

**Harmonized system of quality
assessment for electronic
components —**

Generic specification: Piezoelectric filters

The European Standard EN 167000:1993 with the incorporation of its amendment A1:1997 has the status of a British Standard

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Cooperating organizations

The European Committee for Electrotechnical Standardization (CENELEC), under whose supervision this European Standard was prepared, comprises the national committees of the following countries:

Austria	Italy
Belgium	Luxembourg
Denmark	Netherlands
Finland	Norway
France	Portugal
Germany	Spain
Greece	Sweden
Iceland	Switzerland
Ireland	United Kingdom

This British Standard, having been prepared under the direction of the Electronic Components Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 August 1993

© BSI 04-1999

The following BSI references relate to the work on this standard:
Committee reference ECL/11
Draft for comment 91/26962 DC

ISBN 0 580 22218 7

Amendments issued since publication

Amd. No.	Date	Comments
9908	March 1998	Indicated by a sideline in the margin

Contents

	Page
Cooperating organizations	Inside front cover
National foreword	ii
Foreword	2
Text of EN 167000	5
National annex NA (informative) Committees responsible	24
National annex NB (informative) Cross-references	Inside back cover

National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Policy Committee. It is identical with EN 167000:1993 *Generic specification: Piezoelectric filters* and its amendment A.1, published by the Electronic Components Committee (CECC) of the European Committee for Electrotechnical Standardization (CENELEC).

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Descriptors: Quality, electronic components, piezoelectric filters

English version

Generic specification: Piezoelectric filters

(includes amendment A1:1997)

Spécification générique:
Filtres piézoélectriques
(inclut l'amendement A1:1997)

Fachgrundspezifikation:
Piezoelektrische Filter
(enthält Änderung A1:1997)

This European Standard was approved by the CENELEC Electronic Components Committee(CECC) on 1992-05-16. 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 General Secretariat of the CECC 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 CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

CENELEC Electronic Components Committee
Comité des Composants Electroniques du CENELEC
CENELEC-Komitee für Bauelemente der Elektronik

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized system for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby acceptable in all member countries without further testing.

This European Standard was prepared by CECC WG 17, Piezoelectric devices for frequency control and selection.

It is based, wherever possible, on the publications of the International Electrotechnical Commission (IEC).

The text of the draft based on document CECC (Secretariat) 2896 was submitted to the formal vote; together with the voting report, circulated as document CECC (Secretariat) 3106 it was approved by CECC as EN 167000 on 16 May 1992.

The following dates were fixed:

- latest date of announcement of the EN at national level (dop) 1993-06-17
- latest date of publication of an identical national standard (dop) 1993-12-17
- latest date of declaration of national standards' obsolescence 1993-12-17
- latest date of withdrawal of conflicting national standards (dow) 2003-06-17

Foreword to amendment A.1

This amendment was prepared by CLC/TC CECC/SC 49.

The text of the draft was submitted to the formal vote and was approved by CENELEC as amendment A1 to EN 167000:1993 on 1997-03-11.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-03-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1998-03-01

Contents

	Page	Page
Foreword	2	4.5.8 Return attenuation
Section 1. Scope	5	4.5.9 Return attenuation as a function of temperature
Section 2. General	5	4.5.10 Intermodulation distortion
2.1 Order of precedence	5	4.6 Mechanical and environmental test procedures
2.2 Related documents	5	4.6.1 Robustness of terminations
2.3 Units, symbols and terminology	6	4.6.2 Sealing tests
2.4 Preferred ratings and characteristics	9	4.6.3 Soldering (Solderability and resistance to solder heat)
2.5 Marking	10	4.6.4 Rapid change of temperature : severe shock by liquid immersion
Section 3. Quality assessment procedures		4.6.5 Rapid change of temperature : with prescribed time of transition
3.1 Primary stage of manufacture	11	4.6.6 Bump
3.2 Structurally similar components	11	4.6.7 Vibration
3.3 Subcontracting	11	4.6.8 Shock
3.4 Incorporated components	11	4.6.9 Free fall
3.5 Manufacturer's approval	11	4.6.10 Acceleration, steady state
3.6 Approval procedures	11	4.6.11 Low air pressure
3.7 Procedures for capability approval	12	4.6.12 Dry heat
3.8 Procedures for qualification approval	12	4.6.13 Damp heat, cyclic
3.9 Test procedures	13	4.6.14 Cold
3.10 Screening requirements	13	4.6.15 Climatic sequence
3.11 Rework and repair work	13	4.6.16 Damp heat, steady state
3.12 Certified test records	13	4.6.17 Salt mist, cyclic
3.13 Validity of release	13	4.6.18 Immersion in cleaning solvents
3.14 Release for delivery	13	4.6.19 Radiation hardness
3.15 Unchecked parameters	13	4.6.20 Flammability test
Section 4. Test and measurement procedures		4.7 Endurance test procedure
4.1 General	13	4.7.1 Ageing
4.2 Test and measurement conditions	13	Figure 1 — Test circuit for insertion attenuation, phase and group delay measurement
4.2.1 Standard conditions for testing	13	Figure 2 — Test circuit for return attenuation measurement
4.2.2 Uncertainty of measurement	14	Figure 3 — Test circuit for intermodulation distortion measurement
4.2.3 Precautions	14	
4.2.4 Alternative test methods	14	
4.3 Visual inspection	14	
4.4 Dimensioning and gauging procedures	14	
4.5 Electrical test procedures	15	
4.5.1 General	15	
4.5.2 Insertion attenuation	15	
4.5.3 Insertion attenuation as a function of temperature	16	
4.5.4 Insertion phase shift	16	
4.5.5 Insertion phase shift as a function of temperature	16	
4.5.6 Envelope delay time	17	
4.5.7 Envelope delay time as a function of temperature	17	

Section 1. Scope

This document specifies the methods of test and general requirements for piezoelectric filters of assessed quality using either capability approval or qualification approval procedures.

Section 2. General

2.1 Order of precedence

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

- the detail specification
- the sectional specification
- the generic specification
- the FEN internal regulations
- 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.

2.2 Related documents

ISO 1000:1973, *SI units and recommendations for use of their multiples and of certain other units*.

IEC 27-1:1971, *Letter symbols to be used in electrical technology — Part 1: General*.

IEC 27-2:1972, *Letter symbols to be used in electrical technology — Part 2: Telecommunications and electronics*.

IEC 50, *International Electrotechnical Vocabulary*.

IEC 50(561), *International Electrotechnical Vocabulary — Chapter 561: Piezoelectric devices for frequency control and selection*.

IEC 68, *Basic environmental testing procedures*.

IEC 68-1:1988, *Part 1: General and guidance*.

IEC 68-2, *Part 2: Tests*.

IEC 68-2-1:1990, *Test A: Cold*.

IEC 68-2-2:1974, *Test B: Dry heat*.

IEC 68-2-2:1976, *Supplement A*.

IEC 68-2-3:1969, *Test Ca: Damp heat, steady state*.

IEC 68-2-3:1984, *Amendment No. 1*.

IEC 68-2-6:1982, *Test Fc and guidance: Vibration (sinusoidal)*.

IEC 68-2-6:1983, *Amendment No. 1*.

IEC 68-2-6:1985, *Amendment No. 2*.

IEC 68-2-7:1983, *Test Ga: Acceleration, steady state*.

IEC 68-2-7:1986, *Amendment No. 1*.

IEC 68-2-10:1988, *Test J: Mould growth*.

IEC 68-2-13:1983, *Test M: Low air pressure*.

IEC 68-2-14:1984, *Test N: Change of temperature*.

IEC 68-2-14:1986, *Amendment No. 1*.

IEC 68-2-17:1978, *Test Q: Sealing*.

IEC 68-2-17:1989, *Amendment No. 3*.

IEC 68-2-20:1979, *Test T: Soldering*.

IEC 68-2-20:1986, *Amendment No. 1*.

IEC 68-2-20:1987, *Amendment No. 2*.

IEC 68-2-21:1983, *Test U: Robustness of terminations*.

IEC 68-2-21:1985, *Amendment No. 1*.