



SLOVENSKI STANDARD SIST EN 140101-806:2008

01-junij-2008

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d`Uglt`bUj]gc_c_U_cj cglb]`_YfUa]_žn`cV] Ubc`dfYj`Y_c`U]`nU]hžcgb]`U]
dfYXcV`_cj Ub]`nj cX]

Detail Specification: Fixed low power film resistors - Metal film resistors on high grade ceramic, conformal coated or molded, axial or preformed leads

Bauartspezifikation: Schicht-Festwiderstände niedriger Belastbarkeit -
Metallschichtwiderstände auf hochwertiger Keramik, mit konformer Umhüllung und
axialen oder vorgeformten Anschlüssen

Spécification particulière: Résistances fixes à couche et à faible dissipation -
Résistances à couche métallique sur céramique de qualité supérieure, moulée ou
disposant d'un revêtement enrobant, avec des sorties préformées ou axiales

Ta slovenski standard je istoveten z: EN 140101-806:2008

ICS:

31.040.10 Fiksni upor Fixed resistors

SIST EN 140101-806:2008 en,fr,de

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English version

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Fixed low power film resistors -
Metal film resistors on high grade ceramic,
conformal coated or molded, axial or preformed leads**

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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 140101-806 on 2007-11-01.

This European Standard supersedes CECC 40 101-806:1997.

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:

- only on resistors without established reliability, now Version A:
 - CECC 40 101-012: 1978-09; 1981-10; 1983-09; 1992-11
 - CECC 40 101-013: 1978-09; 1981-10; 1983-09; 1992-11
 - CECC 40 101-014: 1978-09; 1981-10
 - CECC 40 101-015: 1981-10; 1983-09; 1992-11
 - CECC 40 101-016: 1978-09; 1981-10; 1983-09; 1992-11
 - CECC 40 101-017: 1978-09; 1981-10; 1983-09; 1992-11
 - CECC 40 101-018: 1981-01; 1983-09; 1992-11
 - CECC 40 101-022: 1977-07
 - CECC 40 101-023: 1977-07
 - CECC 40 101-025: 1977-06
 - CECC 40 101-033: 1981-10; 1983-09
 - CECC 40 101-039: 1982-04; 1986-05
 - CECC 40 101-040: 1982-04; 1984-06
 - CECC 40 101-041: 1984-00
 - CECC 40 101-042: 1984-00
 - CECC 40 101-045: 1985-07; 1987-01; 1992-11; 1995-05
 - CECC 40 101-048: 1992-02; 1992-10
- only on resistors with established reliability, now Version E:
 - CECC 40 101-046: 1987-11
 - CECC 40 101-047: 1988-07; 1989-08; 1990-12; 1993-02; 1995-06

Compared to the superseded standard, the following changes have been implemented:

- modification of the title;
- elimination of style E;
- revised tables for resistance range and tolerance on rated resistance in 1.3;
- introduction of temperature coefficients $\pm 10 \cdot 10^{-6}/K$ and $\pm 5 \cdot 10^{-6}/K$ in 1.4;
- introduction of stability classes 0,25, 0,1 and 0,05 in 1.3 and 1.6;
- introduction of a test on the resistance to electrostatic discharge (ESD) in 1.6 and Annex A;
- introduction of description and test methods for lead-free soldering in 1.9.3 and Annex A;
- introduction of code letters for temperature coefficient (TCR) as in EN 60062;
- revision of ordering information in 1.8.4;

- revised information on pulse load capability in 1.9.5;
- revised information on resistance drift in 1.9.6;
- 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 is part 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
- this detail specification.

Any detail specification within this series is written on the basis of

- EN 140101 Blank detail specification: Fixed low power film resistors.


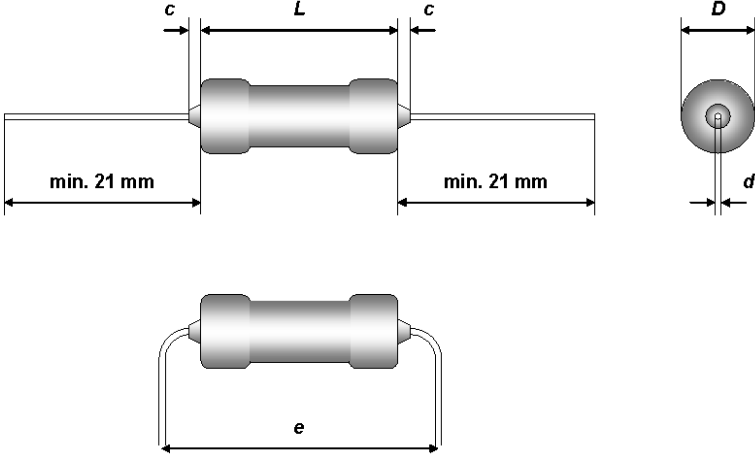
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Specification available from: CENELEC Central Secretariat, Rue de Stassart 35, B-1050 Brussels, or from the addresses shown on the inside cover	EN 140101-806 
Electronic components of assessed quality in accordance with: EN 60115-1:2001 + A1:2001 EN 140100:2008 EN 140101:2008	Issue 2 March 2008
 <p>Other shapes are permitted within the given dimensions. Figure 1 – Outline and dimensions (see Table 1)</p>	Fixed low power film resistors Metal film resistors on high grade ceramic, conformal coated or molded, axial or preformed lead-free leads Assessment level EZ ^a Version A: with 100 %-test Version E: with failure rate level and 100 %-test Stability classes 0,05; 0,1; 0,25; 0,5; 1; 2
^a For explanation on assessment level EZ see 2.1.1.	

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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> ^a mm	<i>e</i> ^b mm	<i>c</i> ^c mm	Mass ^d mg
Code	Size ^d	min.	max.	min.	max.			max.	max.
A	0204	3,0	4,0	1,3	1,9	0,4 / 0,5	7,5	0,5	130
B	0207	5,0	6,5	2,0	2,5	0,6	10,0	0,5	280
C	0411	7,5	10,7	3,0	4,0	0,6 / 0,7	15,0	0,5	600
D	0414	10,0	12,0	3,6	4,1	0,8	17,5	1,0	790

^a Permissible tolerance according to HD 349 S1.

^b Standard distance for the axis to bent leads. Smaller modules may be agreed between manufacturer and customer.

^c Length of excess protective coating.

^d For information only.

The minimum lead length of 21 mm is valid for tape packaging according to EN 60286-1 only (free lead length).

Taping according to EN 60286-1 or preformed leads are permitted. Details to be agreed between manufacturer and customer. For preformed leads the length of excess protective coating may be larger than given in Table 1.

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 for stability classes 2; 1; 0,5

Style	Stability class	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	2; 1; 0,5	400	200	300	75
B	2; 1; 0,5	600	300	500	75
C	2; 1; 0,5	800	500	750	75
D	2; 1; 0,5	900	500	750	75

Table 2b – Ratings for stability class 0,25

Style	Stability class	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	0,25	250	200	300	75
B	0,25	400	300	500	75
C	0,25	500	500	750	75
D	0,25	600	500	750	75

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Table 2c – Ratings for stability class 0,1; 0,05

Style	Stability class	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	0,1; 0,05	75	200	300	75
B	0,1; 0,05	125	300	500	75
C	0,1; 0,05	150	500	750	75
D	0,1; 0,05	175	500	750	75

Table 2d – Ratings for 0 Ω resistors

Style	Maximum current I_{max} A	Maximum resistance R_{max} m Ω	Insulation voltage d.c. or a.c. (peak) U_{ins} V	
			1 min	continuous
A	3	20	300	75
B	5	20	500	75

1.2 Derating curve

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

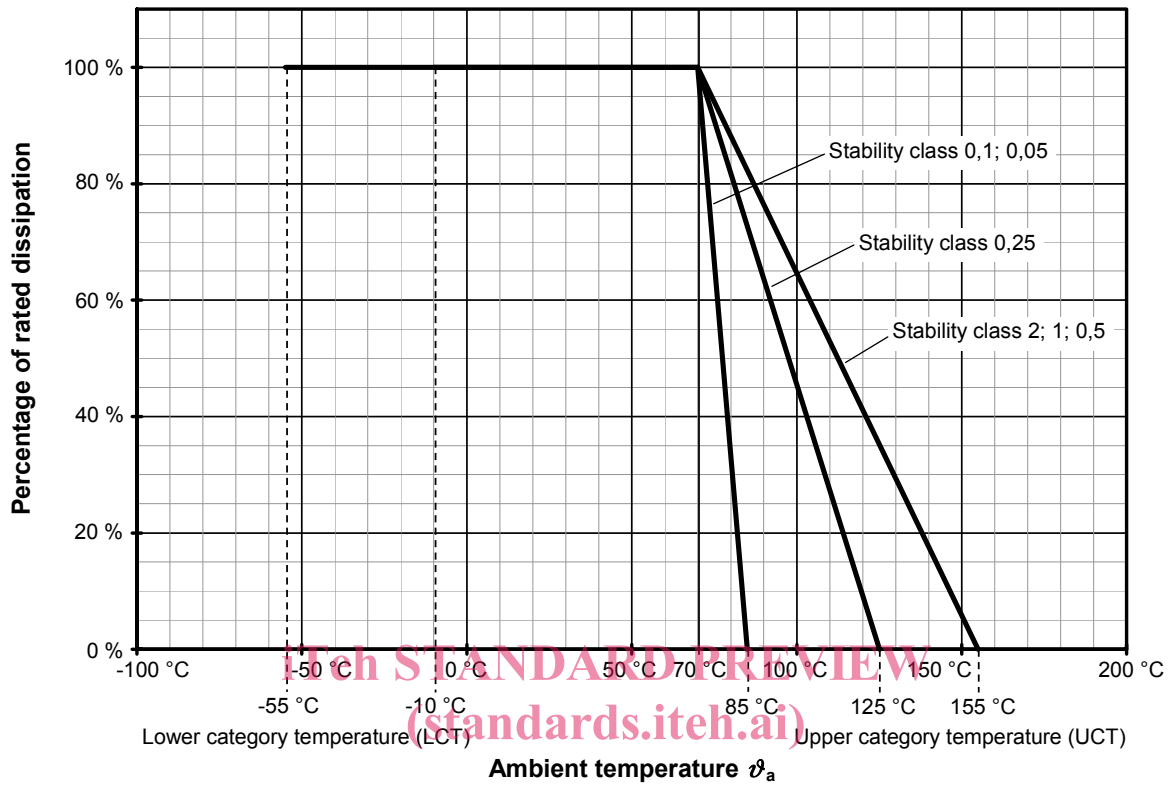


Figure 2 – Derating curve
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Refer to Table 6 for the category temperatures of the stability classes.

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 B 1 % > 10 MΩ shall fulfil the requirements of stability class 2).

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

Style	Tolerance on rated resistance		Temperature coefficient $10^{-6}/K^b$	Resistance range	Stability class ^c
	%	Code ^a			
A	± 5	J	± 50	0,22 Ω to < 1 Ω	1
	± 1	F	± 50	1 Ω to < 10 Ω	0,5
			± 50; ± 25	10 Ω to 332 kΩ	0,5
				10 Ω to 332 kΩ	0,25
				> 332 kΩ to 10 MΩ	2
	± 0,5	D	± 50; ± 25	10 Ω to 332 kΩ	0,25
				10 Ω to 332 kΩ	0,5
	± 0,25	C	± 25; ± 15; ± 10	22 Ω to 332 kΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 100 kΩ	0,05
				> 100 kΩ to 221 kΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	43 Ω to 332 kΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 100 kΩ	0,05
				> 100 kΩ to 221 kΩ	0,1
B	± 5	J	± 50	0,22 Ω to < 1 Ω	1
	± 1	F	± 50	> 10 MΩ to 22 MΩ	2
			± 50; ± 25	1 Ω to < 10 Ω	0,5
				10 Ω to 1 MΩ	0,5
				10 Ω to 1 MΩ	0,25
	± 0,5	D	± 50; ± 25	> 1 MΩ to 10 MΩ	2
				10 Ω to 1 MΩ	0,25
				10 Ω to 1 MΩ	0,5
	± 0,25	C	± 25; ± 15; ± 10	22 Ω to 1 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 270 kΩ	0,05
				> 270 kΩ to 510 kΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	43 Ω to 1 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 270 kΩ	0,05
> 270 kΩ to 510 kΩ				0,1	

Table 3a – Resistance range and tolerance on rated resistance for Version A (continued)

Style	Tolerance on rated resistance		Temperature coefficient $10^{-6}/K^b$	Resistance range	Stability class ^b
	%	Code ^a			
C	± 5	J	± 50	0,22 Ω to < 1 Ω	1
	± 1	F	± 50	1 Ω to < 10 Ω	0,5
			± 50; ± 25	10 Ω to 2,43 MΩ	0,5
				10 Ω to 2,43 MΩ	0,25
				> 2,43 MΩ to 22 MΩ	2
	± 0,5	D	± 50; ± 25	10 Ω to 2,43 MΩ	0,25
				10 Ω to 2,43 MΩ	0,5
	± 0,25	C	± 25; ± 15; ± 10	22 Ω to 1,5 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 470 kΩ	0,05
				> 470 kΩ to 1 MΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	43 Ω to 1,5 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 470 kΩ	0,05
> 470 kΩ to 1 MΩ				0,1	
D	± 5	J	± 50	0,22 Ω to < 1 Ω	1
	± 1	F	± 50	1 Ω to < 10 Ω	0,5
			± 50; ± 25	10 Ω to 2,43 MΩ	0,5
				10 Ω to 2,43 MΩ	0,25
				> 2,43 MΩ to 22 MΩ	2
	± 0,5	D	± 50; ± 25	10 Ω to 2,43 MΩ	0,25
				10 Ω to 2,43 MΩ	0,5
	± 0,25	C	± 25; ± 15; ± 10	22 Ω to 1,5 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 470 kΩ	0,05
				> 470 kΩ to 1 MΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	43 Ω to 1,5 MΩ	0,25
			± 25; ± 15; ± 10; ± 5	43 Ω to < 100 Ω	0,1
				100 Ω to 470 kΩ	0,05
> 470 kΩ to 1 MΩ				0,1	

0 Ω resistors according to Table 2d for styles A and B.

^a Code letters according to EN 60062.
^b For the category temperatures of stability classes refer to Table 6.

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.

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

Style	Tolerance on rated resistance		Temperature coefficient 10 ⁻⁶ /K	Resistance range	Stability class ^b	E series
	%	Code ^a				
A	± 1	F	± 50	1 Ω to 332 kΩ	0,5	E96
				340 kΩ to 5,11 MΩ	2	
	± 0,5	D	± 25	49,9 Ω to 332 kΩ	0,5	E96
				340 kΩ to 511 kΩ	2	
	± 0,1	B	± 15	100 Ω to 332 kΩ	0,25	E192
B	± 1	F	± 50	1 Ω to 1 MΩ	0,5	E96
				1,02 MΩ to 5,11 MΩ	1	
				5,23 MΩ to 10 MΩ	2	
	± 0,5	D	± 25	10 Ω to 1 MΩ	0,5	E96
				± 0,1	B	
	C	± 1	F	± 50	1 Ω to 2,43 MΩ	0,5
2,49 MΩ to 5,11 MΩ					1	
5,23 kΩ to 10 MΩ					2	
± 0,5		D	± 25	10 Ω to 1 MΩ	0,5	E96
				± 0,1	B	
D		± 1	F	± 50	1 Ω to 2,43 MΩ	0,5
	2,49 MΩ to 5,11 MΩ				1	
	5,23 MΩ to 21,5 MΩ				2	
	± 0,5	D	± 25	10 Ω to 1,5 MΩ	0,5	E96
				± 0,1	B	

0 Ω resistors according to Table 2d for styles A and B.

^a Code letters according to EN 60062.

^b For the category temperatures of stability classes refer to Table 6.