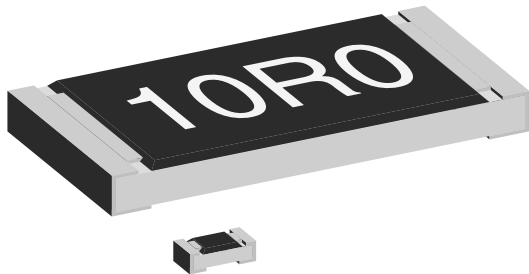


## Lead (Pb)-Free Thick Film, Rectangular Chip Resistors



### FEATURES

- Metal glaze on high quality ceramic
- Protective overglaze
- Lead (Pb)-free solder contacts on Ni barrier layer
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compatible with "Restriction of the use of Hazardous Substances" (RoHS) directive 2002/95/EC (issue 2004)
- Excellent stability in different environmental conditions
- High volume product suitable for commercial and special applications



### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING P <sub>70°C</sub> W	LIMITING ELEMENT VOLTAGE MAX V <sub>≤</sub>	TEMPERATURE COEFFICIENT	TOLERANCE	RESISTANCE RANGE	E-SERIES
	INCH	METRIC	CECC 40401-802/EIA-575		ppm/K	%	Ω	
CRCW0201	0201	0525	0.05	30	± 200	± 1	10R – 1M	24 + 96
			0.05	30	± 200	± 5	10R – 1M0	24
Zero-Ohm-Resistor: R <sub>max</sub> = 50mΩ, I <sub>max</sub> = 1A								
D10/CRCW0402	0402	1005	0.063	50	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 1A						± 5	1R0 – 10M	24
D11/CRCW0603	0603	1608	0.10	75	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 1.5A						± 5	1R0 – 10M	24
D12/CRCW0805	0805	2012	0.125	150	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 2A						± 5	1R0 – 10M	24
D25/CRCW1206	1206	3216	0.25	200	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 2.5A						± 5	1R0 – 10M	24
CRCW1210	1210	3225	0.33	200	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 1M0	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 2.5A						± 5	1R0 – 10M	24
CRCW1218	1218	3246	1.0	200	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 2M2	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 4A						± 5	1R0 – 2M2	24
CRCW2010	2010	5025	0.5	400	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 3A						± 5	1R0 – 10M	24
CRCW2512	2512	6332	1.0	500	± 200 <sup>1)</sup>	± 1	1R0 – 9R76	24 + 96
					± 100	± 1	10R – 10M	24 + 96
Zero-Ohm-Resistor: R <sub>max</sub> = 20mΩ, I <sub>max</sub> = 4A						± 5	1R0 – 10M	24

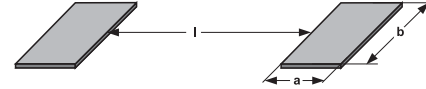
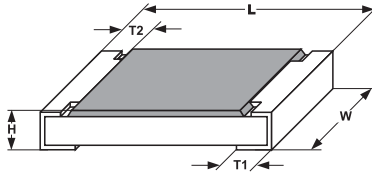
<sup>1)</sup> 100ppm/K on request

- Ask about further value ranges
- For low values see Thick Film rectangular low value resistors
- For high values see Thick Film rectangular high values.
- For precision Thick Film CRCW see Thick Film rectangular Precision Resistors

- Marking and packaging: see appropriate catalog or web pages
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- AgPd or Pd terminations for conductive adhesive attachment on request



## DIMENSIONS



SIZE		DIMENSIONS [in millimeters]				
INCH	METRIC	L	W	H	T1	T2
0201	0525	0.6 ± 0.05	0.3 ± 0.05	0.23 ± 0.05	0.15 ± 0.05	0.6 ± 0.05
0402	1005	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 ± 0.05	0.2 ± 0.1
0603	1608	1.55 <sup>+0.10/-0.05</sup>	0.85 ± 0.1	0.45 ± 0.05	0.3 ± 0.2	0.3 ± 0.2
0805	2012	2.0 <sup>+0.20/-0.10</sup>	1.25 ± 0.15	0.45 ± 0.05	0.3 <sup>+0.20/-0.10</sup>	0.3 ± 0.2
1206	3216	3.2 <sup>+0.10/-0.20</sup>	1.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2
1210	3225	3.2 ± 0.2	2.5 ± 0.2	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2
1218	3246	3.2 <sup>+0.10/-0.20</sup>	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2
2010	5025	5.0 ± 0.15	2.5 ± 0.15	0.6 ± 0.05	0.6 ± 0.2	0.6 ± 0.2
2512	6332	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.05	0.6 ± 0.2	0.6 ± 0.2

SIZE		SOLDER PAD DIMENSIONS [in millimeters]					
		REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC	a	b	l	a	b	l
0201	0525	0.28	0.43	0.23			
0402	1005	0.4	0.6	0.5			
0603	1608	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	0.9	1.7	2.0	1.1	1.7	2.3
1210	3225	0.9	2.5	2.0	1.1	2.5	2.2
1218	3246	1.05	4.9	1.9	1.25	4.8	1.9
2010	5025	1.0	2.5	3.9	1.2	2.5	3.9
2512	6332	1.0	3.2	5.2	1.2	3.2	5.2

## TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRCW0201	D10/ CRCW0402	D11/ CRCW0603	D12/ CRCW0805	D25/ CRCW1206	CRCW1210	CRCW1218	CRCW2010	CRCW2512
Rated Dissipation at 70°C (CECC 40401   EIA 575)	W	0.05	0.063	0.10	0.125	0.25	0.33	1.0	0.5	1.0
Limiting Element Voltage <sup>2)</sup>	V <sub>≅</sub>	30	50	75	150	200	200	200	400	500
Insulation Voltage (1 min)	V <sub>peak</sub>	50	> 75	> 100	> 200	> 300	> 300	> 300	> 300	> 300
Thermal Resistance	K/W		≤ 870 <sup>1)</sup>	≤ 550 <sup>1)</sup>	≤ 440 <sup>1)</sup>	≤ 220 <sup>1)</sup>	≤ 140 <sup>3)</sup>	<sup>3)</sup>	≤ 88 <sup>3)</sup>	≤ 65 <sup>3)</sup>
Insulation Resistance	Ω					> 10 <sup>9</sup>				
Category Temperature Range	°C					- 55 / + 125 (+ 155)				
Failure Rate	h <sup>-1</sup>	1.10 <sup>-9</sup>				0.3 • 10 <sup>-9</sup>				
Weight / 1000pcs	g	0.17	0.65	2	5.5	10	16	29.5	25.5	40.5

<sup>1)</sup> Measuring conditions in acc. to CECC 4040<sup>2)</sup> Rated voltage:  $\sqrt{P \times R}$ <sup>3)</sup> Depending on solder pad dimensions

## PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: CRCW0603562RFKEC

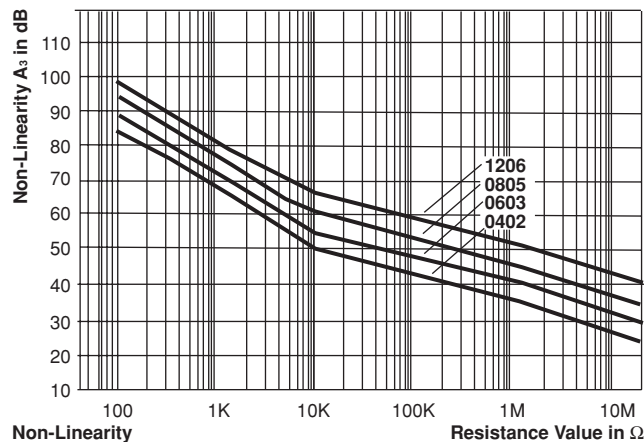
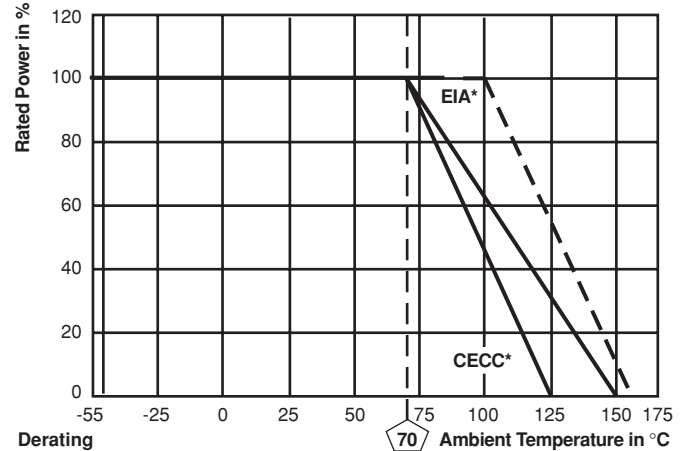
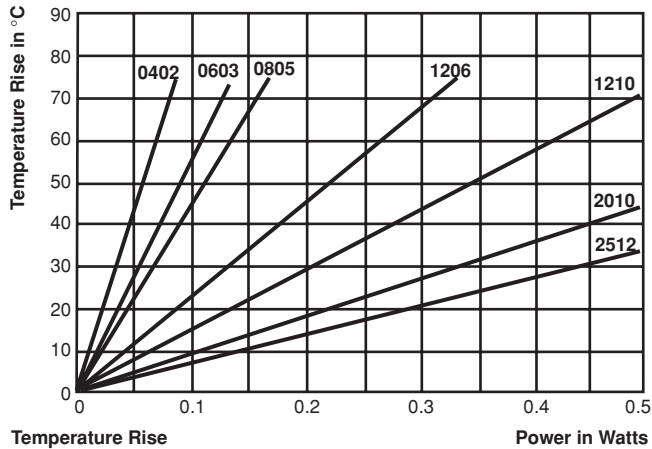
C	R	C	W	0	6	0	3	5	6	2	R	F	K	E	C		
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MODEL	VALUE	TOLERANCE	T.C.	PACKAGING	SPECIAL
CRCW0201 CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW1210 CRCW1218 CRCW2010 CRCW2512	R = Decimal K = Thousand M = Million	F = ± 1.0% J = ± 5.0%	K = ± 100 ppm/K N = ± 200 ppm/K	EA = ET1 5000 paper tape EB = ET5 10000 paper tape EC = ET6 20000 paper tape ED = ET7 10000 paper tape EE = EF4 50000 paper tape EF = E02 4000 paper tape EG = E67 2000 paper tape EH = E82 4000 paper tape EI = EG1 5000 paper tape EK = ET9 4000 paper tape EL = E20 20000 paper tape EY = E27 bulk	up to 2 digits

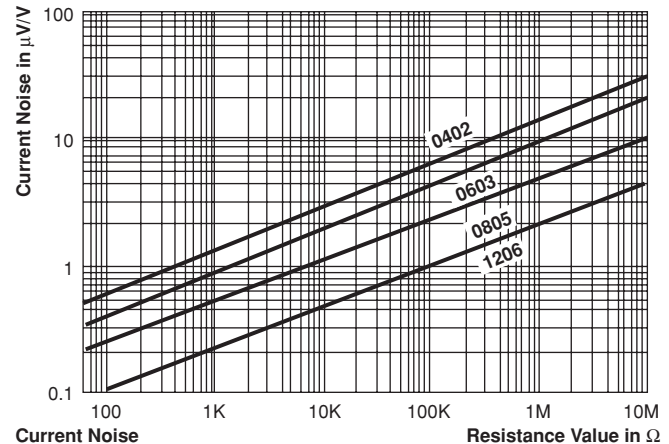
PRODUCT DESCRIPTION: D11/CRCW0603 100 562R 1% ET6 E3

D11/CRCW0603	100	562R	1%	ET6	E3
MODEL CRCW0201 D10/CRCW0402 D11/CRCW0603 D12/CRCW0805 D25/CRCW1206 CRCW1210 CRCW1218 CRCW2010 CRCW2512	TC ± 200 ppm/K ± 100 ppm/K	RESISTANCE VALUE 10R = 10 Ω 562R = 562 Ω 10K = 10.0 KΩ 1M = 1 MΩ	TOLERANCE ± 5% ± 1%	PACKAGING ET1, ET5 ET6, ET7 EF4, E02 E67, E82 EG1, ET9 E20, E27	LEAD FREE E3 = Pure Tin Termination Finish

**NOTE:** Products can be ordered using either the Product Description or the Part Number.

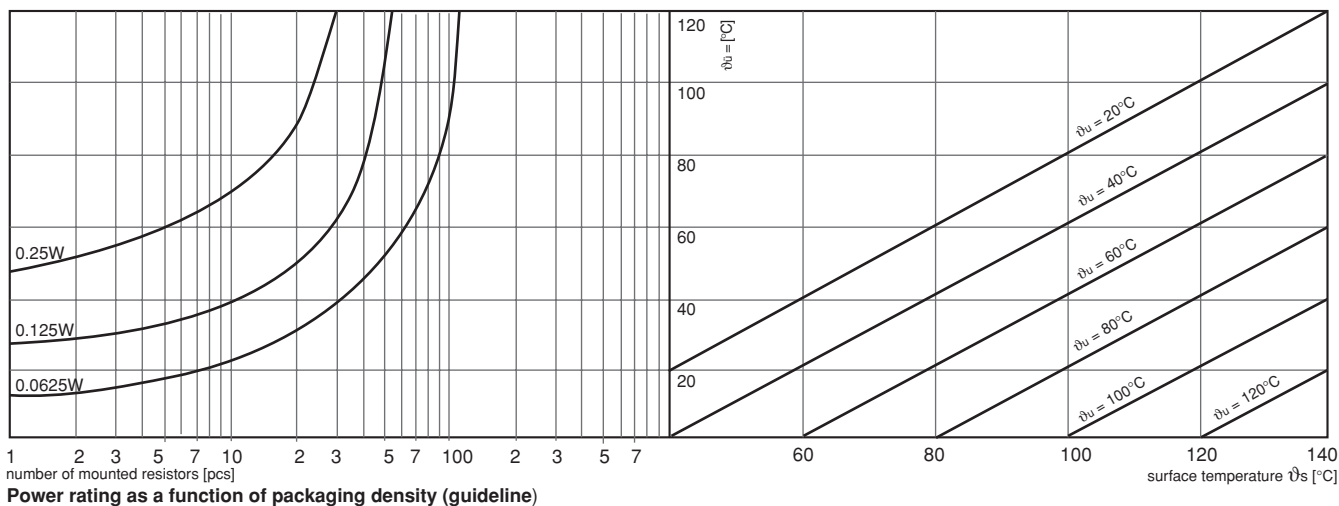
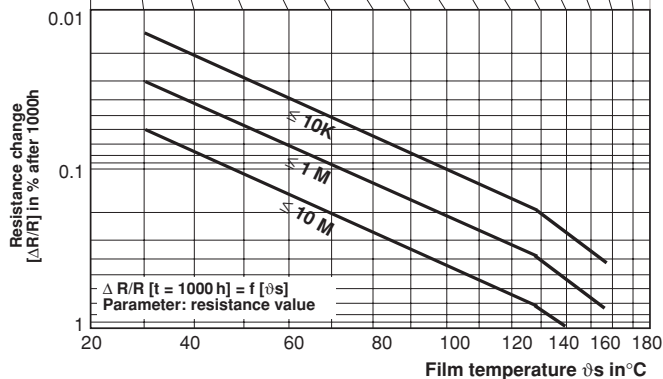
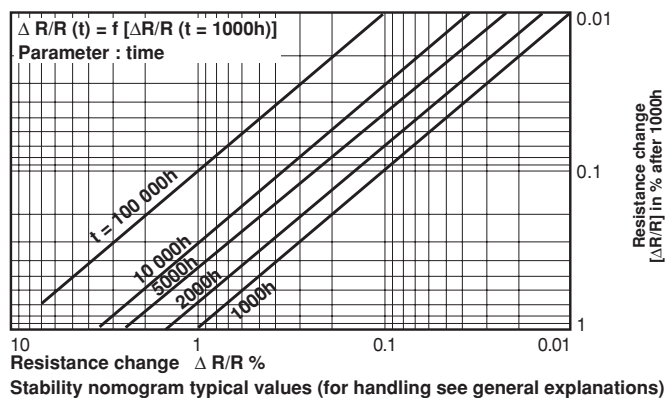
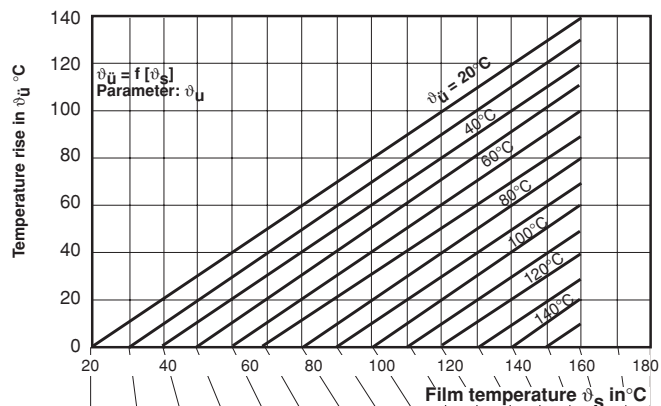
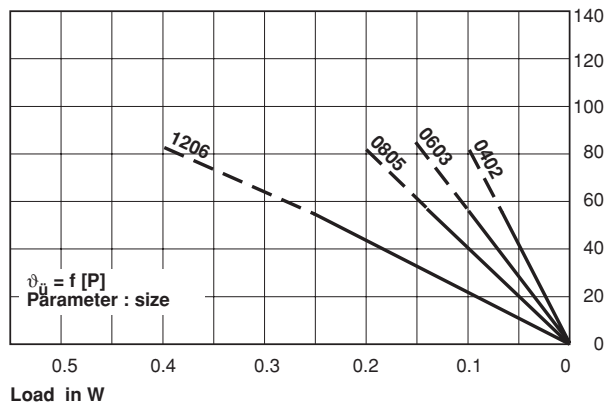


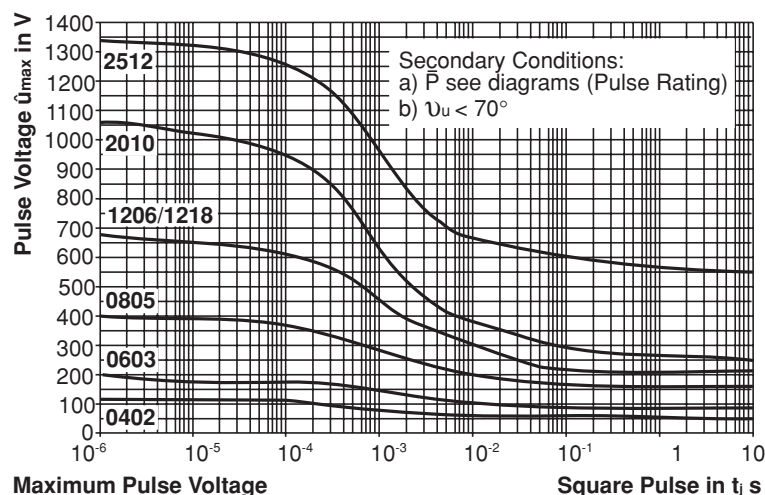
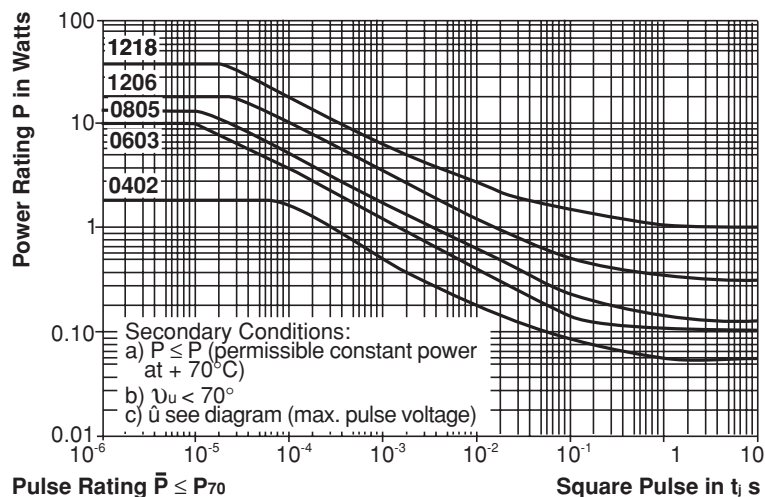
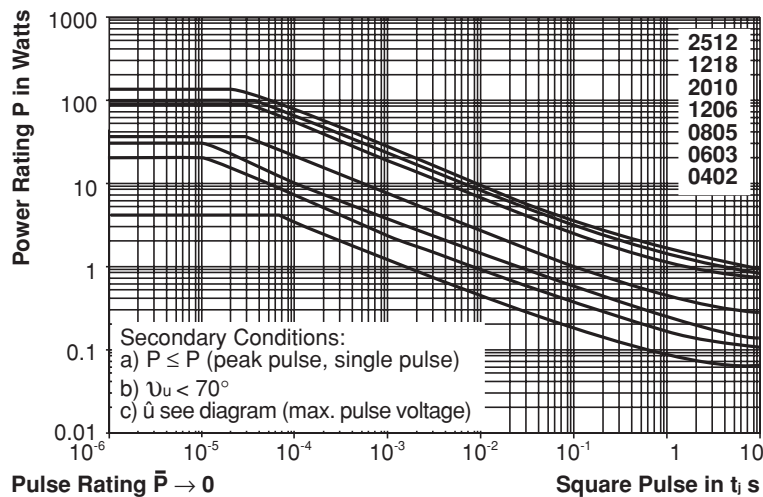
\*There are differences in board layout and measurements between CECC and EIA.



## PACKAGING

MODEL	REEL					BULK		
	TAPE WIDTH	DIAMETER	PIECES/REEL	PITCH	PACKAGING CODE		BULK FEEDING MAGAZINE PIECES/MAGAZINE	
					PAPER	BLISTER	PIECES	CODE
CRCW0201	8mm Papertape	180mm/7" 330mm/13"	10000 50000	2mm 2mm	ET7 EF4			
D10/CRCW0402	8mm Papertape	180mm/7" 330mm/13"	10000 50000	2mm 2mm	ET7 EF4		50000	E27
D11/CRCW0603	8mm	180mm/7"	5000	4mm	ET1	EG1	25000	E27
	Paper-/	255mm/10"	10000	4mm	ET5			
	Blisertape	330mm/13"	20000	4mm	ET6	E20		
D12/CRCW0805	8mm	180mm/7"	5000	4mm	ET1	EG1	10000	E27
	Paper-/	255mm/10"	10000	4mm	ET5			
	Blisertape	330mm/13"	20000	4mm	ET6	E20		
D25/CRCW1206	8mm	180mm/7"	5000	4mm	ET1	EG1		
	Paper-/	255mm/10"	10000	4mm	ET5			
	Blisertape	330mm/13"	20000	4mm	ET6	E20		
CRCW1210	8mm	180mm/7"	5000	4mm	ET1	EG1		
	Paper-/Blisertape	330mm/13"	20000	4mm	ET6	E20		
CRCW1218	12mm Blisertape	180mm/7"	4000	4mm		ET9		
CRCW2010	12mm Blisertape	180mm/7"	4000	4mm		E02		
CRCW2512	12mm	180mm/7"	2000	8mm		E67		
	Blisertape		4000	4mm		E82		







PERFORMANCE					
TEST	CONDITIONS OF TEST	REQUIREMENTS IN % <sup>1)</sup>			
		0402 0603	0805 1206 1210	1218 2010 2512	0201
Endurance Test at 70°C IEC 60115-1 4.25.1; EIA-575	1000 hours at 70°C, 1.5 hours "ON", 0.5 hours "OFF"	≤ ± 1.0	≤ ± 0.5	≤ ± 1.0	≤ ± 3.0
Endurance at UCT IEC 60115-1 4.25.3	1000 hours at 125°C without load	≤ ± 1.0	≤ ± 0.5	≤ ± 1.0	≤ ± 2.0
Overload Test IEC 60115-1 4.13; EIA-575	Short time overload, 2.5 x rated voltage or 2 x limiting element voltage.	≤ ± 0.25	≤ ± 0.25	≤ ± 0.5	≤ ± 1.0
Thermal Shock IEC 60115-1 4.19; IEC 60068-2-14; EIA-575	Rapid change between upper and lower category temperature	≤ ± 0.25	≤ ± 0.25	≤ ± 0.5	≤ ± 0.5
Damp Heat Steady State IEC 60115-1 4.24; IEC 60068-2-3	56 days at 40°C and 93% relative humidity	≤ ± 1.0	≤ ± 0.5	≤ ± 1.0	≤ ± 2.0
Resistance to Soldering Heat IEC 60115-1 4.18; IEC 60068-2-20; EIA-575	10 seconds at 260°C solder bath temperature	≤ ± 0.25	≤ ± 0.25	≤ ± 0.5	≤ ± 1.0

<sup>1)</sup> Limits for change of resistance at test acc. to CECC

APPLICABLE SPECIFICATIONS
<ul style="list-style-type: none"><li>• CECC40000/40400/40401-004,-006,-007,-802</li><li>• EN140400/IEC 60115-1</li><li>• EIA-575</li></ul>