

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

1	FOREWORD.....	6
2	1 Scope.....	8
3	2 Normative references	8
4	3 Terms and definitions	9
5	3.1 Terms	9
6	3.2 Product technologies	9
7	3.3 Product classification	10
8	4 Preferred characteristics.....	10
9	4.1 General.....	10
10	4.2 Style and dimensions.....	10
11	4.3 Preferred climatic categories.....	13
12	4.4 Resistance.....	13
13	4.5 Tolerances on resistance	13
14	4.6 Rated dissipation P_{70}	13
15	4.7 Limiting element voltage U_{\max}	14
16	4.8 Insulation voltage U_{ins}	14
17	4.9 Insulation resistance R_{ins}	14
18	5 Tests and test severities	15
19	5.1 General provisions for tests invoked by this specification	15
20	5.2 Preparation of specimens	15
21	5.3 Tests	20
22	5.4 Optional and/or additional tests.....	29
23	6 Performance requirements	31
24	6.1 General.....	31
25	6.2 Limits for change of resistance at tests	31
26	6.3 Temperature coefficient of resistance	34
27	6.4 Temperature rise	34
28	6.5 Visual inspection.....	35
29	6.6 Solderability.....	35
30	6.7 Insulation resistance	36
31	6.8 Flammability	36
32	7 Marking, packaging and ordering information.....	36
33	7.1 Marking of the component.....	36
34	7.2 Packaging	36
35	7.3 Marking of the packaging	36
36	7.4 Ordering information	37
37	8 Detail specifications.....	37
38	8.1 General.....	37
39	8.2 Information to be specified in a detail specification	37
40	9 Quality assessment procedures	40
41	9.1 General.....	40
42	9.2 Definitions	40
43	9.3 Formation of inspection lots	40
44	9.4 Approved component (IECQ AC) procedures	41
45	9.5 Qualification approval (QA) procedures.....	41
46	9.6 Capacitance	42

47	9.7	Technology certification (IECQ-AC-TC) procedures	42
48	9.8	Periodical evaluation of termination platings	42
49	9.9	Delayed delivery	42
50	9.10	Certified test records	42
51	9.11	Certificate of conformity (CoC)	42
52		Annex A (normative) Symbols and abbreviated terms	53
53	A.1	Symbols	53
54	A.2	Abbreviated terms	56
55		Annex B (normative) Visual inspection acceptance criteria	58
56	B.1	General	58
57	B.2	Criteria for	58
58	B.3	Criteria for	58
59	B.4	Criteria for	58
60		Annex C (normative) Workmanship requirements for the assembly of leaded film	
61		resistors	59
62	C.1	General	59
63	C.2	Lead forming	59
64	C.3	Mounting	61
65	C.4	Lead trimming	63
66		Annex D (normative) 0 Ω Resistors (Jumper)	65
67	D.1	General	65
68	D.2	Preferred characteristics	65
69	D.3	Tests and test severities	65
70	D.4	Performance requirements	66
71	D.5	Marking, packaging and ordering information	66
72	D.6	Detail specification	66
73	D.7	Quality assessment procedures	67
74		Annex E (informative) Guide on the application of optional and/or additional tests	68
75	E.1	General	68
76	E.2	Endurance at room temperature	68
77	E.3	Single-pulse high-voltage overload test	69
78	E.4	Periodic- pulse overload test	70
79	E.5	Operation at low temperature	70
80	E.6	Damp heat, steady state, accelerated	71
81		Annex F (informative) Radial formed types	73
82	F.1	General	73
83	F.2	Radial formed types for through-hole assembly	75
84	F.3	Radial formed types for surface-mount assembly	79
85	F.4	Packaging	80
86	F.5	Quality assessment	80
87		Annex X (informative) Cross reference for the prior revision of this specification	83
88		Bibliography	86

89	Figure 1 – Illustration of a typical axial leaded resistor	9
90	Figure 2 – Illustrations of typical radial leaded resistors	9
91	Figure 3 – Shape and dimension of axial leaded resistors	11
92	Figure 4 – Alternative methods for specification of the length of excessive protective	
93	coating on axial leaded resistors	11
94	Figure 5 – Lead-wire spacing of axial leaded resistors with bent leads	12
95	Figure 6 – Specification of the lead eccentricity of axial leaded resistors	12
96	Figure 7 – Derating curve	14
97	Figure 8 – Basic layout for mechanical, environmental and electrical tests	17
98	Figure 9 – Assembly of specimen to the test board	18
99	Figure 10 – Mounting of axial leaded specimens on a rack, top view	19
100	Figure 11 – Examples of specimen lead fixation devices	20
101	Figure C.1 – Lead forming dimensions	59
102	Figure C.2 – Examples of mounting height support	60
103	Figure C.3 – Clearance between coating and solder	61
104	Figure C.4 – Lateral mounting	62
105	Figure C.5 – Upright mounting	63
106	Figure C.6 – Lead protrusion	64
107	Figure C.7 – Lead end distortion	64
108	Figure F.1 – Shape and dimensions of radial formed resistor for lateral body position	75
109	Figure F.2 – Shape and dimensions of radial formed resistor for lateral body position	
110	with kinked lead wires	75
111	Figure F.3 – Shape and dimensions of radial formed resistor for upright body position	76
112	Figure F.4 – Shape and dimensions of radial formed resistor for upright body position	
113	and wide spacing	77
114	Figure F.5 – Shape and dimensions of radial formed resistor for upright body position	
115	and wide spacing, with kinked lead wire	77
116	Figure F.6 – Shape and dimensions of radial formed resistor for surface-mount	
117	assembly (Z-bend)	79
118	Figure F.7 – Land pattern dimensions for surface-mount assembly	79
119		
120	Table 1 – Preferred styles of axial leaded resistors	10
121	Table 2 – Test board dimensions	16
122	Table 3 – Preferred aggravated overload conditions	23
123	Table 4 – Limits for the change of resistance at tests	33
124	Table 5 – Permitted change of resistance due to the variation of temperature	34
125	Table 6 – Test schedule for the qualification approval	43
126	Table 7 – Test schedule for the quality conformance inspections	48
127	Table C.1 – Lead bend radius	60
128	Table C.2 – Recommended circuit board bore diameters	61
129	Table C.3 – Clearance of lateral mounted resistors	62
130	Table E.1 – Implementation of the test endurance at room temperature	68
131	Table E.2 – Implementation of the single-pulse high-voltage overload test	69
132	Table E.3 – Implementation of the periodic-pulse overload test	70
133	Table E.4 – Impl	71

134	Table E.5 – Implementation of the test damp heat, steady state, accelerated.....	72
135	Table F.1 – Feasible lead-wire spacing of radial formed resistor for	
136	lateral body position.....	76
137	Table F.2 – Feasible lead-wire spacing of radial formed resistor for	
138	upright body position.....	78
139	Table X.1 – Cross reference for references to clauses	83
140	Table X.2 – Cross reference for references to figures	85
141	Table X.3 – Cross reference for references to table	85
142		

143

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

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

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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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:

- a) the definitions of product technologies and product classification levels of the generic specification, IEC 60115-1:201X, have been adopted;
- b) a basis for the optional specification of the lead eccentricity of axial leaded resistors has been amended in 4.2;
- c) the 'period-pulse high-voltage overload test' of IEC 60115-1:201X, 8.3 has been adopted as default test method in 5.3.8, thereby replacing the legacy test 'periodic-pulse overload 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 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 60115-1:201X, 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*