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Fasta motstånd för elektronikutrustningar – Del 2: Grupp-specifikation för metall- och kolfilmsmotstånd för låg effekt, för hålmontering

Fixed resistors for use in electronic equipment –

Part 2: Sectional specification: Low power film resistors with leads for through-hole assembly on circuit boards (THT)

Som svensk standard gäller europastandarden EN IEC 60115-2:2026. Den svenska standarden innehåller de officiella engelska språkversionerna av EN IEC 60115-2:2026 och EN IEC 60115-2:2026/A11:2026.

Nationellt förord

Europastandarden EN IEC 60115-2:2026

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60115-2, Fourth edition, 2023 - Fixed resistors for use in electronic equipment – Part 2: Sectional specification: Low power film resistors with leads for through-hole assembly on circuit boards (THT)**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60115-2, utg 1:2015 med eventuella tillägg, ändringar och rättelser gäller ej fr o m 2029-04-30

ICS 31.040.10

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English Version

**Fixed resistors for use in electronic equipment - Part 2: Sectional specification: Low-power film resistors with leads for through-hole assembly on circuit boards (THT)
(IEC 60115-2:2023)**

Résistances fixes utilisées dans les équipements électroniques - Partie 2: Spécification intermédiaire: Résistances à broches à couche, à faible dissipation, pour assemblage par trous traversants sur cartes de circuit imprimé (carte THT)
(IEC 60115-2:2023)

Festwiderstände zur Verwendung in Geräten der Elektronik - Teil 2: Rahmenspezifikation: Niedrigbelastbare Schichtwiderstände mit Drahtanschlüssen für Durchsteckmontage auf Leiterplatten (THT)
(IEC 60115-2:2023)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

European foreword

This document (EN IEC 60115-2:2026) consists of the text of document IEC 60115-2:2023, prepared by IEC/TC 40 "Capacitors and resistors for electronic equipment".

The following dates are fixed:

- latest date by which this document has to be (dop) 2027-04-30 implemented at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards (dow) 2029-04-30 conflicting with this document have to be withdrawn

This document supersedes EN 60115-2:2015 and all of its amendments and corrigenda (if any).

This document is read in conjunction with EN IEC 60115-2:2026/A11:2026.

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

- a) this edition employs a new document structure of the generic specification EN 60115-1:2023, where the tests of prior Clause 4 are given in Clauses 6 to 12 now;
- b) the definitions of product technologies and product classification levels of the generic specification, EN 60115-1:2023, have been adopted;
- c) the preferred dimensions given in Table 1 have been reviewed, and the legacy style RA-0922 has been removed;
- d) a basis for the optional specification of the lead eccentricity of axial leaded resistors has been amended in 4.2;
- e) the 'periodic-pulse high-voltage overload test' of EN 60115-1:2023, 8.3 has been adopted as default test method in 5.3.8, thereby replacing the legacy test 'periodic-pulse overload test' of EN 60115-1:2023, 8.4;
- f) the revised solderability test of EN 60115-1:2023, 11.1 has been adopted in 5.3.19 and 5.3.20;
- g) the combined solvent resistance test of EN 60115-1:2023, 11.3 has been adopted in 5.3.22;
- h) the 'endurance at room temperature test' of EN 60115-1:2023, 7.2 (prior Annex C of EN 60115-2:2015) has been adopted as an optional test in 5.4.1;
- i) the 'single-pulse high-voltage overload test' of EN 60115-1:2023, 8.2, applied with the pulse shape 10/700 in 5.3.7, is complemented with the optional alternative provided by the pulse shape 1,2/50 in 5.4.2;
- j) climatic tests for 'operation at low temperature' of EN 60115-1:2023, 10.2, and for 'damp heat, steady state, accelerated' of EN 60115-1:2023, 10.5, have been adopted as optional tests in 5.4.4. and 5.4.5, respectively;
- k) new guidance is provided in 6.2 on the presentation of stability requirements with their permissible absolute and relative deviations;
- l) acceptance criteria for the visual examination have been added in 6.5 and in Annex B;
- m) visual examination for the primary and proximity packaging has been added in 6.5.2 and in 7.2
- n) the periodical evaluation of termination platings has been added as a new topic of quality assessment in 9.8;

- o) a new Annex C has been added to summarize workmanship requirements for the assembly of leaded film resistors, e.g. as given in the prior IEC 61192 series of standards;
- p) the informative Annex F (prior Annex B) on radial formed styles has been amended with details on a formed Z-bend style for surface-mount assembly.

Preceding documents on the subject covered by this specification have been:

- EN 60115-2:2015
- EN 140100:2008-02, EN 140100:1996-11 + EN 140100:1996-11/A1:2001-08
- CECC 40 100:1980-00, 1973-00

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.

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Endorsement notice

The text of the International Standard IEC 60115-2:2023 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 standard indicated:

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IEC 60068-2-1	NOTE	Approved as EN IEC 60068-2-1
IEC 60068-2-2	NOTE	Approved as EN IEC 60068-2-2
IEC 60068-2-13	NOTE	Approved as EN IEC 60068-2-13
IEC 60068-2-14	NOTE	Approved as EN IEC 60068-2-14
IEC 60068-2-21	NOTE	Approved as EN IEC 60068-2-21
IEC 60068-2-30	NOTE	Approved as EN IEC 60068-2-30
IEC 60068-2-45	NOTE	Approved as EN 60068-2-45
IEC 60068-2-78	NOTE	Approved as EN IEC 60068-2-78
IEC 60195	NOTE	Approved as EN 60195
IEC 60286-2	NOTE	Approved as EN IEC 60286-2
IEC 60440	NOTE	Approved as EN 60440
IEC 60695-11-5	NOTE	Approved as EN 60695-11-5
IEC 60717	NOTE	Approved as EN 60717
IEC 61191-1	NOTE	Approved as EN IEC 61191-1
IEC 61191-3	NOTE	Approved as EN 61191-3
IEC 61760-1	NOTE	Approved as EN IEC 61760-1
IEC 80000 series	NOTE	Approved as EN IEC 80000 series
ISO 80000 series	NOTE	Approved as EN ISO 80000 series

INTERNATIONAL STANDARD

**Fixed resistors for use in electronic equipment –
Part 2: Sectional specification: Low-power film resistors with leads for through-hole assembly on circuit boards (THT)**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –**Part 2: Sectional specification: Low-power film resistors with leads
for through-hole assembly on circuit boards (THT)**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60115-2 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

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

- a) the definitions of product technologies and product classification levels of the generic specification, IEC 60115-1:2020, have been adopted;
- b) the preferred dimensions given in Table 1 have been reviewed, and the legacy style RA_0922 has been removed;
- c) a basis for the optional specification of the lead eccentricity of axial leaded resistors has been amended in 4.2;

- d) the 'period-pulse high-voltage overload test' of IEC 60115-1:2020, 8.3 has been adopted as default test method in 5.3.8, thereby replacing the legacy test 'periodic-pulse overload test' of IEC 60115-1:2020, 8.4;
- e) the revised solderability test of IEC 60115-1:2020, 11.1 has been adopted in 5.3.19 and 5.3.20;
- f) the combined solvent resistance test of IEC 60115-1:2020, 11.3 has been adopted in 5.3.22;
- g) the 'endurance at room temperature test' of IEC 60115-1:2020, 7.2 (prior IEC 60115 2:2014, Annex C) has been adopted as an optional test in 5.4.1;
- h) the 'single-pulse high-voltage overload test' of IEC 60115 1:2020, 8.2, applied with the pulse shape 10/700 in 5.3.7, is complemented with the optional alternative provided by the pulse shape 1,2/50 in 5.4.2;
- i) climatic tests for 'operation at low temperature' of IEC 60115-1:2020, 10.2, and for 'damp heat, steady state, accelerated' of IEC 60115-1:2020, 10.5, have been adopted as optional tests in 5.4.4 and 5.4.5, respectively;
- j) new guidance is provided in 6.2 on the presentation of stability requirements with their permissible absolute and relative deviations;
- k) acceptance criteria for the visual examination have been added in 6.5 and in Annex B;
- l) visual examination for the primary and proximity packaging has been added in 6.5.2 and in 7.2;
- m) the periodical evaluation of termination platings has been added as a new topic of quality assessment in 9.8;
- n) the revised test clause numbering of IEC 60115-1:2020 has been applied;
- o) a new Annex C has been added to summarize workmanship requirements for the assembly of leaded film resistors, e.g. as given in the prior IEC 61192 series of standards;
- p) the informative Annex F (prior Annex B) on radial formed styles has been amended with details on a formed Z-bend style for surface-mount assembly.

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

Draft	Report on voting
40/2943/CDV	40/3001/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.

A list of all parts in the IEC 60115 series, published under the general title *Fixed resistors for use in electronic equipment*, can be found on the IEC website.

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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 2: Sectional specification: Low-power film resistors with leads for through-hole assembly on circuit boards (THT)

1 Scope

This part of IEC 60115 is applicable to fixed low-power film resistors with termination leads for use in electronic equipment, which are typically assembled in through-hole technology (THT) on circuit boards.

These resistors are typically described according to types (different geometric shapes) and styles (different dimensions) and product technology. The resistive element of these resistors is typically protected by a conformal lacquer coating. These resistors have wire terminations and are primarily intended to be mounted on a circuit board in through-hole technique.

The object of this document is to state preferred ratings and characteristics and to select from IEC 60115-1 the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of resistor.

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 60062:2016, *Marking codes for resistors and capacitors*

IEC 60063:2015, *Preferred number series for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-20:2021, *Environmental testing – Part 2-20: Tests – Test Ta and Tb – Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60115-1:2020, *Fixed resistors for use in electronic equipment – Part 1: Generic specification*

IEC 60286-1, *Packaging of components for automatic handling – Part 1: Tape packaging of components with axial leads on continuous tapes*

IEC 60294:2012, *Measurement of the dimensions of a cylindrical component with axial terminations*

IEC 60301, *Preferred diameters of wire terminations of capacitors and resistors*

IEC 61193-2:2007, *Quality assessment systems – Part 2: Selection and use of sampling plans for inspection of electronic components and packages*