

INTERNATIONAL STANDARD

**Fixed resistors for use in electronic equipment -
Part 8-10: Blank detail specification: Surface mount (SMD) low-power film
resistors for assembly on circuit boards, for general electronic equipment,
classification level G**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Fixed resistors for use in electronic equipment -
Part 8-10: Blank detail specification: Surface mount (SMD)
low-power film resistors for assembly on circuit boards,
for general electronic equipment, classification level G**

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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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60115-8-10 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This edition includes the following significant technical changes with respect to the previous edition IEC 60115-8-1:2014:

- a) it supports solderability testing for both traditional lead-bearing soldering and up-to-date lead-free soldering, as required;
- b) it supports the provision of detailed visual acceptance criteria;
- c) it includes the requirement for a visual examination of the primary and proximity packaging;
- d) it provides for the inclusion of specific visual acceptance criteria, to be applied in addition to those given in Annex B of the sectional specification IEC 60115-8:2023.

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

Draft	Report on voting
40/3264/CDV	40/3309/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.

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

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

0 Introduction to the template provided by this blank detail specification

COMMENT This introduction is not intended to be copied into the drafted detail specification. Therefore, it is positioned in front of the conventional document structure and clause numbering range. It nevertheless contains normative requirements to the drafted detail specification.

0.1 Scope of this blank detail specification

This part of IEC 60115-8 is applicable to the drafting of detail specifications for surface mount (SMD) low-power film resistors, classified to level G, based on the definition of the product classification levels in IEC 60115-1:2020, 3.4.

Another part of IEC 60115-8 provides a separate blank detail specification for the drafting of detail specifications for surface mount (SMD) low-power film resistors, classified to level P and to level R.

Yet other parts of IEC 60115-8 may be issued to provide blank detail specifications for the drafting of detail specifications for surface mount (SMD) resistors, of other technologies or of other classification levels.

0.2 Function of this blank detail specification

A blank detail specification is a supplementary document to the sectional specification and contains requirements for style, layout and minimum contents of detail specifications. Detail specifications not complying with these requirements shall not be accepted as being in accordance with IEC specifications nor shall they be described as such.

Detail specifications complying with the requirements of this blank detail specification are a legitimate basis for the quality assessment of leaded fixed low-power film resistors under an adequate quality assessment system, e.g. the IEC Quality Assessment System for Electronic Components (IECQ System), whereas the plain blank detail specification is not a suitable basis.

The detail specification should contain a table of contents prior the first page of the actual specification.

In the preparation of the detail specification, the content of IEC 60115-8:2023, 8.2 shall be taken into account. The detail specification should be written by using the preferred values given in IEC 60115-8.

Units, graphical symbols and letter symbols shall, whenever possible, be taken from those prescribed by the following standards:

- IEC 60027-1, *Letter symbols to be used in electrical technology - Part 1: General*
- IEC 60617, *Graphical symbols for diagrams*
- IEC 80000 (all parts), *Quantities and units*
- ISO 80000 (all parts), *Quantities and units*

This blank detail specification uses for its purpose two different kinds of notes:

- NOTE For notes which give additional information intended to assist the understanding or use of the resulting document and therefore shall be copied as NOTE into the drafted detail specification. As outlined in the ISO/IEC directives, these notes shall not contain any requirement, instruction, recommendation or permission.
- COMMENT For editorial notes which are intended to aid and direct the specification writer and therefore shall not be copied into the drafted detail specification. In order to accomplish their function, editorial notes require the use of instructions, recommendations and permissions addressed to the writer of the detail specification.

0.3 Identification of the detail specification and the resistor

The first page of the detail specification should have a layout starting with a title block as recommended on the following page.

The numbers in square brackets are editorial references, which are not intended to be copied into the drafted detail specification, and which correspond to the following information on the contents which shall be inserted in the indicated fields.

- [1] The name of the standardisation organisation under whose authority the detail specification is published and, if applicable, the organization from whom the detail specification is available.
- [2] The number allocated to the detail specification by the IEC or by the responsible standardisation organisation, together with the date of issue and issue number, as applicable. Further reference details required by the responsible standardisation organisation or quality assessment system may be given here, including an established mark of conformity, as applicable.
- [3] The number and issue date and number, as applicable, of the relevant generic specification, sectional specification and blank detail specification, where the referenced issues shall be the most recent issues of the respective specifications.
- [4] The title of the detail specification, providing a short description of the type of resistors.
This entry should support the discrimination between similar specifications and should be suitable for an entry in a register of approvals or in a catalogue of standards. It may duplicate information given in fields [6] and [7] and in the textual scope in Clause 1.
- [5] An outline drawing or illustration of the products. This entry should aid the easy recognition of the specified resistors and, if possible, support the discrimination between similar specifications. It may duplicate information given in Figure 1.
- [6] Information on the typical construction of the resistors (where applicable), information of the specified resistors being insulated or non-insulated (see IEC 60115-1:2020, 3.1.7), and information on compatibility with a specific soldering process (if applicable, see 8.4). This entry may duplicate information given in the textual scope in Clause 1.
- [7] The classification level of the resistors covered by this detail specification, the level of quality assessment (Assessment level EZ), and the general level of stability requirements at performance tests (Stability class).
This information may duplicate information given in the textual scope in Clause 1.
- [8] Optional field for table notes.
- [9] Statement(s) about the availability of information on components qualified to this detail specification, if applied within a full quality assessment system.

Example for the use within the IECQ system:

Information about components qualified to this detail specification is available in the approvals section of the website <http://www.iecq.org>.

Specification available from:	IEC 60115-8-10xx:20yy
[1]	[2]
Electronic components of assessed quality in accordance with: Generic specification: IEC 60115-1:2020 [3] Sectional specification: IEC 60115-8:2023 Blank detail specification: IEC 60115-8-10:2026	
FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT – Part 8-10xx: Detail specification – Surface mount (SMD) low-power film resistors for assembly on circuit boards, ..., for general electronic equipment, classification level G	
[5]	Technology ... [6] Insulated / Non-insulated Termination plating ...
	Product classification level G Assessment level EZ [7] Stability classes ...
[8]	

COMMENT The remainder of this page is intentionally left empty in order to start Clause 1 on top of the next page.

Information about components qualified to this detail specification is available
[9]

**Fixed resistors for use in electronic equipment -
Part 8-10: Blank detail specification: Surface mount (SMD)
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COMMENT The above title without the introductory word "blank" is to become the title of the intended detail specification, which is drafted on the basis of this blank detail specification.

The actual title of the intended detail specification should hold some wording descriptive for the particular kind of components covered therein, where indicated by "...", in order to support the differentiation between parallel detail specification on the same level. An example for such descriptive wording would be: "rectangular shape, stability classes 0,1; 0,25".

1 Scope

COMMENT The text of this clause may repeat information already given in some fields of the above title block. Essential information on the special type of components covered by the drafted detail specification may be added, preferably at the place marked with "...".

This detail specification specifies the characteristics and ratings of surface mount (SMD) film resistors for use in electronic equipment, which are typically assembled on the surface of circuit boards.

...

The resistors covered herein are classified to level G, as defined in IEC 60115-1:2020, 3.4 for general electronic equipment, typically operated under benign or moderate environmental conditions, where the major requirement is function. Examples for level G include consumer products and telecommunication user terminals.

This detail specification is based upon the blank detail specification IEC 60115-8-10:2026.

This detail specification establishes test schedules and performance requirements permitting the quality assessment of the resistors covered herein according to the quality assessment procedures prescribed by IEC 60115-1:2020, Annex Q.

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, *Preferred number series for resistors and capacitors*

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

IEC 60115-8:2023, *Fixed resistors for use in electronic equipment - Part 8: Sectional specification: Fixed surface mount resistors*

IEC 60115-8-10:2026, *Fixed resistors for use in electronic equipment - Part 8-10: Blank detail specification: Surface mount (SMD) low-power film resistors for assembly on circuit boards, for general electronic equipment, classification level G*

IEC 60286-3, *Packaging of components for automatic handling - Part 3: Packaging of surface mount components on continuous tapes*

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

...

COMMENT 1 The above list of normative references provides an example and needs to be adapted to the actual requirements of the drafted detail specification, indicated by the space marked with "...", which however does not preclude from sorting in proper numerical order.

COMMENT 2 According to the ISO/IEC directives, dated references are required when reference is made to a specific part of the referenced standard and generally should be applied only in such cases.

COMMENT 3 It is recommended to update any dated references to the most recent revision of the referenced standard when drafting a detail specification. This involves updating of the dated normative references within the text of the drafted detail specification.

Bibliography

The following referenced documents are useful for the application of this document, in addition to those listed in Clause 2 as normative references. Many of the documents listed in this bibliography are normative references to a document referenced in this specification; hence a possible dated reference therein takes precedence over the undated entry in this bibliography. When there is no such requirement for a dated reference, the latest edition of the referenced document (including any amendment) applies.

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

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

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

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

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

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

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, *Basic environmental testing procedures - Part 2-45: Tests - Test XA and guidance: Immersion in cleaning solvents*

IEC 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 60068-2-78, *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 60617, *Graphical symbols for diagrams*, available at <http://www.graphical-symbols.info/equipment>

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

IEC 60749-26, *Semiconductor devices - Mechanical and climatic test methods - Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)*

IEC 61192-3¹, *Workmanship requirements for soldered electronic assemblies - Part 3: Through-hole mount assemblies*

IEC 61340-3-1², *Electrostatics - Methods for simulation of electrostatic effects - Human body model (HBM) electrostatic discharge test waveforms*

IEC 80000 (all parts), *Quantities and units*

ISO 80000-5, *Quantities and units - Part 5: Thermodynamics*

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)*

¹ Withdrawn.

² Withdrawn.