

STN	Nepremenné rezistory na používanie v elektronických zariadeniach. Časť 8-1: Vzorová predmetová špecifikácia: Nepremenné vrstvomé rezistory na povrchovú montáž (SMD) na malú záťaž pre všeobecné elektronické zariadenia, klasifikačná úroveň G.	STN EN 60115-8-1 35 8190
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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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/15

Obsahuje: EN 60115-8-1:2015, IEC 60115-8-1:2014

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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 (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)

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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".

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

1 Modification to the Introduction

After the comment, **add** the following note:

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.

2 Modification to 0.1

At the end of the 2nd paragraph, **replace** “to level P.” by “to level P or to level R.”.

3 Modification to 0.2

At the end of the 1st paragraph, **replace** “IEC specifications” by “CENELEC specifications”.

4 Modifications to 0.3

In list item [1], **replace** “International Electrotechnical Commission” by “CENELEC”.

In list item [2], **replace** “IEC” by “CENELEC”.

5 Modification to Clause 2

After the 1st paragraph, **add** the following note:

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.

6 Modification to Clause 3

After the 1st paragraph, **add** the following entry and note to entry:

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.

Replace the comment by

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

7 Modification to 4.3

Replace the 2nd paragraph by

The upper category temperature (UCT), which is used for test procedures, shall be the same as the maximum element temperature (MET).

8 Modification to 5.13

Replace the entry for the solvent temperature by

$$\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$$

9 Modification to 5.14

Replace the entry for solvent temperature by

$$\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$$

10 Modification to 6.4

Replace the explanation for MET by

MET is the maximum element temperature, MET = UCT.

11 Modifications to Table 12

In Group 11, Test 4.29, **replace** " $T_{\text{bath}} = (23 \pm 5) \text{ } ^\circ\text{C}$ " by " $\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$ "

In Group 11, Test 4.30,

replace " $T_{\text{bath}} = (23 \pm 5) \text{ } ^\circ\text{C}$ " by " $\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$ "

replace "cotton wool" by "..."

12 Modifications to Table 13

In Group E, Test 4.29, **replace** " $T_{\text{bath}} = (23 \pm 5) \text{ } ^\circ\text{C}$ " by " $\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$ "

In Group E, Test 4.30:

replace " $T_{\text{bath}} = (23 \pm 5) \text{ } ^\circ\text{C}$ " by " $\vartheta_{\text{bath}} = (50_{-5}^0) \text{ } ^\circ\text{C}$ "

replace "cotton wool" by "..."

13 Modifications to B.1

In the list of letter symbol explanations, **add** the new entry after the entry for R_n :

R_r	Rated resistance, $R_r = R_n$	Ω
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In the list of letter symbol explanations, **replace** the respective entries for temperature by

ϑ	Temperature, e.g. as an atmospheric condition for testing (also written as T)	$^{\circ}\text{C}$
ϑ_A	Low temperature of a change of temperature test (also written as T_A)	$^{\circ}\text{C}$
ϑ_B	High temperature of a change of temperature test (also written as T_B)	$^{\circ}\text{C}$
ϑ_{amb}	Ambient temperature (also written as T_{amb})	$^{\circ}\text{C}$
ϑ_{bath}	Bath temperature, e.g. in solvent resistance or solder bath tests (also written as T_{bath})	$^{\circ}\text{C}$
ϑ_{max}	Maximum temperature, maximum element temperature (also written as T_{max})	$^{\circ}\text{C}$
$\Delta\vartheta$	Temperature rise (also written as ΔT)	K
$\Delta\vartheta_{\text{max}}$	Maximum permissible temperature rise (also written as ΔT_{max})	K

14 Modifications to Annex X

Delete Annex X "Cross-reference for references to the prior revision of this specification".

Add the following Annex ZA on correspondences for normative references.

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	-

Replace the Bibliography by the following Bibliography providing references to European Standards.

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.

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

EN 60060-1, *High-voltage test techniques - Part 1: General definitions and test requirements* (IEC 60060-1)

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

EN 60068-2-1:1993 ¹⁾, *Environmental testing - Part 2: Tests - Tests A: Cold* (IEC 60068-2-1:1990)

EN 60068-2-2:1993 ²⁾, *Basic environmental testing procedures - Part 2: Tests - Tests B: Dry heat* (IEC 60068-2-2:1974 + IEC 60068-2-2A:1976)

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

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

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

EN 60068-2-20, *Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads* (IEC 60068-2-20)

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

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

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

EN 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 60068-2-58)

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

EN 60195 ³⁾, *Method of measurement of current noise generated in fixed resistors* (IEC 60195 ⁴⁾)

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

1) Replaced by EN 60068-2-1:2007 (IEC 60068-2-1:2007, sixth edition).

2) Replaced by EN 60068-2-2:2007 (IEC 60068-2-2:2007, fifth edition).

3) At draft stage.

EN 60617, *Graphical symbols for diagrams* (IEC 60617)

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

EN 61340-3-1, *Electrostatics - Part 3-1: Methods for simulation of electrostatic effects - Human body model (HBM) electrostatic discharge test waveforms* (IEC 61340-3-1)

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

EN 80000 (series), *Quantities and units* (IEC 80000, series)

EN ISO 80000 (series), *Quantities and units* (ISO 80000, series)



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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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Part 8-1: Blank detail specification: Fixed surface mount (SMD) low power film
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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 ...
	[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.

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.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN