



BSI Standards Publication

Fibre optic communication subsystem test procedures

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

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National foreword

This British Standard is the UK implementation of EN IEC 61280-2-8:2021. It is identical to IEC 61280-2-8:2021. It supersedes BS EN 61280-2-8:2003, which will be withdrawn on 5 November 2021.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/3, Fibre optic systems and active devices.

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

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Date	Text affected
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EUROPÄISCHE NORM

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Supersedes EN 61280-2-8:2003 and all of its
amendments and corrigenda (if any)

English Version

Fibre optic communication subsystem test procedures - Part 2-8:
Digital systems - Determination of low BER using Q-factor
measurements
(IEC 61280-2-8:2021)

Procédures d'essai des sous-systèmes de
télécommunications fibroniques - Partie 2-8: Systèmes
numériques - Détermination de faibles valeurs de BER en
utilisant des mesures du facteur Q
(IEC 61280-2-8:2021)

Prüfverfahren für Lichtwellenleiter-
Kommunikationsuntersysteme - Teil 2-8: Digitale Systeme -
Bestimmung von geringen Bitfehlerraten (BER) mit Hilfe
von Q-Faktor Messungen
(IEC 61280-2-8:2021)

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

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European foreword

The text of document 86C/1708/FDIS, future edition 2 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 approved by CENELEC as EN IEC 61280-2-8:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-01-06 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-04-06 document have to be withdrawn

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61280-2-8:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61281-1 NOTE Harmonized as EN IEC 61281-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

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

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

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) correction of errors in Formula (8) in 5.5.2 and in a related formula in 5.5.3;
- b) correction of errors in the references to clauses, subclauses, figures, procedures, and in the Bibliography;
- c) alignment of the terms and definitions in 3.1 with those in IEC 61281-1.

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The text of this International Standard is based on the following documents:

FDIS	Report on voting
86C/1708/FDIS	86C/1711/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

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FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 2-8: Digital systems – 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 5) and the variable optical threshold method (Clause 6). In addition, a third method, the sinusoidal interference method, is described in Annex B.

2 Normative references

There are no normative references in this document.

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

amplified spontaneous emission

ASE

optical power associated to spontaneously emitted photon amplified by an active medium in an optical amplifier

3.1.2

bit error ratio

BER

P_e

number of errored bits divided by the total number of bits, over some stipulated period of time

3.1.3

intersymbol interference

ISI

overlap of adjacent pulses as caused by the limited bandwidth characteristics of the optical devices in a fibre optic link

3.1.4

Q-factor

Q

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