

STN	Piezoelektrické, dielektrické a elektrostatické oscilátory stanovenej kvality Časť 1: Všeobecná špecifikácia	STN EN 60679-1 35 8430
------------	---	--

Piezoelectric, dielectric and electrostatic oscillators of assessed quality - Part 1: Generic specification

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 07/18

Obsahuje: EN 60679-1:2017, IEC 60679-1:2017

Oznámením tejto normy sa od 30.08.2020 ruší
STN EN 60679-1 (35 8430) z februára 2008

127013

EUROPEAN STANDARD

EN 60679-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2017

ICS 31.140

Supersedes EN 60679-1:2007

English Version

Piezoelectric, dielectric and electrostatic oscillators of assessed
quality - Part 1: Generic specification
(IEC 60679-1:2017)

Oscillateurs piézoélectriques, diélectriques et
électrostatiques sous assurance de la qualité - Partie 1:
Spécification générique
(IEC 60679-1:2017)

Piezoelektrische, dielektrische und elektrostatische
Oszillatoren mit bewerteter Qualität - Teil 1:
Fachgrundspezifikation
(IEC 60679-1:2017)

This European Standard was approved by CENELEC on 2017-08-30. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 60679-1:2017**European foreword**

The text of document 49/1229/FDIS, future edition 4 of IEC 60679-1, prepared by IEC/TC 49 "Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60679-1:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-05-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-08-30

This document supersedes EN 60679-1:2007.

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 60679-1:2017 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 60068-2-6	NOTE	Harmonized as EN 60068-2-6.
IEC 60068-2-17	NOTE	Harmonized as EN 60068-2-17.
IEC 60068-2-27	NOTE	Harmonized as EN 60068-2-27.
IEC 60068-2-64	NOTE	Harmonized as EN 60068-2-64.
IEC 60122-1:2002	NOTE	Harmonized as EN 60122-1:2002 (not modified).
IEC 60679-3:2012	NOTE	Harmonized as EN 60679-3:2013 (not modified).
IEC 60679-4	NOTE	Harmonized as EN 60679-4.
IEC 60679-5	NOTE	Harmonized as EN 60679-5.
IEC 61019-1:2004	NOTE	Harmonized as EN 61019-1:2005 (not modified).
IEC 61019-2:2005	NOTE	Harmonized as EN 61019-2:2005 (not modified).
IEC 61837-1:2012	NOTE	Harmonized as EN 61837-1:2012 (not modified).
IEC 61837-2:2011	NOTE	Harmonized as EN 61837-2:2011 (not modified).
IEC 61837-3:2015	NOTE	Harmonized as EN 61837-3:2015 (not modified).
IEC 61837-4:2015	NOTE	Harmonized as EN 61837-4:2015 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC TR 61000-4-1	-	Electromagnetic compatibility (EMC) - Part 4-1: Testing and measurement techniques - Overview of the IEC 61000-4 series	-	-
IEC 60027	series	Letter symbols to be used in electrical technology	EN 60027	series
IEC 60050-561	-	International electrotechnical vocabulary - Part 561: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection	-	-
IEC 60469	-	Transitions, pulses and related waveforms - Terms, definitions and algorithms	EN 60469	-
IEC 60617	-	Standard data element types with associated classification scheme for electric components - Part 4: IEC reference collection for standard data element types and component classes	-	-
IEC 60748-2	-	Semiconductor devices - Integrated circuits - Part 2: Digital integrated circuits	-	-
IEC 60749-26	-	Semiconductor devices - Mechanical and climatic test methods - Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)	EN 60749-26	-
IEC 60749-27	-	Semiconductor devices - Mechanical and climatic test methods - Part 27: Electrostatic discharge (ESD) sensitivity testing - Machine model (MM)	EN 60749-27	-
IEC 61340-5-1	-	Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements	EN 61340-5-1	-
IEC 62884-1	2017	Measurement techniques of piezoelectric, dielectric and electrostatic oscillators - Part 1: Basic methods for the measurement	EN 62884-1	2017
ISO 80000-1	-	Quantities and units - Part 1: General	EN ISO 80000-1	-



IEC 60679-1

Edition 4.0 2017-07

INTERNATIONAL STANDARD

**Piezoelectric, dielectric and electrostatic oscillators of assessed quality –
Part 1: Generic specification**



**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2017 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.



IEC 60679-1

Edition 4.0 2017-07

INTERNATIONAL STANDARD

**Piezoelectric, dielectric and electrostatic oscillators of assessed quality –
Part 1: Generic specification**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.140

ISBN 978-2-8322-4608-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and general information	7
3.1 General.....	7
3.2 Terms and definitions.....	7
3.3 Preferred values for ratings and characteristics	21
3.3.1 General	21
3.3.2 Climatic category (40/85/56).....	22
3.3.3 Bump severity.....	22
3.3.4 Vibration severity.....	22
3.3.5 Shock severity.....	22
3.3.6 Leak rate	22
3.4 Marking.....	23
3.4.1 General	23
3.4.2 Packaging.....	23
4 Quality assessment procedures	23
4.1 General.....	23
4.2 Primary stage of manufacture	23
4.3 Structurally similar components	23
4.4 Subcontracting.....	23
4.5 Incorporated components.....	24
4.6 Manufacturer's approval.....	24
4.7 Approval procedures	24
4.7.1 General	24
4.7.2 Capability approval	24
4.7.3 Qualification approval	24
4.8 Procedures for capability approval	25
4.8.1 General	25
4.8.2 Eligibility for capability approval.....	25
4.8.3 Application for capability approval	25
4.8.4 Granting of capability approval	25
4.8.5 Capability manual	25
4.9 Procedures for qualification approval	25
4.9.1 General	25
4.9.2 Eligibility for qualification approval.....	25
4.9.3 Application for qualification approval	25
4.9.4 Granting of qualification approval	25
4.9.5 Quality conformance inspection	26
4.10 Test procedures	26
4.11 Screening requirements	26
4.12 Rework and repair work	26
4.12.1 Rework	26
4.12.2 Repair work	26
4.13 Certified test records.....	26
4.14 Validity of release	26
4.15 Release for delivery	26

4.16	Unchecked parameters	27
Annex A (normative)	Load circuit for logic drive	28
A.1	TTL and Schottky	28
A.2	CMOS	30
A.3	ECL	30
A.4	LVDS	31
Annex B (normative)	Latch-up test	32
B.1	Definition	32
B.1.1	Latch-up	32
B.1.2	Test procedure	32
B.2	Test method	32
Annex C (normative)	Electrostatic discharge sensitivity classification	33
C.1	Definition	33
C.1.1	Electrostatic discharge (ESD)	33
C.1.2	Test procedure	33
C.2	Test methods	33
C.2.1	General	33
C.2.2	Leaded oscillator	33
C.2.3	SMD oscillator	33
C.2.4	The impact of ESD on Oscillator in steady-state	33
Annex D (normative)	Digital interfaced crystal oscillator's function	34
Bibliography	35
Figure 1	– Basic configurations of SAW resonators	9
Figure 2	– Example of the use of frequency offset	11
Figure 3	– Linearity of frequency modulation deviation	16
Figure 4	– Characteristics of an output waveform	18
Figure 5	– Definition of start-up time	19
Figure 6	– Clock signal with period jitter	19
Figure 7	– Phase jitter measures	20
Figure 8	– Gaussian distribution of jitter	20
Figure 9	– Jitter amplitude and period of jitter frequency	20
Figure 10	– Jitter tolerance according to ITU-T G.825, ATIS-0900101, Telcordia GR-253 and ETSI EN 300 462	21
Figure A.1	– Circuit for TTL	28
Figure A.2	– Circuit for Schottky logic	29
Figure A.3	– Circuit for PECL	30
Figure A.4	– Circuit for LVDS	31
Table A.1	– Values to be used when calculating R_1 and R_2	30
Table A.2	– Operating condition	31
Table A.3	– DC Electrical characteristics output load = 50 Ω to V_{cc} -2V	31
Table D.1	– Function of the digital interface	34

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PIEZOELECTRIC, DIELECTRIC AND ELECTROSTATIC OSCILLATORS OF ASSESSED QUALITY –

Part 1: Generic specification

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60679-1 has been prepared by IEC technical committee TC 49: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection.

This fourth edition cancels and replaces the third edition published in 2007. This edition constitutes a technical revision.

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

- a) the title has been changed;
- b) additional matters related to oscillator using SAW or MEMS resonator in "Terms, definitions and general information" have been included;
- c) measurement methods of IEC 60679-1:2007 have been removed (they will be moved to IEC 62884 series);

- d) the content of Annex A has been extended;
- e) a new term and definition DIXO (Digital interfaced Crystal Oscillator) has been added;
- f) a new term and definition SSXO (Spread Spectrum Crystal Oscillator) has been added;
- g) Annex D has been added.

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

FDIS	Report on voting
49/1229/FDIS	49/1233/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60679 series, published under the general title *piezoelectric, dielectric and electrostatic oscillators of assessed quality* can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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.

A bilingual version of this publication may be issued at a later date.

PIEZOELECTRIC, DIELECTRIC AND ELECTROSTATIC OSCILLATORS OF ASSESSED QUALITY –

Part 1: Generic specification

1 Scope

This part of IEC 60679 specifies general requirements for piezoelectric, dielectric and electrostatic oscillators, including Dielectric Resonator Oscillators (DRO) and oscillators using FBAR (hereinafter referred to as "Oscillator"), of assessed quality using either capability approval or qualification approval procedures.

NOTE Dielectric Resonator Oscillators (DRO) and oscillators using FBAR are under consideration.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050-561, *International electrotechnical vocabulary – Part 561: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection*. Available at www.electropedia.org

IEC 60469, *Transitions, pulses and related waveforms – Terms, definitions and algorithms*

IEC 60617, *Graphical symbols for diagrams*. Available at <http://std.iec.ch/iec60617>

IEC 60748-2, *Semiconductor devices – Integrated circuits – Part 2: Digital integrated circuits*

IEC 60749-26, *Semiconductor devices – Mechanical and climatic test methods – Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)*

IEC 60749-27, *Semiconductor devices – Mechanical and climatic test methods – Part 27: Electrostatic discharge (ESD) sensitivity testing – Machine model (MM)*

IEC TR 61000-4-1, *Electromagnetic compatibility (EMC) – Part 4-1: Testing and measurement techniques – Overview of the IEC 61000-4 series*

IEC 61340-5-1, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC 62884-1:2017, *Measurement techniques of piezoelectric, dielectric, and electrostatic oscillators – Part 1: Basic methods for the measurement*

ISO 80000-1, *Quantities and units – Part 1: General*

Where any discrepancies occur for any reason, documents shall rank in the following order of precedence:

- detail specification;
- sectional specification;
- generic specification;
- any other international documents (for example of the IEC) to which reference is made.

The same order of precedence shall apply to equivalent national documents.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN