

# TECHNICAL SPECIFICATION

**Piezoelectric and dielectric devices for frequency control and selection –  
Glossary –  
Part 4-1: Piezoelectric materials – Synthetic quartz crystal**

IEC TS 61994-4-1:2007

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## TECHNICAL SPECIFICATION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PIEZOELECTRIC AND DIELECTRIC DEVICES  
FOR FREQUENCY CONTROL AND SELECTION –  
GLOSSARY –**

**Part 4-1: Piezoelectric materials –  
Synthetic quartz crystal**

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IEC 61994-4-1, which is a technical specification, has been prepared by IEC technical committee 49: Piezoelectric and dielectric devices for frequency control and selection.

This second edition of IEC 61994-4-1 cancels and replaces the first edition published in 2001. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- this second edition takes into account new terms and definitions given in IEC 60758, third edition, published in 2004.

The text of this technical specification is based on the following documents:

|               |                  |
|---------------|------------------|
| Enquiry draft | Report on voting |
| 49/763/DTS    | 49/767/RVC       |

Full information on the voting for the approval of this technical specification 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.

IEC 61994 consists of the following parts under the general title, *Piezoelectric and dielectric devices for frequency control and selection – Glossary*:

- Part 1: Piezoelectric and dielectric resonators
- Part 2: Piezoelectric and dielectric filters
- Part 3: Piezoelectric oscillators
- Part 4-1: Piezoelectric materials– Synthetic quartz crystal
- Part 4-2: Piezoelectric and dielectric materials – Piezoelectric ceramics
- Part 4-3: Materials for dielectric devices<sup>1</sup>
- Part 4-4: Materials – Materials for Surface Acoustic Wave (SAW) devices

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

- transformed into an international standard;
- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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

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<sup>1</sup> To be published.

# PIEZOELECTRIC AND DIELECTRIC DEVICES FOR FREQUENCY CONTROL AND SELECTION – GLOSSARY –

## Part 4-1: Piezoelectric materials – Synthetic quartz crystal

### 1 Scope

This technical specification gives the terms and definitions for synthetic quartz single crystals representing the present state-of-the-art, which are intended for manufacturing piezoelectric elements for frequency control and selection.

### 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 60050(561):1991, *International Electrotechnical Vocabulary (IEV) – Chapter 561: Piezoelectric devices for frequency control and selection*

IEC 60758:2004, *Synthetic quartz crystal – Specifications and guide to the use*

### 3 Terms and definitions

#### 3.1

##### **AT-cut plate**

rotated Y-cut crystal plate oriented at an angle of about  $+35^\circ$  around the X-axis or of about  $-3^\circ$  from the z (minor rhombohedral) -face

[IEC 60758, 3.7.2]

#### 3.2

##### **as-grown Y-bar**

crystals which are produced using seeds with the largest dimension in the Y-direction

[IEC 60758, 3.2.2]

#### 3.3

##### **as-grown Z-bar**

as-grown Y-bar crystals in which the Z-grown sector is much larger than the X-growth sector.

The relative size of the growth sector is controlled by the X-dimension of the seed

[IEC 60758, 3.2.3 modified]

#### 3.4

##### **as-grown synthetic quartz crystal**

single crystal quartz grown hydrothermally. "As-grown" refers to the state of processing and indicates a state prior to mechanical fabrication

[IEC 60758, 3.2.1 modified]

#### 3.5

##### **autoclave**

vessel for the high-pressure, high-temperature condition required for growth of synthetic quartz crystal

[IEC 60758, 3.15]