



# SLOVENSKI STANDARD

## SIST EN 140101:2008

01-junij-2008

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SIST EN 140101:2002

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Blank Detail Specification: Fixed low power film resistors

Vordruck für die Bauartspezifikation: Schicht-Festwiderstände niedriger Belastbarkeit

**iTeh STANDARD PREVIEW**  
Spécification particulière: Résistances fixes à couche et à faible dissipation  
(standards.iteh.ai)

**Ta slovenski standard je istoveten z ~~SIST EN 140101~~ EN 140101:2008**

<https://standards.iteh.ai/catalog/standards/sist/51784f2c-00b0-4140-a692-e12514ef7bec/sist-en-140101-2008>

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**ICS:**

31.040.10      Fiksni upor                                      Fixed resistors

**SIST EN 140101:2008**                                      **en,fr,de**

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English version

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This European Standard was approved by CENELEC on 2007-11-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 40XB, Resistors.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 140101 on 2007-11-01.

This European Standard supersedes EN 140101:1996.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2008-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-11-01

Preceding documents on the subject covered by this specification have been:

- CECC 40 101:1981.

Compared to the superseded standard, the following changes have been implemented:

- modification of the title;
- introduction of a test on the resistance to electrostatic discharge (ESD) in 1.6 and in Annex A;
- introduction of description and test methods for lead-free soldering in 1.9.3 and in Annex A;
- introduction of code letters for the temperature coefficient (TCR) as in EN 60062;
- revision of ordering information in 1.8.4;
- adoption of the IECQ rules of procedure, IEC QC 001002-3;
- revision of the sample quantities and the sequence of tests in Annex A;
- editorial revision.

This specification supports the building of a series of documents describing fixed low power film resistors as follows:

- EN 60115-1 Fixed resistors for use in electronic equipment – Part 1: Generic specification (IEC 60115-1, mod.)
  - EN 140100 Sectional specification: Fixed low power film resistors
  - EN 140101-xxx Relevant detail specification(s) written on the basis of this Blank Detail Specification.
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## Introduction

### Blank Detail Specification

A Blank Detail Specification is a supplementary document to the sectional specification and contains requirements for style and layout and minimum content of detail specifications. Detail specifications not complying with these requirements shall not be considered as being in accordance with European standards nor shall they be so described.

In the preparation of the detail specification the content of EN 140100:2008, 1.2 shall be taken into account.

The detail specification should be written by using the preferred values given in EN 140100.

The detail specification should contain a table of contents prior the first page of the actual specification. For the use of SI units refer to ISO 1000, for the use of letter symbols to be used in electrical technology refer to EN 60027-1.

Notes in this document shall be considered as guidance and are not part of the detail specification itself.


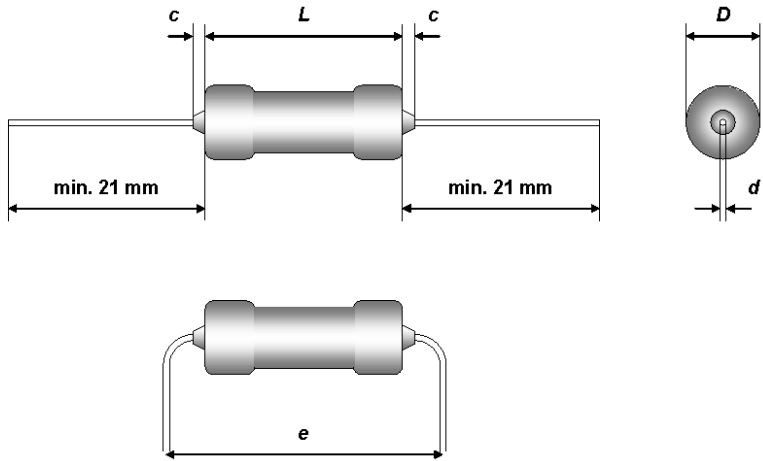
### Identification of the detail specification and the component

The first page of the detail specification should have the layout recommended on page 5.

The numbers in square brackets correspond to the indications to be completed thereunder:

- [1] the name of the National Standards Organisation under whose authority the detail specification is published, and if applicable, the organisation from whom the detail specification is available;
- [2] the CECC symbol and the number allocated to the detail specification by the CENELEC General Secretariat;  
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- [3] the number and issue number of the EN generic and sectional specification as relevant; also national reference if different;
- [4] the national number of the detail specification, date of issue and any further information required by the national system, together with any amendment numbers, if different from the EN number;
- [5] a brief description of the component or range of components;
- [6] information on typical construction (where applicable);
- [7] an outline drawing with the main dimensions which are of importance for interchangeability and/or reference to the appropriate national or international document for outlines. Alternatively, this drawing may be given in an annex to the detail specification;
- [8] the level of quality assessment covered by the detail specification.

For [5] and [6] the text to be given in the detail specification should be suitable for an entry in a register of approvals and the “CENELEC Catalogue of European Standards”.

Specification available from: [1] CENELEC Central Secretariat, Rue de Stassart 35 B-1050 Brussels, or from the addresses shown on the inside cover	<b>EN 140101</b> [2] 
Electronic components of assessed quality in accordance with: [3] EN 60115-1:2001 + A1:2001 EN 140100:2008	<b>Issue 2</b> [4] March 2008
 <p>Other shapes are permitted within the given dimensions.  <b>Figure 1 – Outline and dimensions (see Table 1)</b></p>	Fixed low power film resistors [5] (Description of the component) [6] Assessment level EZ <sup>a</sup> [8] Version A: with 100 %-test Version E: with failure rate level and 100 %-test Stability classes ...
<p><sup>a</sup> For explanation on assessment level EZ see 2.1.1.                  NOTE Version E is optional.</p>	

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## 1 Characteristics and ratings

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

### 1.1 Dimensions and ratings

Table 1 – Style and dimensions

Style	Length <i>L</i> mm		Diameter <i>D</i> mm		<i>d</i> <sup>a</sup> mm	<i>e</i> <sup>b</sup> mm	<i>c</i> <sup>c</sup> mm	Mass <sup>d</sup> mg
	Code	min.	max.	min.				

<sup>a</sup> Permissible tolerance according to HD 349.  
<sup>b</sup> Standard distance for the axis to bent leads. Smaller modules may be agreed between manufacturer and customer.  
<sup>c</sup> Length of excess protective coating.  
<sup>d</sup> For information only.  
<sup>x</sup> Optional column for additional information (e.g. size code).  
 NOTE See EN 140100:2008, 1.2 b).

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

**Table 2a – Ratings**

Style	x	Rated dissipation $P_{70}$ mW	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	
				1 min	continuous
x Optional column for additional information (e.g. stability class, rated dissipation at other ambient temperature than 70 °C) NOTE 1 See EN 140100:2008, 1.2 h), i), j). NOTE 2 Should it be necessary to control further parameters, a more detailed specification should be used. Then the additional test method(s) shall be fully described and appropriate limits and inspection levels (IL) shall be specified.					

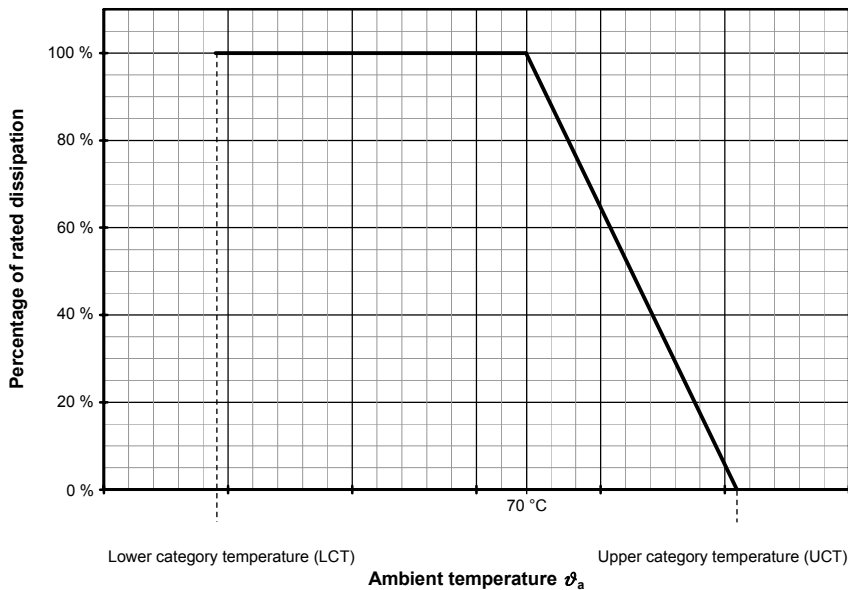
**Table 2b – Ratings for 0 Ω resistors**

Style	Maximum current $I_{max}$ A	Maximum resistance $R_{r max}$ mΩ	Insulation voltage d.c. or a.c. (peak) $U_{ins}$ V	
			1 min	continuous
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NOTE Table 2b is optional.				

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**1.2 Derating curve** <https://standards.iteh.ai/catalog/standards/sist/51784f2c-00b0-4140-a692-e12514cf7bca/sist-en-140101-2008>

Resistors covered by this specification are derated according to the following diagram:



**Figure 2 – Derating curve**

NOTE 1 See EN 140100:2008, 1.2 h).

NOTE 2 A larger area of operation may be given in the detail specification, provided it includes all the area given above.



### 1.3 Resistance range and tolerance on rated resistance

#### 1.3.1 Version A

The following combinations of temperature coefficient and tolerance on rated resistance may be approved only. Products from this extent shall be used for the Qualification approval according to 2.2.1 and for the Quality conformance inspection according to 2.3. Resistance values of an E-series according to IEC 60063 shall be used.

The qualification of resistance values below or beyond the specified resistance values is permitted, if they fulfil the requirements of the closest stability class (e.g. Style ... shall fulfil the requirements of stability class ...).

**Table 3a – Resistance range and tolerance on rated resistance for Version A**

Style	Tolerance on rated resistance		Temperature coefficient 10 <sup>-6</sup> /K	Resistance range	Stability class <sup>b</sup>
	%	Code <sup>a</sup>			
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0 Ω resistors according to Table 2b for styles ...					
<sup>a</sup> Code letters according to EN 60062. <sup>b</sup> For the category temperatures of stability classes refer to Table 6.					

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#### 1.3.2 Version E

The following combinations of temperature coefficient, tolerance on rated resistance, resistance range and E-series according to IEC 60063 are permitted only. Products from this extent shall be used for the Qualification approval according to 2.2.2 and for the Quality conformance inspection according to 2.3 and are permitted only:

**Table 3b – Resistance range and tolerance on rated resistance for Version E**

Style	Tolerance on rated resistance		Temperature coefficient 10 <sup>-6</sup> /K	Resistance range	Stability class <sup>b</sup>	E series
	%	Code <sup>a</sup>				
0 Ω resistors according to Table 2b for styles ...						
<sup>a</sup> Code letters according to EN 60062. <sup>b</sup> For the category temperatures of stability classes refer to Table 6.						
NOTE Table 3b is only required for Version E and should be a subset of Table 3a.						

**1.4 Variation of resistance with temperature and temperature rise**

**Table 4 – Temperature coefficients and percentage change of resistance**

Temperature coefficient			Limit of resistance change $\Delta R/R$ %				
$10^{-6}/K$	Code <sup>a</sup>	Code <sup>b</sup>	LCT / Reference temp. °C		Reference temperature / UCT °C		
			-... / 20	-... / 20	20 / ...	20 / ...	20 / ...

<sup>a</sup> Code letters according to EN 60062.  
<sup>b</sup> Historical code letters according to ..., for information only.

NOTE 1 Second code column with historical reference is optional.  
 NOTE 2 See EN 140100:2008, 1.2 g).

**Table 5 – Limit of temperature rise**

Stability class	Limit of temperature rise at rated dissipation
	$T_r \leq \dots$
	$T_r \leq \dots$

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**1.5 Climatic categories**

NOTE See EN 140100:2008, 1.2 c).

**Table 6 – Climatic categories**

Stability class	Climatic category LCT / UCT / Duration
	... / ... / ...
	... / ... / ...

### 1.6 Limits for change of resistance at tests

NOTE See EN 140100:2008, 1.2 d).

**Table 7a – Limits for change of resistance at tests**

Stability class	Limit of resistance change $\Delta R/R$		
	EN 60115-1 <sup>a</sup> , 4.23 Climatic sequence 4.24 Damp heat, steady state 4.25.3 Endurance at upper category temperature	EN 60115-1 <sup>a</sup> , 4.25.1 Endurance at 70 °C  1 000 h	EN 60115-1 <sup>a</sup> , 4.13 Overload 4.16 Robustness of terminations 4.18 Resistance to soldering heat 4.19 Rapid change of temperature, 5 cycles 4.22 Vibration Extended, 8 000 h

<sup>a</sup> EN 60115-1:2001 + A1:2001.

**Table 7b – Limits for change of resistance at tests**

Stability class	Limit of resistance change $\Delta R/R$			
	EN 60115-1 <sup>a</sup> , 4.19 Rapid change of temperature, $\geq 100$ cycles	EN 60115-1 <sup>a</sup> , 4.27 Single pulse high voltage overload test	EN 60115-1 <sup>a</sup> , 4.27 Periodic electric overload	EN 60115-1 <sup>a</sup> , 4.40 Electrostatic discharge <sup>b</sup>

<sup>a</sup> EN 60115-1:2001 + A1:2001.  
<sup>b</sup> Human body model (HBM) according to EN 61340-3-1, 3 positive + 3 negative discharges.

### 1.7 Non-linear properties

If for resistors in the range  $10 \Omega \leq R \leq \dots$  measurement of non-linearity is required according to 2.1.2, the measured values shall be above the limits given in the diagram below. The resistors shall be tested according to IEC/TR 60440 where the test voltage shall be the rated voltage.