

Irish Standard I.S. EN 62276:2016

Single crystal wafers for surface acoustic wave (SAW) device applications -Specifications and measuring methods

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I.S. EN 62276:2016

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National Foreword

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EN 62276

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2016

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Supersedes EN 62276:2013

English Version

Single crystal wafers for surface acoustic wave (SAW) device applications - Specifications and measuring methods (IEC 62276:2016)

Tranches monocristallines pour applications utilisant des dispositifs à ondes acoustiques de surface (OAS) - Spécifications et méthodes de mesure (IEC 62276:2016) Einkristall-Wafer für Oberflächenwellen-(OFW-)Bauelemente - Festlegungen und Messverfahren (IEC 62276:2016)

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

EN 62276:2016

European foreword

The text of document 49/1144/CDV, future edition 3 of IEC 62276, 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 62276:2016.

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)	2017-08-28
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-11-28

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IEC 61019-1	NOTE	Harmonized as EN 61019-1.
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IEC 61019-3	NOTE	Harmonized as EN 61019-3.
ISO 4287:1997	NOTE	Harmonized as EN ISO 4287:1998.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. NOTE 1 When 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.

Publication	Year	Title	EN/HD	Year
IEC 60758	2016	Synthetic Quartz Crystal - Specifications and guidelines for use	EN 60758	2016
ISO 2859-1	1989	Sampling procedures for inspection by attributes; part_1: sampling plans indexed by acceptable quality level (AQL) for lot-by lot inspection	-	-

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Edition 3.0 2016-10

INTERNATIONAL STANDARD

Single crystal wafers for surface acoustic wave (SAW) device applications – Specifications and measuring methods





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INTERNATIONAL STANDARD

Single crystal wafers for surface acoustic wave (SAW) device applications – Specifications and measuring methods

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SINGLE CRYSTAL WAFERS FOR SURFACE ACOUSTIC WAVE (SAW) DEVICE APPLICATIONS – SPECIFICATIONS AND MEASURING METHODS

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International Standard IEC 62276 has been prepared by IEC technical committee 49: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection.

This third edition cancels and replaces the second edition of IEC 62276 published in 2012. It constitutes a technical revision.

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

- Corrections of Euler angle indications in Table 1 and axis directions in Figure 3.
- Definition of "twin" is not explained clearly enough in 3.3.3. Therefore it is revised by a more detailed definition.
- Etch channels maximum number at quartz wafer of seed which do not pass through from surface to back surface are classified for three grades in 4.2.13 a). Users use seed portions of quartz wafers for devices. They request quartz wafers with less etch channels

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in seeds to reduce defects of devices. The classification of etch channels in seed may prompt a rise in quartz wafer quality.

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

CDV	Report on voting
49/1144/CDV	49/1170/RVC

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 the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- replaced by a revised edition, or
- amended.

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

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INTRODUCTION

A variety of piezoelectric materials are used for surface acoustic wave (SAW) filter and resonator applications. Prior to an IEC meeting in 1996 in Rotterdam, wafer specifications were typically negotiated between users and suppliers. During this meeting, a proposal was announced to address wafer standardization. This standard has been prepared in order to provide industry standard technical specifications for manufacturing piezoelectric single crystal wafers to be used in surface acoustic wave devices.

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SINGLE CRYSTAL WAFERS FOR SURFACE ACOUSTIC WAVE (SAW) DEVICE APPLICATIONS – SPECIFICATIONS AND MEASURING METHODS

1 Scope

This document applies to the manufacture of synthetic quartz, lithium niobate (LN), lithium tantalate (LT), lithium tetraborate (LBO), and lanthanum gallium silicate (LGS) single crystal wafers intended for use as substrates in the manufacture of surface acoustic wave (SAW) filters and resonators.

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 60758:2016, Synthetic quartz crystal – Specifications and guidelines for use

ISO 2859-1: 1999, Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

3 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 Single crystals for SAW wafer

3.1.1

as-grown synthetic quartz crystal

right-handed or left-handed single crystal quartz grown hydrothermally

Note 1 to entry: The term "as-grown" indicates a state prior to mechanical fabrication.

Note 2 to entry: See IEC 60758 for further information concerning crystalline quartz.

3.1.2 lithium niobate LN

single crystals approximately described by chemical formula LiNbO₃, grown by Czochralski (crystal pulling from melt) or other growing methods

3.1.3 lithium tantalate LT

single crystals approximately described by chemical formula LiTaO₃, grown by Czochralski (crystal pulling from melt) or other growing methods



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