

Surface acoustic wave (SAW) and bulk acoustic wave (BAW) duplexers of assessed quality - Part 2:  
Guidelines for the use

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

|                                                                                                                     |                                                                                                                                                      |
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English Version

Surface acoustic wave (SAW) and bulk acoustic wave (BAW)  
duplexers of assessed quality - Part 2: Guidelines for the use  
(IEC 62604-2:2022)

Duplexeurs à ondes acoustiques de surface (OAS) et à  
ondes acoustiques de volume (OAV) sous assurance de la  
qualité - Partie 2: Lignes directrices d'utilisation  
(IEC 62604-2:2022)

Oberflächenwellen-(OFW-) und Volumenwellen-(BAW-  
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## European foreword

The text of document 49/1361/CDV, future edition 3 of IEC 62604-2, 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 IEC 62604-2:2022.

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) 2023-07-06
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-10-06

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| IEC 62047-7:2011 | NOTE | Harmonized as EN 62047-7:2011 (not modified) |
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| IEC 62604-1      | NOTE | Harmonized as EN IEC 62604-1                 |

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Surface acoustic wave (SAW) and bulk acoustic wave (BAW) duplexers of assessed quality –**

**Part 2: Guidelines for the use**

**Duplexeurs à ondes acoustiques de surface (OAS) et à ondes acoustiques de volume (OAV) sous assurance de la qualité –**

**Partie 2: Lignes directrices d'utilisation**



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# INTERNATIONAL STANDARD

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Part 2: Guidelines for the use**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SURFACE ACOUSTIC WAVE (SAW) AND BULK  
ACOUSTIC WAVE (BAW) DUPLEXERS  
OF ASSESSED QUALITY –****Part 2: Guidelines for the use****FOREWORD**

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This third edition cancels and replaces the second edition published in 2017. This edition constitutes a technical revision.

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

- a) the term "cross-isolation" has been added to Clause 3;
- b) multiplexers are described.

**NOTE** In this document, SAW and BAW duplexers are treated simultaneously because both duplexers are used in the same manner, especially in mobile phone systems and have the same requirements of characteristics, test method and so on.

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

| Draft       | Report on voting |
|-------------|------------------|
| 49/1361/CDV | 49/1376/RVC      |

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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## INTRODUCTION

While in 2G systems mainly dielectric duplexers have been used, the ongoing miniaturization in 3G and 4G mobile communication systems promoted the development and application of acoustic wave duplexers due to their small size, light weight and good electrical performance. While standard surface acoustic wave (SAW) duplexers have been employed for applications with moderate requirements regarding the steepness of individual filters, applications with narrow duplex gap (e.g. Bands 2, 3, 8, 25), i.e., the frequency gap between receiving and transmitting bands, require the application of temperature-compensated (TC) SAW or bulk acoustic wave (BAW) technology, because of their better temperature characteristics and resonator Q-factors.

Standard specifications, such as those of IEC, of which these guidelines form a part, and national specifications or detail specifications issued by manufacturers will define the available combinations of centre frequency, pass bandwidth and insertion attenuation for each sort of transmitting and receiving filters and the isolation level between transmitter and receiver ports, etc. These specifications are compiled to include a wide range of SAW and BAW duplexers with standardized performances. It cannot be over-emphasized that the user should, wherever possible, select his duplexers from these specifications, when available, even if it can lead to making small modifications to his circuit to enable the use of standard duplexers. This applies particularly to the selection of the nominal frequency band.

# **SURFACE ACOUSTIC WAVE (SAW) AND BULK ACOUSTIC WAVE (BAW) DUPLEXERS OF ASSESSED QUALITY –**

## **Part 2: Guidelines for the use**

### **1 Scope**

This part of IEC 62604 applies to duplexers which can separate receiving signals from transmitting signals and are key components for two-way radio communications, and which are generally used in mobile phone systems compliant with CDMA systems such as N-CDMA in second generation mobile telecommunication systems (2G), W-CDMA / UMTS (3G) or LTE (4G).

These guidelines draw attention to some fundamental questions about the theory of SAW and BAW duplexers and how to use them, which will be considered by the user before he places an order for SAW and BAW duplexers for a new application. Such a procedure will be the user's insurance against unsatisfactory performance. Because SAW and BAW duplexers have very similar performance for the usage, it is useful and convenient for users that both duplexers are described in one standard.

### **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 60862-1, *Surface acoustic wave (SAW) filters of assessed quality – Part 1: Generic specification*

IEC 62575-1, *Radio frequency (RF) bulk acoustic wave (BAW) filters of assessed quality – Part 1: Generic specification*

### **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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### **3.1 Response characteristics related terms**

##### **3.1.1**

##### **guard band**

unused part of the radio spectrum between radio bands, for the purpose of preventing interference