BER using Q-factor measurements

1 Scope

This part of IEC 61280 specifies two main methods for the determination of low BER values by making accelerated measurements. These include the variable decision threshold method (Clause 4) and the variable optical threshold method (Clause 5). In addition, a third method, the sinusoidal interference method, is described in Annex B.

2 Definitions and abbreviated terms

2.1 Definitions

For the purposes of this document, the following terms and definitions apply.

2.1.1

amplified spontaneous emission

ASE

impairment generated in optical amplifiers

2.1.2

bit error ratio

BER

the number bits in error as a ratio of the total number of bits

2.1.3

intersymbol interference

ISI

mutual interference between symbols in a data stream, usually caused by non-linear effects and bandwidth limitations of the transmission path

2.1.4

Q-factor

Q

ratio of the difference between the mean voltage of the 1 and 0 rails, and the sum of their standard deviation values

2.2 Abbreviations

cw Continuous wave (normally referring to a sinusoidal wave form)

DC Direct current

DSO Digital sampling oscilloscope

DUT Device under test

PRBS Pseudo-random binary sequence