

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fixed resistors for use in electronic equipment –
Part 8-1: Blank detail specification: Fixed surface mount (SMD) low power film
resistors for general electronic equipment, classification level G

Résistances fixes utilisées dans les équipements électroniques –
Partie 8-1: Spécification particulière cadre: Résistances fixes à couche et à faible
dissipation pour montage en surface (CMS), pour les équipements électroniques
universels, niveau G de classification



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**Fixed resistors for use in electronic equipment –
Part 8-1: Blank detail specification: Fixed surface mount (SMD) low power film
resistors for general electronic equipment, classification level G**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –**Part 8-1: Blank detail specification:
Fixed surface mount (SMD) low power film resistors
for general electronic equipment, classification level G**

FOREWORD

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International Standard IEC 60115-8-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This second edition cancels and replaces the first edition, published in 1989 and constitutes a technical revision.

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

- It includes minor revisions related to tables, figures and references.

- Dedication to resistors of product classification level G, which is for general electronic equipment, typically operated under benign or moderate environmental conditions, like e.g. consumer products, or telecommunication user terminals.
- Implementation of the zero defect policy with the application of the single assessment level EZ in all test schedules.
- Substitution of the temperature coefficient of resistance (TCR), specified over the full defined temperature range, for the inferior and less significant temperature characteristic.
- Addition of a test for the immunity against electrostatic discharge.
- Implementation of the concept of stability classes with coordinated requirements to the performance at all prescribed tests.
- Addition of information relevant for the component user in his assembly process.
- Addition of an Annex providing special provisions for 0 Ω resistors (jumpers), which may be part of a range of products covered by a detail specification derived from this blank detail specification.

The text of this standard is based on the following documents:

FDIS	Report on voting
40/2297/FDIS	40/2313B/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.

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 web site 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 8-1: Blank detail specification: Fixed surface mount (SMD) low power film resistors for general electronic equipment, classification level G

0 Introduction

COMMENT This introduction is not intended to be copied into the drafted detail specification. Therefore it is positioned prior to 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 fixed surface mount (SMD) low-power film resistors in rectangular chip shape (styles RR) or in cylindrical MELF shape (styles RC) classified to level G, which is defined in IEC 60115-8:2009, 1.5 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.

Another part of IEC 60115-8 provides a separate blank detail specification for the drafting of detail specifications for fixed surface mount (SMD) low-power film resistors in rectangular chip shape (styles RR) or in cylindrical MELF shape (styles RC) classified to level P.

Other parts of IEC 60115-8 may be issued to provide blank detail specifications for the drafting of detail specifications for surface mount resistors of other geometrical shapes, 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 considered as being in accordance with IEC specifications nor shall they so be described.

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

In the preparation of the detail specification, the content of IEC 60118-8:2009, 1.4 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 should, 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*
- ISO 80000 (all parts), *Quantities and units*

This blank detail specification uses for its purpose two different indications:

- NOTE For notes which give additional information intended to assist the understanding or use of the resulting document and therefore they shall be

copied as NOTE into the drafted detail specification. As outlined in the ISO/IEC directives, these notes shall not contain requirements, instructions, recommendations or permissions.

- COMMENT For editorial notes which are intended to aid and direct the specification writer, and therefore they shall not be copied into the drafted detail specification. In order to achieve their function, editorial notes require the use of instructions, recommendations and permissions.

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. They correspond to the following information on the contents which shall be inserted in the indicated positions.

- [1] "International Electrotechnical Commission" or 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 the textual scope in Clause 1.
- [5] An outline drawing or illustration of the products. This entry should aid the easy recognition of the 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). 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.

Specification available from: [1]	IEC 60115-8-1 ...: [2]
Electronic components of assessed quality in accordance with: IEC 60115-1: [3] IEC 60115-8: IEC 60115-8-1:	Fixed low-power film surface mount (SMD) resistors for general electronic equipment, classification level G... [4]
[5]	[6]
	Product classification level G Assessment level EZ [7] Stability classes ...
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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 in the approvals section of the website <http://www.iecq.org>.

1 Scope

COMMENT The text of this clause may repeat information already given in some fields of the above title block.

This detail specification specifies the characteristics and ratings of fixed surface mount (SMD) resistors...

...

The resistors covered herein are classified to level G, as defined in IEC 60115-8: , 1.5 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 establishes test schedules and performance requirements for the quality assessment of the resistors covered herein according to the quality assessment procedures prescribed in IEC 60115-1: , Annex Q.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60062:2004, *Marking codes for resistors and capacitors*

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

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 60115-1:2008, *Fixed resistors for use in electronic equipment – Part 1: Generic specification*

IEC 60115-8:2009, *Fixed resistors for use in electronic equipment – Part 8: Sectional specification – Fixed surface mount resistors*

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

IEC 60286-6, *Packaging of components for automatic handling – Part 6: Bulk case packaging for surface mounting components*

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

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

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.

COMMENT 2 Dated references are required when reference is made to a specific part of the referenced standard, and generally they 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.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60115-1 and in IEC 60115-8, as well as the following, apply.

...

COMMENT The above statement should be reduced to “For the purposes of this document, the terms and definitions given in IEC 60115-1 and in IEC 60115-8 apply.” if no further terms or definitions are required in the drafted detail specification.

4 Characteristics and ratings

4.1 General

Various parameters of this component are precisely defined in this specification. Unspecified parameters may vary from one component to another.

4.2 Dimensions

The shape and dimensions of the resistors covered by this specification are shown in Figure 1, with the specific styles and their respective dimensions given in Table 1. Other shapes are permissible within the given dimensions.

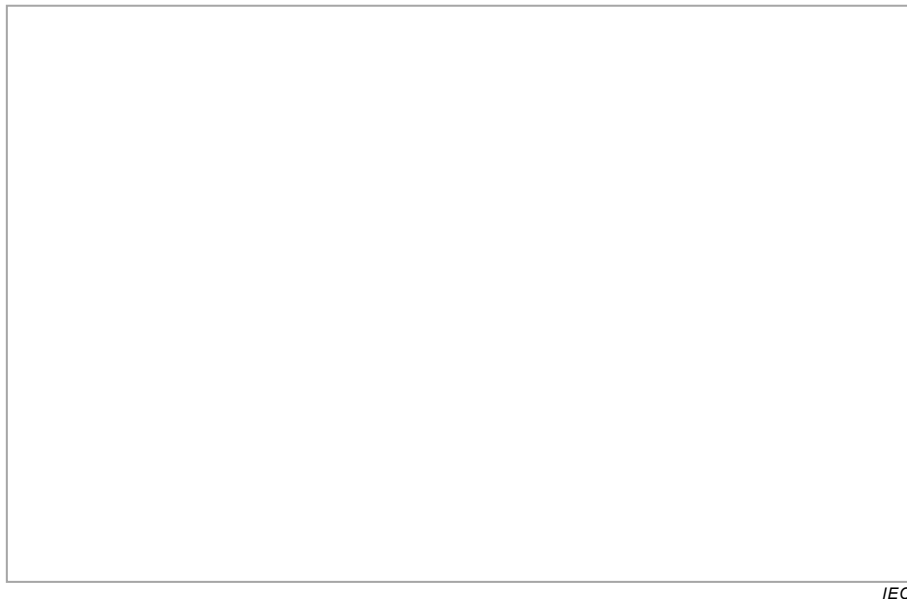


Figure 1 – Outline and dimensions

COMMENT 1 See IEC 60115-8:2009, 1.4.1.

COMMENT 2 The details shown in Figure 1 may repeat information already given in some fields of the title block above. Figure 1 in particular needs to define all dimensions to be prescribed in Table 1.

Table 1 – Styles and dimensions

Style		Dimensions			Mass ^b
Metric	X ^a	<i>L</i> mm	<i>W</i> mm	<i>T</i> mm	<i>m</i> mg

^a Historical style code, for information only.
^b For information only.

COMMENT 3 See IEC 60115-8:2009, 1.4.2.

COMMENT 4 The metric style designation is the normative designation used in all other places throughout this detail specification. Column X is an optional column for additional style information, e.g. for traditional imperial chip dimensions, which generally need to be marked with a respective table footnote, e.g. as “Historical style code, for information only”.

COMMENT 5 The dimensions for length *L*, width *W* and height *H* are given as example based on the requirements for rectangular chip resistors only and need to correspond to the dimensions identified in Figure 1. The choice of prescribed dimensions needs to be adapted to the actual requirements of the drafted detail specification and the shape of products covered therein. The dimensions may be given in the format of nominal values plus tolerance, or by stating permissible minimum and maximum values. Columns for additional dimensions may be inserted as required.

COMMENT 6 The component mass is not intended to be verified by an inspection procedure. It should be given as the maximum mass of a single component and should be marked with a respective table footnote as “For information only”.

4.3 Ratings

The climatic categories applied in this detail specification are given in Table 2.

Table 2 – Climatic categories

Climatic category
LCT / UCT / duration
... / ... / ...
... / ... / ...

COMMENT 1 See IEC 60115-8:2009, 1.4.3.

The upper category temperature (UCT), which is used for test procedures, should be based on the maximum element temperature (MET).

Table 3 – Ratings

Style	Rated dissipation P_{70} mW	X	Limiting element voltage d.c. or a.c. (r.m.s) U_{\max} V	Insulation voltage d.c. or a.c. (peak) U_{ins} V

NOTE The insulation voltage U_{ins} is verified with a test duration of one minute. However, long time insulation properties may be affected by the influence of moisture, organic material and electrical field across the insulating layer(s).

COMMENT 2 See IEC 60115-8:2009, 1.4.8, 1.4.9 and 1.4.10.

COMMENT 3 Column X is an optional column for additional information, e.g. an additional rated dissipation at another ambient temperature than the rated temperature 70 °C.

COMMENT 4 The insulation voltage shall not be specified lower than the peak voltage that can be applied continuously to the resistors and therefore shall not be rated less than $U_{\text{ins}} = 1,42 \cdot U_{\max}$.

COMMENT 5 Different sets of ratings may be assigned to variations of another parameter, e.g. climatic categories or stability classes. Then such different sets of ratings should be given in separate tables which need to be clearly assigned to the relevant parameter(s). Such duplicate tables may be titled e.g. as Table 3a, Table 3b, etc. as required.

The permissible dissipation of resistors covered by this detail specification is the rated dissipation as given in Table 3, which is derated for an ambient temperature above the rated temperature 70 °C according to the diagram in Figure 2.

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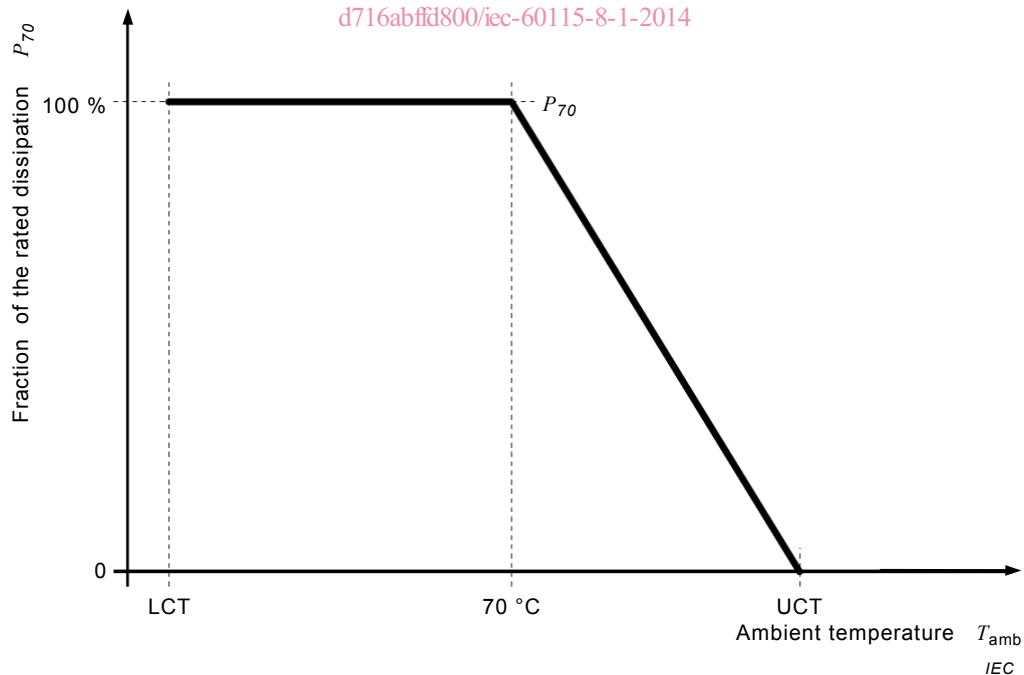


Figure 2 – Derating curve

COMMENT 6 See IEC 60115-8:2009, 1.4.8.

COMMENT 7 The scale of derated dissipation may be given as absolute value in watt or relative in percent as a fraction of the rated dissipation P_{70} .