



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of EN 60115-8-1:2015. It is derived from IEC 60115-8-1:2014.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags **Ⓒ** **Ⓒ**.

The UK participation in its preparation was entrusted to Technical Committee EPL/40X, Capacitors and resistors for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EN 60115-8-1

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English Version

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 (IEC 60115-8-1:2014 , modified)

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 (IEC 60115-8-1:2014 , modifiée)

Festwiderstände zur Verwendung in Geräten der Elektronik - Teil 8-1: Vordruck für Bauartspezifikation - Oberflächenmontierbare (SMD) Schicht-Festwiderstände niedriger Belastbarkeit für Geräte der Elektronik, Klassifikationsstufe G (IEC 60115-8-1:2014 , modifiziert)

This European Standard was approved by CENELEC on 2015-03-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 40/2297/FDIS, future edition 2 of IEC 60115-8-1, prepared by IEC/TC 40 "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60115-8-1:2015.

A draft amendment, which covers common modifications to IEC 60115-8-1 (40/2297/FDIS), was prepared by CLC/TC 40XB "Resistors" and approved by CENELEC.

The following dates are fixed:

- latest date by which this document has to be implemented (dop) 2016-03-30
at national level by publication of an identical
national standard or by endorsement
- latest date by which the national standards conflicting with (dow) 2018-03-30
this document have to be withdrawn

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60115-8-1:2014 are prefixed "Z".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60115-8-1:2014 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60062	2004	Marking codes for resistors and capacitors	EN 60062 + corrigendum Jan. 2007	2005 2007
IEC 60063	-	Preferred number series for resistors and capacitors	EN 60063	-
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60115-1 (mod)	2008	Fixed resistors for use in electronic equipment -	EN 60115-1	2011
-	-	Part 1: Generic specification	+ A11	2015
IEC 60115-8 (mod)	2009	Fixed resistors for use in electronic equipment - Part 8: Sectional specification - Fixed surface mount resistors	EN 60115-8	2012
IEC 60286-3	-	Packaging of components for automatic handling - Part 3: Packaging of surface mount components on continuous tapes	EN 60286-3	-
IEC 60286-6	-	Packaging of components for automatic handling - Part 3: Bulk case packaging for surface mount components	EN 60286-6	-
IEC 61193-2	2007	Quality assessment systems - Part 2: Selection and use of sampling plans for inspection of electronic components and packages	EN 61193-2	2007
IEC 61760-1	-	Surface mounting technology - Part 1: Standard method for the specification of surface mounting components (SMDs)	EN 61760-1	-

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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

- 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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.

NOTE The readers of this European Standard are advised of the corresponding European documents listed in the normative Annex ZA, which take precedence over the International Standards listed in this clause. The precedence also applies to all informative and normative references made within this document.

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 or to level R.

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 CENELEC 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] "[C]CENELEC [C]" 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 [C] CENELEC [C] 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: IEC 60115-8: IEC 60115-8-1:	[3]	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 Stability classes ...	[7]
			[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 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.

NOTE The readers of this European Standard are advised of the corresponding European documents listed in the normative Annex ZA, which take precedence over the International Standards listed in this clause. The precedence also applies to all normative references made within this document.

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

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.

3.1

nominal resistance

R_n

resistance value for which the resistor has been designed, and which is generally used for denomination of the resistor

Note 1 to entry: The definition of nominal resistance, R_n , is identical to the definition of rated resistance, R_r , in EN 60115-1:2011. Therefore nominal resistance, R_n , may be applied wherever rated resistance, R_r , is required, e.g. in a quality assessment scheme.

COMMENT Any further terms and definitions may be added, if required by the drafted detail specification. 

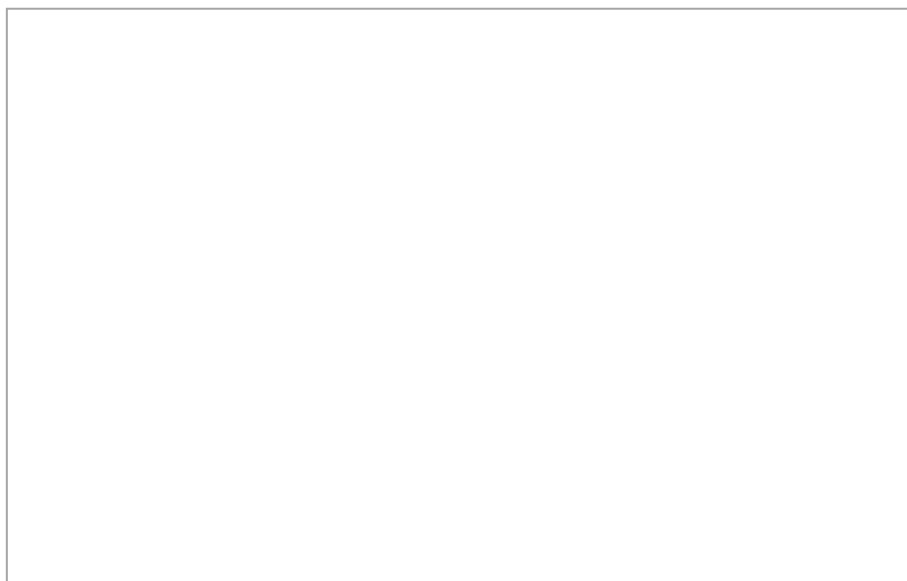
4 Characteristics and ratings

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.



IEC

Figure 1 – Outline and dimensions

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