Fixed resistors for use in electronic equipment - Part 1: Generic specification

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

S E EVS-EN 60115-1:2011 E EN 60115-1:2011 S EVS E E 0 11 2011 S E S	E EVS-EN 60115-1:2011 E E EN 60115-1:2011 E S E 0 11 2011 E S

EVS-

-

S 1 0 0 10

V :

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60115-1

November 2011

ICS 31.040.10

Supersedes EN 60115-1:2001 + A1:2001 + A11:2007

English version

Fixed resistors for use in electronic equipment - Part 1: Generic specification

(IEC 60115-1:2008, modified)

Résistances fixes utilisées dans les équipements électroniques - Partie 1: Spécification générique (CEI 60115-1:2008, modifiée)

Festwiderstände zur Verwendung in Geräten der Elektronik - Teil 1: Fachgrundspezifikation (IEC 60115-1:2008, modifiziert)

This European Standard was approved by CENELEC on 2011-08-15. 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60115-1:2011 E

Contents

Figures

Tables

Foreword

This document EN 60115-1 consists of the text of IEC 60115-1:2008 prepared by IEC TC 40, Capacitors and resistors for electronic equipment, together with the common modifications prepared by the Technical Committee CENELEC TC 40XB, Resistors.

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) 2012-08-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-08-15

This document supersedes EN 60115-1:2001 + A1:2001 + A11: 2007.

European common modifications to the text of IEC 60115-1:2008 are incdicated by a vertical line in the left margin of the text.

Clauses, subclauses, notes, tables and figures which are additional to those in IEC 60115-1:2008 are prefixed “Z”.

Preceding documents on the subject covered by this specification have been:
- EN 140000:1993-12
- CECC 40 000:1973-00, 1979:00

Compared to EN 60115-1:2001, the following changes have been implemented:

— revision of the terms and definitions in 2.2;
— removal of the property “temperature characteristics” from 4.8;
— revision of the solderability test in 4.17;
— revision of the resistance to soldering heat test in 4.18;
— introduction of new bias voltages for the damp heat, steady-state test in 4.24;
— revision of Clause 4.25;
— introduction of new test severities for the single-pulse high-voltage overload test on 4.27;
— introduction of a new system of test severities for the shear test in 4.32;
— deletion of the seal test in 4.36;
— introduction of the operation at low temperature test in 4.36, as a replacement of 4.38;
— revision of the damp heat, steady state, accelerated test in 4.37, as a replacement of 4.39, with introduction of a new test severity
— introduction of the electrostatic discharge test in 4.38, as a replacement of 4.40;
— revision of the periodic-pulse overload test in 4.39, as a replacement of 4.37;
— introduction of a whisker growth test in 4.40;
— deletion of normative Annex A;
— revision of normative Annex B;
— deletion of normative Annexes D and E;
— introduction of informative Annexes F and G;
— revision of normative Annex Q, as a replacement of Clause 3;
— revision of informative Annex ZA;
— revision of normative Annex ZR, as a replacement of Annex ZB;
— editorial revision.

See also the cross reference of informative Annex ZX.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

Endorsement notice

The text of the International Standard IEC 60115-1:2008 was approved by CENELEC as a European Standard with common modifications.

1 General

1.1 Scope

This part of EN 60115 is a generic specification and is applicable to fixed resistors for use in electronic equipment.

It establishes standard terms, inspection procedures and methods of test for use in sectional and detail specifications of electronic components for quality assessment or any other purpose.

1.2 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.

EN 60027-1, *Letter symbols to be used in electrical technology - Part 1: General (IEC 60027-1)*

EN 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements* (IEC 60060-1:2010)

EN 60062, *Marking codes for resistors and capacitors (IEC 60062)*

EN 60068-1:1994, *Environmental testing - Part 1: General and guidance (IEC 60068-1:1988 + A1:1992 + corrigendum Oct. 1988)*

EN 60068-2-1, *Environmental testing - Part 2-1: Tests - Test A: Cold (IEC 60068-2-1)*

EN 60068-2-2, *Environmental testing - Part 2-2: Tests - Test B: Dry heat (IEC 60068-2-2)*

EN 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6)*

EN 60068-2-11, *Environmental testing - Part 2: Tests - Test Ka: Salt mist (IEC 60068-2-11)*

EN 60068-2-13, *Environmental testing - Part 2: Tests - Test M: Low air pressure, (IEC 60068-2-13)*

EN 60068-2-14, *Environmental testing - Part 2-14: Tests - Test N: Change of temperature (IEC 60068-2-14)*

EN 60068-2-20:2008, *Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads (IEC 60068-2-20:2008)*

EN 60068-2-21, *Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices (IEC 60068-2-21)*

EN 60068-2-27, *Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock (IEC 60068-2-27)*

EN 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30)*

EN 60068-2-45, *Environmental testing - Part 2: Tests - Test Xa and guidance: Immersion in cleaning solvents (IEC 60068-2-45)*

EN 60068-2-54, *Environmental testing - Part 2-54: Tests - Test Ta: Solderability testing of electronic components by the wetting balance method (IEC 60068-2-54)*

EN 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) (IEC 60068-2-58)*

EN 60068-2-67:1996, *Environmental testing - Part 2: Tests - Test Cy: Damp heat, steady state, accelerated test primarily intended for components (IEC 60068-2-67:1995)*

EN 60068-2-69, *Environmental testing - Part 2-69: Tests - Test Te: Solderability testing of electronic components for surface mounting devices (SMD) by the wetting balance method (IEC 60068-2-69)*

EN 60068-2-78, *Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state (IEC 60068-2-78)*

EN 60068-2-82:2007, *Environmental testing - Part 2-82: Tests - Test XW1: Whisker test methods for electronic and electric components (IEC 60068-2-82:2007 + corrigendum Dec. 2009)*

EN 60286 (all parts), *Packaging of components for automatic handling*

EN 60695-11-5:2005, *Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance (IEC 60695-11-5:2004)*

EN 61193-2, *Quality assessment systems - Part 2: Selection and use of sampling plans for inspection of electronic components and packages (IEC 61193-2)*

EN 61249-2-7, *Materials for printed boards and other interconnecting structures - Part 2-7: Reinforced base materials, clad and unclad - Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad (IEC 61249-2-7)*

EN 61249-2-22, *Materials for printed boards and other interconnecting structures - Part 2-22: Reinforced base materials, clad and unclad - Modified non-halogenated epoxide woven E-glass laminated sheets of defined flammability (vertical burning test), copper-clad (IEC 61249-2-22)*

EN 61249-2-35, *Materials for printed boards and other interconnecting structures - Part 2-35: Reinforced base materials, clad and unclad - Modified epoxide woven E-glass laminate sheets of defined flammability (vertical burning test), copper-clad for lead-free assembly (IEC 61249-2-35)*

EN 61340-3-1, *Electrostatics - Part 3-1: Methods for simulation of electrostatic effects - Human body model (HBM) electrostatic discharge test waveforms (IEC 61340-3-1)*

EN 61760-1, *Surface mounting technology - Part 1: Standard method for the specification of surface mounting components (SMDs) (IEC 61760-1)*

EN 61760-2, *Surface mounting technology - Part 2: Transportation and storage conditions of surface mounting devices (SMD) - Application guide (IEC 61760-2)*

IEC 60050 (all parts), *International Electrotechnical Vocabulary*

IEC 60063:1963, *Preferred number series for resistors and capacitors*
A1:1967
A2:1977

IEC 60195, *Method of measurement of current noise generated in fixed resistors*

IEC 60294:1969, *Measurement of the dimensions of a cylindrical component having two axial terminations*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC/TR 60440, *Method of measurement of non-linearity in resistors*

IEC 60617, *Graphical symbols for diagrams*

IEC QC 001002-2:1998, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of procedure – Part 2: Documentation*

IEC QC 001002-3:2005, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of procedure – Part 3: Approval procedures*

IEC QC 210000, *Technology Approval Schedules – Requirements under the IECQ Quality Assessment System for Electronic Components*

ISO 80000-1, *Quantities and unitis – Part 1: General*