Tabelle X.2 – Verweisliste zu den Bildern

IEC 60115-2:2014 dritte Ausgabe Bild	IEC 60115-2:202X vierte Ausgabe Bild	Anmerkungen
1	3	
2	4	
3	5	
4	7	
5	8a	
6	8b	
7	9	
B.1	F.1	
B.2	F.2	
B.3	F.3	
B.4	F.4	
B.5	F.5	
C.1	—	Der Inhalt wird in IEC 60015-1:201X, 7.2, behandelt
C.2		

Tabelle X.3 – Verweisliste zu den Tabellen

IEC 60115-2:2014 dritte Ausgabe Tabelle	IEC 60115-2:202X vierte Ausgabe Tabelle	Anmerkungen
1	1	
2	2	
3	4	
4	5	
5	6	
6	7	
B.1	F.1	
B.2	F.2	

Literaturhinweise

EN 60027-1, *Formelzeichen für die Elektrotechnik – Teil 1: Allgemeines* (IEC 60027-1)

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

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

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

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

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

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

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

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

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

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

IEC 60286-2, *Packaging of components for automatic handling – Part 2: Packing of components with unidirectional leads on continuous tapes*

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

IEC 60695-11-5, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 60717, *Method for the determination of the space required by capacitors and resistors with unidirectional terminations*

IEC 61191-1, *Printed board assemblies – Part 1: Generic specification – Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies*

IEC 61191-3, *Printed board assemblies – Part 3: Sectional specification – Requirements for through-hole mount soldered assemblies*

IEC 61192-1:2003, *Workmanship requirements for soldered electronic assemblies – Part 1: General*

Anmerkung zum Begriff IEC 61192-1:2003 wurde 2018 zurückgezogen.

IEC 61192-3:2002, *Workmanship requirements for soldered electronic assemblies - Part 3: Through-hole mount assemblies*

Anmerkung zum Begriff IEC 61192-3 wurde 2018 zurückgezogen.

IEC 61340-3-1, *Methods for simulation of electrostatic effects – Human body model (HBM) – Component testing*

IEC 80000 (alle Teile), *Quantities and units*

IECQ 03-3, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure – Part 3: IECQ Approved Component Products, Related Materials & Assemblies Scheme*

IECQ 03-3-1, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure – Part 3-1: IECQ Approved Component Products, Related Materials & Assemblies Scheme, IECQ Approved Component – Technology Certification (IECQ AC-TC)*

ISO 3, *Preferred numbers – Series of preferred numbers*

ISO 17, *Guide to the use of preferred numbers and of series of preferred numbers*

ISO 497, *Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers*

ISO 2533, *Standard atmosphere*

ISO 80000 (alle Teile), *Quantities and units*

IPC A-610, *Acceptability of electronic assemblies*

CONTENTS

143 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 2: Sectional specification: Leaded fixed low power film resistors

FOREWORD

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International Standard IEC 60115-2 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

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

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

178 a) the definitions of product technologies and product classification levels of the generic
179 specification, IEC 60115-1:201X, have been adopted;

180 b) a basis for the optional specification of the lead eccentricity of axial leaded resistors has
181 been amended in 4.2;

182 c) the 'period-pulse high-voltage overload test' of IEC 60115-1:201X, 8.3 has been adopted
183 as default test method in 5.3.8, thereby replacing the legacy test 'periodic-pulse overload
184 test' if IEC 60115-1:201X, 8.4;

d) the revised solderability test of IEC 60115-1:201X, 11.1 has been adopted in 5.3.19 and 5.3.20;

e) the combined solvent resistance test of IEC 60115-1:201X, 11.3 has been adopted in in 5.3.22;

f) the 'endurance at room temperature test' of IEC 60115-1:201X, 7.2 (prior Annex C of IEC 60115-2:2014) has been adopted as an optional test in 5.4.1;

g) the 'single-pulse high-voltage overload test' of IEC 601115-1:201X, 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;

h) climatic tests for 'operation at low temperature' of IEC 60115-1:201X, 10.2, and for 'damp heat, steady state, accelerated' of IEC 60115-1:201X, 10.4, have been adopted as optional tests in 5.4.4. and 5.4.5, respectively;

i) new guidance is provided in 6.2 on the presentation of stability requirements with their permissible absolute and relative deviations;

j) acceptance criteria for the visual inspection have been added in 6.5 and in Annex B;

k) visual inspection for the primary and proximity packaging has been added in 6.5.2 and in 7.2

l) the periodical evaluation of termination platings has been added as a new topic of quality assessment in 9.8;

m) the revised test clause numbering of IEC 60115-1:201X has been applied;

n) 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;

o) 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 standard is based on the following documents:

FDIS	Report on voting
40/XX/FDIS	40/XX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 2: Sectional specification: Leaded fixed low-power film resistors

1 Scope

This part of IEC 60115 is applicable to leaded fixed low-power film resistors for use in electronic equipment.

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 standard is to prescribe 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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests - Test A: Cold*

IEC 60068-2-2, *Basic environmental testing procedures – Part 2-2: Tests - Tests B: Dry heat*

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

IEC 60068-2-20:2008, *Environmental testing – Part 2-20: Tests – Test T – Test methods for solderability and resistance to soldering heat of leaded devices*

IEC 60115-1:201X, *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 having two 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*

IEC 61760-1:2006, *Surface mounting technology – Part 1: Standard method for the specification*