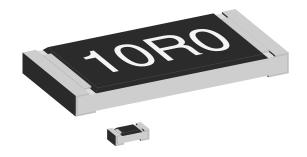


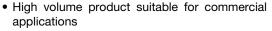
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Lead (Pb)-free Thick Film, Rectangular Commodity Chip Resistors



FEATURES





- Stability ($\Delta R/R \le 1$ % for 1000 h at 70 °C)
- Lead (Pb)-free solder contacts on Ni barrier layer
- COMPLIANT HALOGEN FREE

- · Metal glaze on ceramic
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

STANDARD E	STANDARD ELECTRICAL SPECIFICATIONS									
MODEL	CASE SIZE INCH	CASE SIZE METRIC	POWER RATING P _{70 °C} W	LIMITING ELEMENT VOLTAGE MAX. V ≅	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES		
			0.000	50	± 100	± 1	1R0 to 10M	E24; E96		
CRCW0402C	0402	RR 1005M	0.063	30	± 200	± 5	1R0 to 10M	E24		
			Zero-Ohm-Resistor: $R_{\text{max.}}$ = 20 m Ω , $I_{\text{max.}}$ at 70 °C = 1.5 A							
	0603	RR 1608M	0.10	75	± 100	± 1	1R0 to 10M	E24; E96		
CRCW0603C				75	± 200	± 5	1R0 to 10M	E24		
			Zero-Ohm-Resistor: $R_{\text{max.}}$ = 20 m Ω , $I_{\text{max.}}$ at 70 °C = 2.0 A							
			0.125	150	± 100	± 1	1R0 to 10M	E24; E96		
CRCW0805C	0805	RR 2012M	0.125	150	± 200	± 5	1R0 to 10M	E24		
Zero-Ohm-Resistor: $R_{\text{max.}} = 20 \text{ m}\Omega$, $I_{\text{max.}}$ at 70 °C = 2.5 A										
CRCW1206C	1206	RR 3216M	0.25	200	± 100	± 1	1R0 to 10M	E24; E96		
					± 200	± 5	1R0 to 10M	E24		
			Zero-Ohm-Resistor: $R_{\text{max.}} = 20 \text{ m}\Omega$, $I_{\text{max.}}$ at 70 °C = 3.5 A							

Notes

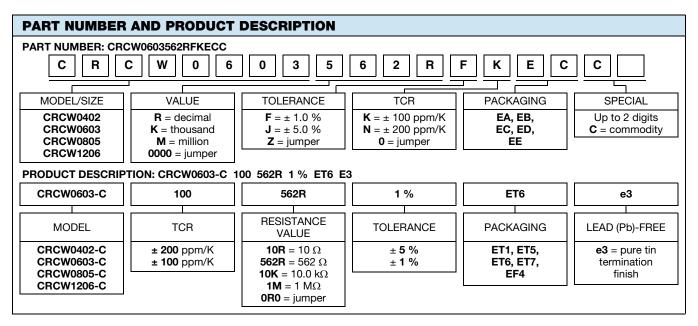
- These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over
 operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime
- · Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material

TECHNICAL SPECIFICATIONS							
PARAMETER	UNIT	CRCW0402C	CRCW0603C	CRCW0805C	CRCW1206C		
Rated dissipation at 70°C (1)	W	0.063	0.10	0.125	0.25		
Limiting element voltage U _{max.} AC/DC	V	50	75	150	200		
Insulation voltage $U_{\text{ins.}}$ (1 min)	V	> 75	> 100	> 200	> 300		
Insulation resistance	Ω		> `	10 ⁹			
Category temperature range	°C		- 55 to	+ 155			
Failure rate	h ⁻¹	0.1 x 10 ⁻⁹					
Weight/1000 pieces	g	0.65	2	5.5	10		

Note

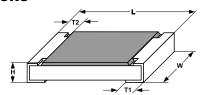
⁽¹⁾ The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155 °C is not exceeded

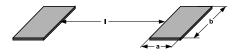




PACKAGING							
TYPE / SIZE	CODE	QUANTITY	PACKAGING STYLE	WIDTH	PITCH	PACKAGING DIMENSIONS	
CRCW0402C	ED = ET7	10 000		8 mm	2 mm	Ø 180 mm/7"	
ChCW0402C	EE = EF4	50 000				Ø 330 mm/13"	
	EA = ET1	5000	Paper tape acc. to IEC 60286-3, Type 1a		4 mm	Ø 180 mm/7"	
CRCW0603C	EB = ET5	10 000				Ø 254 mm/10"	
	EC = ET6	20 000				Ø 330 mm/13"	
	EA = ET1	5000			4 mm	Ø 180 mm/7"	
CRCW0805C	EB = ET5	10 000				Ø 254 mm/10"	
	EC = ET6	20 000				Ø 330 mm/13"	
CRCW1206C	EA = ET1	5000			4 mm	Ø 180 mm/7"	
	EB = ET5	10 000				Ø 254 mm/10"	
	EC = ET6	20 000				Ø 330 mm/13"	

DIMENSIONS





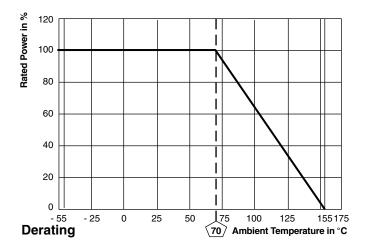
CITE DIMENSIONS (in millimators)					SOLDER PAD DIMENSIONS (1) (in millimeters)							
	SIZE DIMENSIONS (in millimeters)			REFLOW SOLDER			G WAVE SOLDERING					
INCH	METRIC	L	W	Н	T1	T2	а	b	I	а	b	I
0402	1005	1.0 ± 0.10	0.5 ± 0.05	0.30 ± 0.05	0.25 ± 0.10	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	2.0 ± 0.10	1.25 ± 0.15	0.50 ± 0.10	0.35 ± 0.15	0.35 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	3.05 ± 0.10	1.55 ± 0.10	0.55 + 0.10 - 0.05	0.35 ± 0.15	0.45 ± 0.2	0.9	1.7	2.0	1.1	1.7	2.3

Note

⁽¹⁾ The rated dissipation applies only if the permitted film temperature is not exceeded. Furthermore, a high level of ambient temperature or of power dissipation may raise the temperature of the solder joint, hence special solder alloys or board materials maybe required to maintain the reliability of the assembly. Specified power rating above 125 °C requires dedicated heat-sink pads, which depend on board materials. The given solder pad dimensions reflect the considerations for board design and assembly as outlined e.g. in standards IEC 61188-5-x, or in publication IPC-7351. They do not guarantee any supposed thermal properties, particularly as these are also strongly influenced by many other parameters. Still the given solder pad dimensions will be found adequate for most general applications



FUNCTIONAL PERFORMANCE



TEST PR	OCEDURES	S AND REQUIF	REMENTS				
EN 60115-1	IEC 60068-2				REQUIREMENTS CHANG		
CLAUSE	TEST METHOD	TEST PROCEDURE		OCEDURE	STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER	
			Stability for prod	luct types:			
				CRCWC e3	1 Ω to 10 MΩ	1 Ω to 10 MΩ	
4.5	-	Resistance		-	± 1 %	± 5 %	
4.8.4.2	-	Temperature coefficient		5/20) °C and 125/20) °C	± 100 ppm/K	± 200 ppm/K	
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70}}$	$\overline{x R} \le 2 \times U_{\text{max.}}$ 5 s	± (2 % R	+ 0.1 Ω)	
4.17.5	E0 (T4)	58 (Td) Solderability	Pre-aging 4 h at 155 °C, dryheat	Solder bath method; Sn60Pb40 non activated flux; (235 ± 5) °C (2 ± 0.2) s	Good tinning (≥ 95 % covered) no visible damage		
	36 (Tu)			Solder bath method; Sn96.5Ag3Cu0.5 non activated flux; (245 ± 5) °C (3 ± 0.3) s	Good tinning (≥ 95 % covered) no visible damage		
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 ± 5) °C; (10 ± 1) s		± (1% R + 0.05 Ω)		
4.19	14 (Na)	Rapid change of temperature	30 min. at - 55 °C; 30 min. at 125 °C; 5 cycles		± (0.25 % R + 0.05 Ω)	$\pm (0.5 \% R + 0.05 \Omega)$	
4.24	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; 56 days; (93 ± 3) % RH		± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)	
4.36	-	Operation at low temperature	-55 °C, 1 h		± (1 % R	+ 0.05 Ω)	
4.25.1		Endurance	$U = \sqrt{P_{70} \times R} \le U_{\text{max.};}$ 1.5 h on; 0.5 h off;				
	-	at 70 °C	70 °C; 1000 h		± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)	
			70 °	C; 8000 h	± (2 % R + 0.1 Ω)	± (4 % R + 0.1 Ω)	
4.25.3	-	Endurance at upper category temperature	155 °C, 1000 h		± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)	



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APPLICABLE SPECIFICATIONS

EN 60115-1 Generic specification
 EN 140400 Sectional specification
 EN 140401-802 Detail specification

• IEC 60068-2-X Variety of environmental test procedures

• IEC 60286-3 Packaging of SMD components



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