



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN IEC 62604-1:2022

Surface acoustic wave (SAW) and bulk acoustic wave (BAW) duplexers of assessed quality - Part 1: Generic specification

Oberflächenwellen-(OFW-) und
Volumenwellen-(BAW-)Duplexer mit
bewerteter Qualität – Teil 1:
Fachgrundspezifikation

Duplexeurs à ondes acoustiques de
surface (OAS) et à ondes acoustiques de
volume (OAV) sous assurance de la
qualité - Partie 1: Spécification générique

09/2022



National Foreword

This European Standard EN IEC 62604-1:2022 was adopted as Luxembourgish Standard ILNAS-EN IEC 62604-1:2022.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN IEC 62604-1:2022

EUROPEAN STANDARD **EN IEC 62604-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2022

ICS 31.140

Supersedes EN 62604-1:2015

English Version

**Surface acoustic wave (SAW) and bulk acoustic wave (BAW)
duplexers of assessed quality - Part 1: Generic specification
(IEC 62604-1:2022)**

Duplexeurs à ondes acoustiques de surface (OAS) et à
ondes acoustiques de volume (OAV) sous assurance de la
qualité - Partie 1: Spécification générique
(IEC 62604-1:2022)

Oberflächenwellen-(OFW-) und Volumenwellen-(BAW-
)Duplexer mit bewerteter Qualität - Teil 1:
Fachgrundspezifikation
(IEC 62604-1:2022)

This European Standard was approved by CENELEC on 2022-08-15. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 49/1360/CDV, future edition 2 of IEC 62604-1, 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 IEC 62604-1:2022.

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) 2023-05-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-08-15

This document supersedes EN 62604-1:2015 and all of its amendments and corrigenda (if any).

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.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62604-1:2022 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 62047-7:2011	NOTE Harmonized as EN 62047-7:2011 (not modified)
IEC 60068-2-10:2005	NOTE Harmonized as EN 60068-2-10:2005 (not modified)
IEC 62604-2:2017	NOTE Harmonized as EN IEC 62604-2:2018 (not modified)
IEC 60862-1:2015	NOTE Harmonized as EN 60862-1:2015 (not modified)
IEC 61019-1:2004	NOTE Harmonized as EN 61019-1:2005 (not modified)
IEC 60862-2:2012	NOTE Harmonized as EN 60862-2:2012 (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 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 60068-1	2013	Environmental testing - Part 1: General and guidance	EN 60068-1	2014
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-7	-	Basic environmental testing procedures - Part 2-7: Tests - Test Ga and guidance: Acceleration, steady state	EN 60068-2-7	-
IEC 60068-2-13	-	Environmental testing - Part 2-13: Tests - Test M: Low air pressure	EN IEC 60068-2-13	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	-
IEC 60068-2-17	1994	Basic environmental testing procedures - Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	1994
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	-

IEC 60068-2-31	-	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens	EN 60068-2-31	-
IEC 60068-2-45	-	Basic environmental testing procedures - Part 2-45: Tests - Test XA and guidance: Immersion in cleaning solvents	EN 60068-2-45	-
IEC 60068-2-52	-	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN IEC 60068-2-52	-
IEC 60068-2-58	-	Environmental testing - Part 2-58: Tests - Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	EN 60068-2-58	-
IEC 60068-2-64	-	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60122-1	-	Quartz crystal units of assessed quality - Part 1: Generic specification	EN 60122-1	-
IEC 60617	-	Graphical symbols for diagrams	-	-
IEC 60642	-	Piezoelectric ceramic resonators and resonator units for frequency control and selection - Chapter I: Standard values and conditions - Chapter II: Measuring and test conditions	-	-
IEC 60695-11-5	-	Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	-
IEC 60749-28	-	Semiconductor devices - Mechanical and climatic test methods - Part 28: Electrostatic discharge (ESD) sensitivity testing - Charged device model (CDM) - device level	EN IEC 60749-28	-
IEC 61000-4-2	-	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	-
IEC 61340-3-1	-	Electrostatics - Part 3-1: Methods for simulation of electrostatic effects - Human body model (HBM) electrostatic discharge test waveforms	EN 61340-3-1	-
IEC 61340-3-2	-	Electrostatics - Part 3-2: Methods for simulation of electrostatic effects - Machine model (MM) electrostatic discharge test waveforms	EN 61340-3-2	-
IEC 62761	-	Guidelines for the measurement method of nonlinearity for surface acoustic wave (SAW) and bulk acoustic wave (BAW) devices in radio frequency (RF)	EN 62761	-

IEC 80000	series	Quantities and units	EN 80000	series
ISO 80000	series	Quantities and units	EN ISO 80000	series



INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

Part 1: Generic specification

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

Partie 1: Spécification générique

CONTENTS

FOREWORD	5
1 Scope	7
2 Normative references	7
3 Terms, definitions, units and graphical symbols	8
3.1 Terms and definitions	8
3.1.1 General terms	9
3.1.2 Response characteristics related terms	11
3.1.3 SAW and BAW duplexers related terms	15
3.2 Units and graphical symbols	16
4 Order of precedence of documents	16
5 Preferred values for ratings and characteristics	17
5.1 General	17
5.2 Nominal frequency bands	17
5.3 Operating temperature ranges, in degrees Celsius (°C)	17
5.4 Climatic category	17
5.5 Bump severity	17
5.6 Vibration severity	18
5.7 Shock severity	18
5.8 Fine leak rate	18
6 Marking	19
6.1 Duplexer marking	19
6.2 Package marking	19
7 Quality assessment procedures	19
7.1 General	19
7.2 Primary stage of manufacture	19
7.3 Structurally similar components	19
7.4 Subcontracting	19
7.5 Incorporated components	20
7.6 Manufacturer's approval	20
7.7 Approval procedures	20
7.7.1 General	20
7.7.2 Capability approval	20
7.7.3 Qualification approval	20
7.8 Procedures for capability approval	20
7.8.1 General	20
7.8.2 Eligibility for capability approval	21
7.8.3 Application for capability approval	21
7.8.4 Granting of capability approval	21
7.8.5 Capability manual	21
7.9 Procedures for qualification approval	21
7.9.1 General	21
7.9.2 Eligibility for qualification approval	21
7.9.3 Application for qualification approval	21
7.9.4 Granting of qualification approval	21
7.9.5 Quality conformance inspection	21
7.10 Test procedures	21

7.11	Screening requirements	21
7.12	Rework and repair work	22
7.12.1	Rework	22
7.12.2	Repair work	22
7.13	Certified records of released lots	22
7.14	Validity of release	22
7.15	Release for delivery	22
7.16	Unchecked parameters	22
8	Test and measurement procedures	22
8.1	General	22
8.2	Test and measurement conditions	22
8.2.1	Standard conditions for testing	22
8.2.2	Precision of measurement	23
8.2.3	Precautions	23
8.2.4	Alternative test methods	23
8.3	Visual inspection	23
8.3.1	General	23
8.3.2	Visual test A	23
8.3.3	Visual test B	24
8.4	Dimensions test	24
8.5	Electrical test procedures	24
8.5.1	S-parameters measurement	24
8.5.2	Intermodulation distortion measurement	26
8.5.3	Insulation resistance	26
8.5.4	Voltage proof	26
8.6	Mechanical and environmental test procedures	26
8.6.1	Sealing tests (non-destructive)	26
8.6.2	Soldering (solderability and resistance to soldering heat) (destructive)	27
8.6.3	Rapid change of temperature: severe shock by liquid immersion (non-destructive)	27
8.6.4	Rapid change of temperature with prescribed time of transition (non-destructive)	27
8.6.5	Bump (destructive)	27
8.6.6	Vibration (destructive)	28
8.6.7	Shock (destructive)	28
8.6.8	Free fall (destructive)	28
8.6.9	Acceleration, steady state (non-destructive)	29
8.6.10	Low air pressure (non-destructive)	29
8.6.11	Dry heat (non-destructive)	29
8.6.12	Damp heat, cyclic (destructive)	29
8.6.13	Cold (non-destructive)	29
8.6.14	Climatic sequence (destructive)	29
8.6.15	Damp heat, steady state (destructive)	30
8.6.16	Salt mist cyclic (destructive)	30
8.6.17	Immersion in cleaning solvents (non-destructive)	30
8.6.18	Flammability test (destructive)	30
8.6.19	Electrostatic discharge (ESD) sensitivity test (destructive)	30
8.7	Endurance test procedure	31
	Bibliography	32

Figure 1 – FBAR configuration	10
Figure 2 – SMR configuration.....	11
Figure 3 – Frequency response of SAW and BAW duplexers	16
Figure 4 – S -parameters measurement.....	25
Table 1 – Frequency allocation of typical UMTS bands	17