



SLOVENSKI STANDARD
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Detail specification: Fixed low power film SMD resistors - Rectangular - Stability classes 0,1; 0,25; 0,5; 1

Bauartspezifikation: SMD Schicht-Festwiderstände niedriger Belastbarkeit - Rechteckig - Stabilitätsklassen 0,1; 0,25; 0,5; 1
(standards.iteh.ai)

Spécification particulière: Résistances couche fixes a faible dissipation CMS - Rectangulaires - Catégories de stabilité 0,1; 0,25; 0,5; 1
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Ta slovenski standard je istoveten z: EN 140401-801:2007

ICS:

31.040.10 Fiksni upor Fixed resistors

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English version

**Detail specification:
Fixed low power film SMD resistors -
Rectangular -
Stability classes 0,1; 0,25; 0,5; 1**

Spécification particulière:
Résistances couche fixes
à faible dissipation CMS -
Rectangulaires -
Catégories de stabilité 0,1; 0,25; 0,5; 1

Bauartspezifikation:
SMD Schicht-Festwiderstände
niedriger Belastbarkeit -
Rechteckig -
Stabilitätsklassen 0,1; 0,25; 0,5; 1

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[SIST EN 140401-801:2008](https://standards.iteh.ai/catalog/standards/sist/en-140401-801-2007-c16c-4b54-8c71-2a406249-801-2008)

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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.

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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 Unique Acceptance Procedure and was approved by CENELEC as EN 140401-801 on 2007-05-01.

This European Standard supersedes EN 140401-801:2002 + A1:2003.

The preceding document on the subject covered by this specification has been CECC 40 401-801:1998.

Compared to the superseded standard, the following changes have been implemented: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 in 1.6 and Annex A;
- introduction of description and test methods for lead-free soldering in 1.8, 1.10.3 and Annex A;
- introduction of the code letters for temperature coefficient as given in EN 60062;
- revision of the ordering information in 1.9.4;
- revised information on pulse load capability in 1.10.6;
- revised information on resistance value drift in 1.10.7;
- revised information on current noise in 1.10.9;
- adoption of the IECQ rules of procedure, QC 001002-3;
- revision of the sample quantities and the sequence of tests in Annex A;
- editorial revision.

[SIST EN 140401-801:2008](#)

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) 2008-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-05-01

This specification is part of four 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
EN 140401-801	Detail specification: Fixed low power film SMD resistors - Rectangular - Stability classes 0,1; 0,25; 0,5; 1

Table of contents


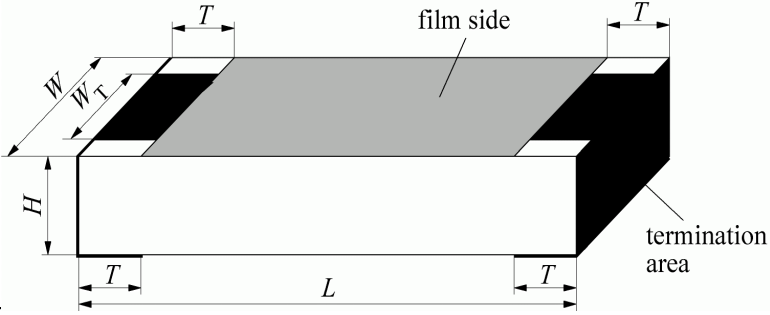
1	Characteristics and ratings.....	4
1.1	Dimensions and ratings.....	4
1.2	Derating curve	6
1.3	Resistance range and tolerance on rated resistance.....	6
1.3.1	Version A.....	6
1.3.2	Version E.....	9
1.4	Variation of resistance with temperature and temperature rise	10
1.5	Climatic categories.....	10
1.6	Limits for change of resistance at tests.....	11
1.7	Non-linear properties.....	12
1.8	Tests related to soldering.....	12
1.8.1	Severities for solderability testing	12
1.8.2	Severities for testing resistance to soldering heat.....	13
1.9	Marking, packaging and ordering designation.....	14
1.9.1	Marking of the component.....	14
1.9.2	Taping	14
1.9.3	Marking of the packaging	14
1.9.4	Ordering information	14
1.10	Additional information (not for inspection purpose)	15
1.10.1	Storage.....	15
1.10.2	Mounting.....	15
1.10.3	Soldering process	15
1.10.4	Conductive gluing	15
1.10.5	Use of cleaning solvents	15
1.10.6	Pulse load capability	15
1.10.7	Variation of resistance value (drift) for operating times up to 200 000 h.....	18
1.10.8	Dissipation notes	20
1.10.9	Current noise	21
1.10.10	Temperature range extension	21
2	Quality assessment procedures	22
2.1	General.....	22
2.1.1	Zero defect approach.....	22
2.1.2	100 %-test	22
2.1.3	0 Ω Resistor	23
2.1.4	Certificate of Conformity (CoC)	23
2.1.5	Certified test records.....	23
2.1.6	Failure rate level	23
2.2	Qualification approval.....	23
2.2.1	Version A.....	23
2.2.2	Version E.....	23
2.3	Quality conformance inspection	23
2.3.1	Qualification approval according to QC 001002-3, Clause 3	24
2.3.2	Technology approval according to QC 001002-3, Clause 6	24
2.3.3	Non-conforming items.....	24
Annex A (normative)	Fixed sample size qualification approval and quality conformance inspection test schedule for fixed low power surface mount (SMD) resistors.....	25
Annex B (informative)	Letter symbols and abbreviations	32
Bibliography.....		34

iTech STANDARD PREVIEW
(standards.itech.ai)

SIST-EN-140401-801:2008

standards.itech.ai/catalog/standards/sist/d4739387-e40e-4b34-8d74-

132-m0012-d01/sist-en-140401-801:2008

Specification available from the National Committees members of CENELEC	EN 140401-801 
Electronic components of assessed quality in accordance with: EN 60115-1:2001 + A1:2001 EN 140400:2003 EN 140401:2002	
 <p>Other shapes are permitted within the given dimensions.</p> <p>Figure 1 - Outline and dimensions (see Table 1)</p>	<p>Fixed low power film chip resistors with rectangular base for surface mounting.</p> <p>Style: RR</p> <p>Ceramic substrate with protected, insulated, resistance film and solder terminations, typically thin film.</p> <p>Assessment level EZ^a</p> <p>Version A: with 100 %-test</p> <p>Version E: with failure rate level and 100 %-test</p> <p>Stability classes 0,1; 0,25; 0,5 and 1</p>
^a For explanations on assessment level EZ see 2.1.1.	

1 Characteristics and ratings (standards.iteh.ai)

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

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1.1 Dimensions and ratings

Table 1 – Style and dimensions

Style		Length <i>L</i> mm		Width <i>W</i> mm		Height <i>H</i> mm		Termination <i>T</i> mm		Mass ^a mg
metric	inch	min.	max.	min.	max.	min.	max.	min.	max.	max.
RR 1005M	RR 0402	0,95	1,10	0,45	0,60	0,25	0,40	0,05 / 0,1 ^b	0,35	0,8
RR 1608M	RR 0603	1,50	1,70	0,75	0,95	0,35	0,55	0,10	0,50	2,1
RR 2012M	RR 0805	1,85	2,15	1,10	1,40	0,35	0,65	0,15	0,60	6,0
RR 3216M	RR 1206	2,90	3,35	1,45	1,75	0,35	0,65	0,25	0,75	10,0
RR 5025M	RR 2010	4,80	5,20	2,30	2,70	0,35	0,75	0,35	0,85	30,0

^a For information only.

^b First figure indicates the termination width on the film side, second figure on the reverse side.

Termination: $W_T \geq 0,75 \cdot W$

Thickness: 0,005 mm to 0,05 mm.

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 1; 0,5; 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
RR 1005M	1; 0,5; 0,25	63	50	75	75
RR 1608M	1; 0,5; 0,25	100	75	100	75
RR 2012M	1; 0,5; 0,25	125	150	200	75
RR 3216M	1; 0,5; 0,25	250	200	300	75
RR 5025M	1; 0,5; 0,25	330	300	300	75

Table 2b – Ratings for stability class 0,1

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
RR 1005M	0,1	16	12,5	75	75
RR 1608M	0,1	32	25	100	75
RR 2012M	0,1	50	35	200	75
RR 3216M	0,1	100	50	300	75
RR 5025M	0,1	150	100	300	75

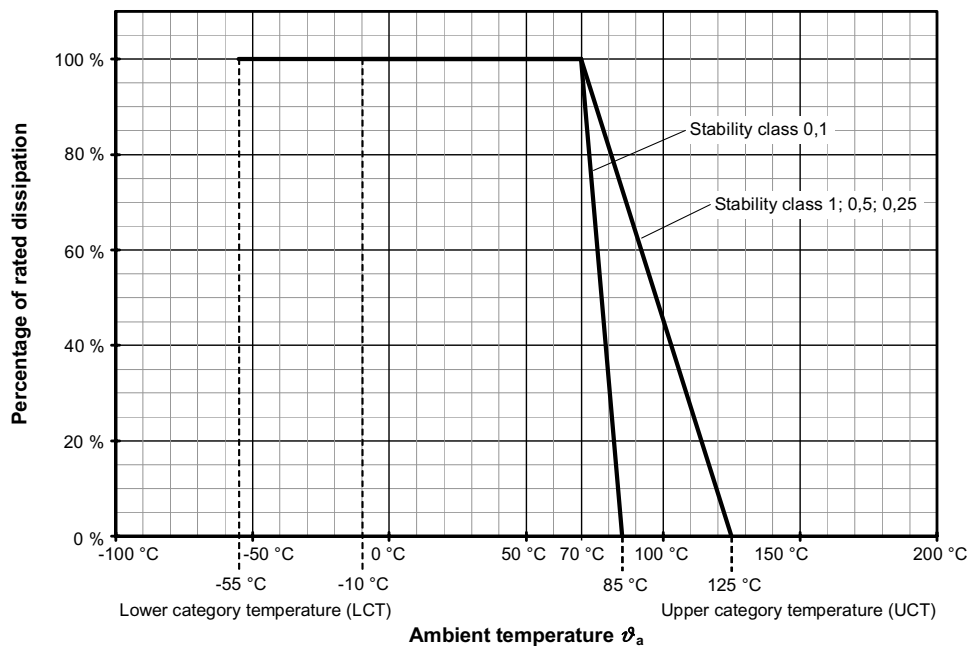
Table 2c – Ratings for 0 Ω resistors

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
RR 1005M	0,63	20	75	75
RR 1608M	1,0	20	100	75
RR 2012M	1,5	20	200	75
RR 3216M	2,0	20	300	75
RR 5025M	3,0	20	300	75

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

1.2 Derating curve

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



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Figure 2 – Derating curve
(standards.iteh.ai)

Refer to Table 6 for the category temperatures of 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. RR 1608M 1% > 1 M Ω shall fulfil the requirements of stability class 1).

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

Style	Tolerance on rated resistance		Temperature coefficient ppm/K	Resistance range	Stability class
	%	Code ^a			
RR 1005M	± 1	F	± 50; ± 25	10 Ω to 33,2 kΩ	0,5
				> 33,2 kΩ to 1 MΩ	1
	± 0,5	D	± 50; ± 25	10 Ω to 33,2 kΩ	0,5
				> 33,2 kΩ to 1 MΩ	1
	± 0,25	C	± 25; ± 15; ± 10	43 Ω to 33,2 kΩ	0,25
				100 Ω to 10 kΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	100 Ω to 33,2 kΩ	0,25
				100 Ω to 10 kΩ	0,1
RR 1608M	± 1	F	± 50; ± 25	1 Ω to < 10 Ω	1
				10 Ω to 100 kΩ	0,5
				> 100 kΩ to 1 MΩ	1
	± 0,5	D	± 50; ± 25	10 Ω to 100 kΩ	0,5
				> 100 kΩ to 1 MΩ	1
	± 0,25	C	± 25; ± 15; ± 10	43 Ω to 100 kΩ	0,25
				100 Ω to 10 kΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	100 Ω to 100 kΩ	0,25
100 Ω to 10 kΩ				0,1	
RR 2012M	± 1	F	± 50; ± 25	1 Ω to < 10 Ω	1
				10 Ω to 221 kΩ	0,5
				> 221 kΩ to 1 MΩ	1
	± 0,5	D	± 50; ± 25	10 Ω to 221 kΩ	0,5
				> 221 kΩ to 1 MΩ	1
	± 0,25	C	± 25; ± 15; ± 10	43 Ω to 221 kΩ	0,25
				100 Ω to 47,5 kΩ	0,1
	± 0,1	B	± 25; ± 15; ± 10	100 Ω to 100 kΩ	0,25
100 Ω to 47,5 kΩ				0,1	

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

Style	Tolerance on rated resistance		Temperature coefficient ppm/K	Resistance range	Stability class	
	%	Code ^a				
RR 3216M	± 1	F	± 50; ± 25	1 Ω to < 10 Ω	1	
				10 Ω to 332 kΩ	0,5	
				> 332 kΩ to 1 MΩ	1	
	± 0,5	D	± 50; ± 25	1 Ω to < 10 Ω	1	
				10 Ω to 332 kΩ	0,5	
				> 332 kΩ to 1 MΩ	1	
	± 0,25	C	± 25; ± 15; ± 10	43 Ω to 332 kΩ	0,25	
				43 Ω to 332 kΩ	0,1	
	± 0,1	B	± 25; ± 15; ± 10	43 Ω to 332 kΩ	0,25	
				43 Ω to 332 kΩ	0,1	
	RR 5025M	± 1	F	± 50; ± 25	1 Ω to < 10 Ω	1
					10 Ω to 332 kΩ	0,5
> 332 kΩ to 3 MΩ					1	
± 0,5		D	± 50; ± 25	1 Ω to < 10 Ω	1	
				10 Ω to 332 kΩ	0,5	
				> 332 kΩ to 3 MΩ	1	
± 0,25		C	± 25; ± 15; ± 10	43 Ω to 3 MΩ	0,25	
				43 Ω to 3 MΩ	0,1	
± 0,1		B	± 25; ± 15; ± 10	43 Ω to 3 MΩ	0,25	
				43 Ω to 3 MΩ	0,1	

0 Ω-resistors according to Table 2c for all styles.

^a Code letters according to EN 60062.

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, tolerance on rated resistance for version E

Style	Tolerance on rated resistance		Temperature coefficient ppm/K	Resistance range	Stability class	E series
	%	Code ^a				
RR 1005M	± 1	F	± 50	10 Ω to 33,2 kΩ	0,5	E96
				34 kΩ to 1 MΩ	1	
	± 0,1	B	± 15	100 Ω to 33,2 kΩ	0,25	E192
RR 1608M	± 1	F	± 50	1 Ω to 9,76 Ω	1	E96
				10 Ω to 100 kΩ	0,5	
				102 kΩ to 1 MΩ	1	
	± 0,1	B	± 15	100 Ω to 47,5 kΩ	0,25	E192
RR 2012M	± 1	F	± 50	1 Ω to 9,76 Ω	1	E96
				10 Ω to 221 kΩ	0,5	
				226 kΩ to 1 MΩ	1	
	± 0,1	B	± 15	100 Ω to 100 kΩ	0,25	E192
RR 3116M	± 1	F	± 50	1 Ω to 9,76 Ω	1	E96
				10 Ω to 332 kΩ	0,5	
				340 kΩ to 1 MΩ	1	
	± 0,1	B	± 15	43 Ω to 332 kΩ	0,25	E192
RR 5025M	± 1	F	± 50	1 Ω to 9,76 Ω	1	E96
				10 Ω to 332 kΩ	0,5	
				340 kΩ to 3,01 MΩ	1	
	± 0,1	B	± 15	43,2 Ω to 3,01 MΩ	0,25	E192

0 Ω-resistors according to Table 2c for all styles.

^a Code letters according to EN 60062.

1.4 Variation of resistance with temperature and temperature rise

Table 4 – Temperature coefficients and limits of resistance change

Temperature coefficient			Limit of resistance change $\Delta R/R$			
ppm/K	Code ^a	Code ^b	%			
			LCT / Reference temp.		Reference temp. / UCT	
			°C		°C	
			-55 / 20	-10 / 20	20 / 85	20 / 125
± 50	R	C	± 0,375	± 0,150	± 0,325	± 0,525
± 25	Q	D	± 0,188	± 0,075	± 0,163	± 0,262
± 15	P	E	± 0,113	± 0,045	± 0,098	± 0,158
± 10	N	F	± 0,075	± 0,030	± 0,065	± 0,105

^a Code letters according to EN 60062.

^b Historical code letters according to EN 140400, for information only.

Table 5 – Limit of temperature rise

Stability class	Limit of temperature rise at rated dissipation
1; 0,5; 0,25	$T_r \leq 55$ K
0,1	$T_r \leq 15$ K

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1.5 Climatic categories

Table 6 – Climatic categories

Stability class	Climatic category LCT / UCT / Duration
1; 0,5; 0,25	55 / 125 / 56
0,1	10 / 085 / 56