SLOVENSKI STANDARD
SIST EN 140401:2003

01-oktober-2003

Blank Detail Specification: Fixed low power non wire-wound surface mount (SMD) resistors

Blank Detail Specification: Fixed low power non wire-wound surface mount (SMD) resistors

Vordruck für Bauartspezifikation: Oberflächenmontierbare nichtdrahtgewickelte Festwiderstände (SMD) niedriger Belastbarkeit

Specification particulière cadre: Résistances fixes non bobinées à faible dissipation pour montage en surface (CMS)

Ta slovenski standard je istoveten z: **EN 140401:2002**

ICS:

31.040.10	Fiksni upor	Fixed resistors

SIST EN 140401:2003 **en**

EUROPEAN STANDARD **EN 140401**

NORME EUROPÉENNE

EUROPÄISCHE NORM May 2002

ICS 31.040.10 Supersedes EN 140401:1996

English version

Blank Detail Specification: Fixed low power non wire-wound surface mount (SMD) resistors

Specification particulière cadre: Résistances fixes non bobinées à faible dissipation pour montage en surface (CMS)

Vordruck für Bauartspezifikation: Oberflächenmontierbare nichtdraht-gewickelte Festwiderstände (SMD) niedriger Belastbarkeit

This European Standard was approved by CENELEC on 2001-12-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and 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

Ref. No. EN 140401:2002 E

Foreword

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

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 140401 on 2001-12-01.

This European Standard supersedes EN 140401:1996.

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) 2003-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-12-01

This specification is part of three documents describing fixed resistors for surface mount technology as follows.

EN 60115-1	Fixed resistors for use in electronic equipment – Part 1: Generic Specification (IEC 60115-1, mod.)
EN 140400	Sectional Specification: Fixed low power surface mount (SMD) resistors
EN 140401	Blank Detail Specification: Fixed low power non wire-wound surface mount (SMD) resistors

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A and C are normative and annex B is informative.

Contents

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 140400, 1.4 shall be taken into account.

The detail specification should be written by using the preferred values given in EN 140400.

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 IEC 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 CECC General Secretariat;

[3] the number and issue number of the CECC 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 CECC number;

[5] a brief description of the component or range of components;

[6] information on typical construction (where applicable).

For [5] and [6] the text to be given in the detail specification should be suitable for an entry in CECC 00 200 (register of approvals) and the “CENELEC Catalogue of European Standards”;

[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.

Specification available from: [1]	**EN 140401-...** [2] (Specification number)
Electronic components of assessed quality in accordance with: [3] EN 60115-1:2001 EN 140400:200X	**Issue ...** [4] (Month) (Year)
[7]	Fixed low power non wire-wound surface [5] mounting resistors Style ...
	(Description of the component) [6]
Other shapes are permitted within the given dimensions. **Figure 1 - Outline and dimensions** (see Table 1)	Assessment level EZ[a] [8] Version A: with 100 %-test Version E: with failure rate level and 100 %-test Stability classes
[a] for explanations on assessment level EZ see 2.1.1.	

NOTE Version E is optional.

1 Characteristics and ratings

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

1.1 Dimensions and ratings

Table 1 – Style and dimensions

Style		Length *L*								
		mm		mm		mm		mm		
Metric	**inch**	**min.**	**max.**	**min.**	**max.**	**min.**	**max.**	**min.**	**max.**	

NOTE See EN 140400, 1.2 a).

Table 2a – Ratings

Style	[a]	**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**
[a] Column for additional information (e.g. stability class, rated dissipation other ambient temperatures than 70 °C).					

NOTE 1 See EN 140400, 1.2 g), h), i).

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, AQLs and Inspection Levels shall be specified.

Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00 200: Register of Approvals

Table 2b – Ratings for 0 Ω-resistors

Style	Maximum current I_{max} A	Maximum resistance value[a] R_{max} mΩ	Insulation voltage d.c. or a.c. (peak) U_{ins} V	
			1 min	continuous

[a] The resistance value shall be measured on the film side.

NOTE 3 Table 2b is optional.

1.2 Derating curve

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

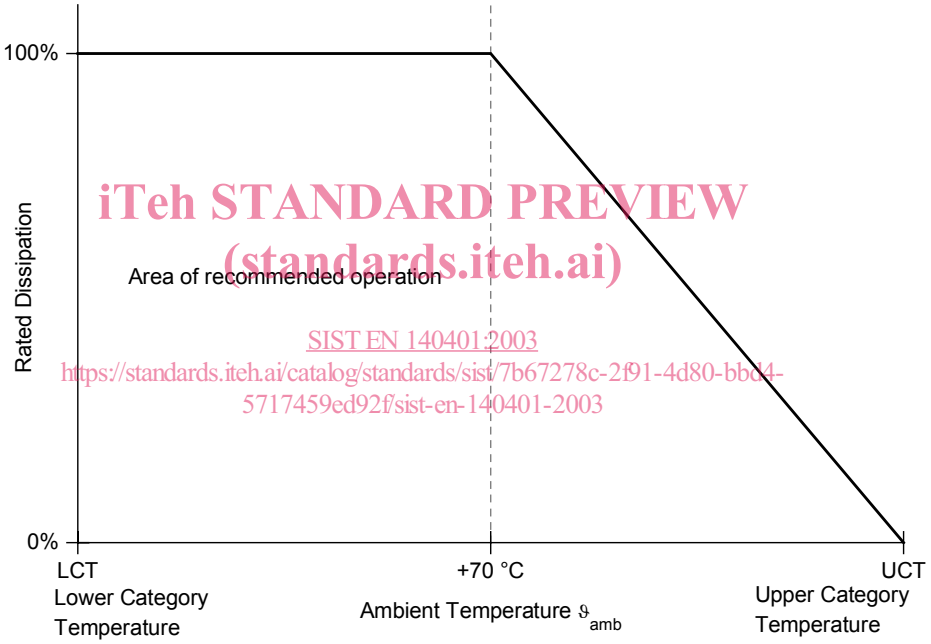

Figure 2 – Derating curve

NOTE 1 See EN 140400, 1.2 g).

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

1.3 Resistance range and tolerance on rated resistance

NOTE 1 See EN 140400, 1.2 d), e), f).

Version A:

The following combinations of temperature coefficient, tolerance on rated resistance shall be used for qualification approval according to 2.2.1 and quality conformance inspection according to 2.3. Resistance values of 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. RR 1608M 1 % >1 MΩ shall fulfil the requirements of stability class 1).

Table 3a – Resistance range, tolerance on rated resistance for version A

Style	Tolerance on rated resistance %	Code[a]	Temperature coefficient ppm/K	Resistance range	Stability class	E series (optional)
0 Ω-resistors according to Table 2b for all styles						
[a] Code letters according to EN 60062.						

Version E:

The following combinations of temperature coefficient, tolerance on rated resistance and E-series according to IEC 60063 shall be used for qualification approval according to 2.2.2 and quality conformance inspection according to 2.3 and are permitted only:

Table 3b – Resistance range, tolerance on rated resistance for version E

Style	Tolerance on rated resistance %	Code[a]	Temperature coefficient ppm/K	Resistance range	Stability class	E series
0 Ω-resistors according to Table 2b for all styles.						
[a] Code letters according to EN 60062.						

NOTE 2 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 (acc. to EN 140400, Table 2)

Temperature coefficient ppm/K	Code[a]	Limit of resistance change $\Delta R/R$ % Temp. charact. 20 °C / 70 °C	Stability classes ... LCT / Ref. temp. ...	Stability classes ... Ref. temp. / UCT ...	Stability classes ... LCT / Ref. temp. ...	Stability classes ... Ref. temp./ UCT ...
[a] Code letter according to EN 140400, Table 2.						

NOTE See EN 140400, 1.2 f).

Table 5 – Limit of temperature rise

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

The thermal resistance is calculated to $R_{th} = T_r / P_{70}$.

1.5 Climatic categories

NOTE See EN 140400, 1.2 b).

Table 6 – Climatic categories

Stability class	Climatic category LCT / UCT / Duration

1.6 Limits for change of resistance at tests

NOTE See EN 140400, 1.2. c).

Table 7 – Limits for change of resistance at tests

Stability class	Limit of resistance change $\Delta R/R$		
	EN 60115-1, **4.23 Climatic sequence** **4.24 Damp heat, steady state** **4.25.3 Endurance at upper category temperature**	**EN 60115-1,** **4.25.1 Endurance at 70 °C**	**EN 60115-1,** **4.13 Overload** **4.18 Resistance to soldering heat** **4.19 Rapid change of temperature** **4.22 Vibration** **4.33 Substrate bending test**
		1 000 h / **Extended, 8 000 h**	

1.7 Non-linear properties

(for resistance values ≥ 10 Ω)

If measurement of non-linearity according to 2.1.1 is required the measured values shall be above the limits given in the diagram below. The resistors shall be tested according to IEC 60440 where the test voltage shall be the rated voltage.

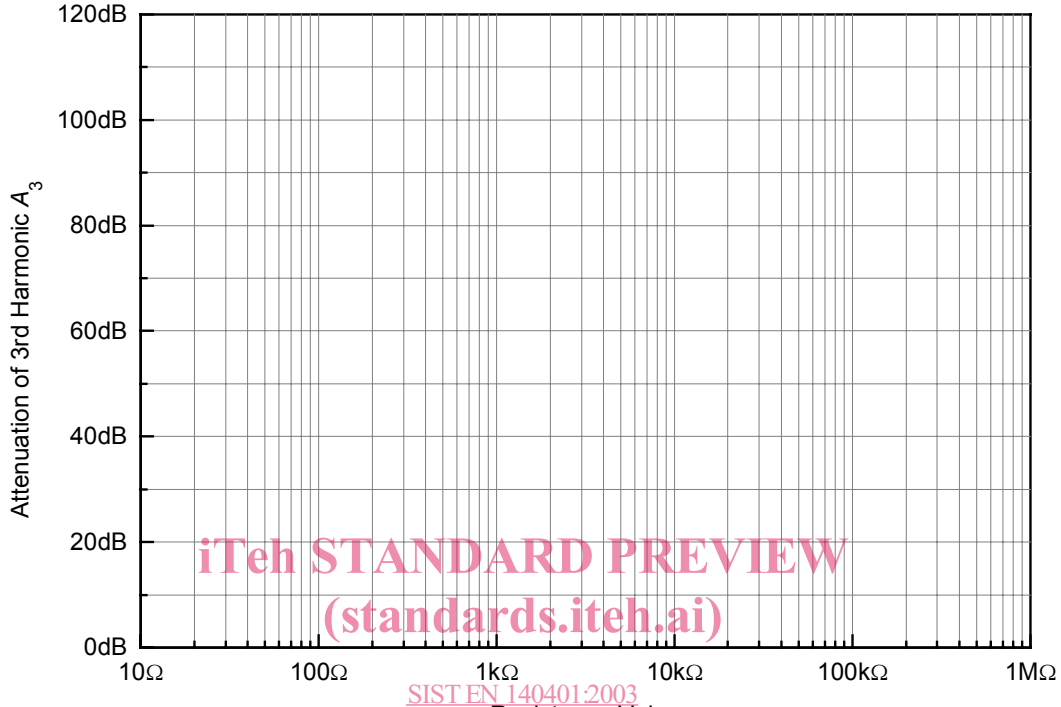

Figure 3 – Limits of non-linearity in resistors

NOTE X-scale shall be in accordance to the resistance range given in Table 3a.

1.8 Marking, packaging and ordering designation

NOTE The marking of components and package shall be in accordance with the requirements of EN 60115-1, 2.4 and EN 140400, 1.2 k), l).

1.8.1 Component

NOTE Marking of the component can be mandatory or not.

1.8.2 Package

The package of the component shall be marked with ordering information in accordance to 1.8.4 with additionally

- CECC sign of conformity,
- CECC manufacturer code,
- NATO manufacturer code (only version E, if required),
- Date code of manufacture according to EN 60062, additional information is allowed.