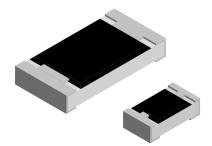


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Lead (Pb)-Bearing Thick Film, Rectangular High Value Chip Resistor



FEATURES

HALOGEN FREE

- High resistance values (up to 470M)
- Suitable for voltage dividers and hybrids
- Lead (Pb)-bearing termination plating on Ni barrier layer
- Metal glaze on high quality ceramic
- Material categorization: For definitions of compliance please see <u>www.vishay.com/doc?99912</u>

STANDARD ELECTRICAL SPECIFICATIONS									
MODEL	CASE SIZE INCH	CASE SIZE METRIC	POWER RATING P ₇₀ W	LIMITING ELEMENT VOLTAGE U _{max.} AC _{RMS} /DC V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	SERIES	
D11/CRCW0603-HR	0603	RR 1608M	0.10	75	± 500	± 5	11M to 470M	E24	
D12/CRCW0805-HR	0805	RR 2012M	0.125	150	± 500	± 5	11M to 470M	E24	
D25/CRCW1206-HR	1206	RR 3216M	0.25	200	± 500	± 5	11M to 470M	E24	

Notes

- These resistors do not feature a limited lifetime when operated within the limits of rated dissipation, permissible operating voltage, and permissible film temperature. However, the resistance typically increase due to the resistor's film temperature over operating time, generally known as drift. The drift may exceed the stability requirements of an individual application circuit and thereby limits the functional time.
- Marking and packaging: See datasheet "Surface Mount Resistor Marking" (<u>www.vishay.com/doc?20020</u>)
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

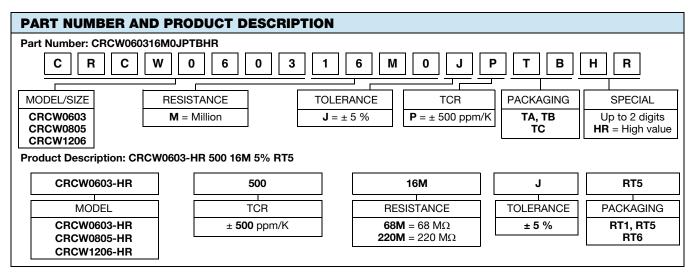
TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	D11/CRCW0603-HR	D12/CRCW0805-HR	D25/CRCW1206-HR		
Rated Dissipation at P_{70} ⁽¹⁾	W	0.1	0.125	0.25		
Operating Voltage U _{max.} AC _{RMS} /DC	V	75	150	200		
Voltage Coefficient	%/V		< 100M: < 0.1 > 100M: < 0.3			
Insulation Voltage <i>U</i> ins (1 min)	V	100	100 200 300			
Insulation Resistance	Ω	> 10 ⁹				
Operating Temperature Range	°C	- 55 to + 155				
Weight	mg	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.

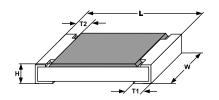


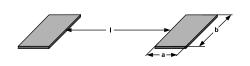
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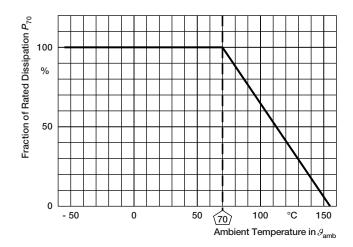
PACKAGING								
MODEL	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER		
	TA = RT1	5000		8 mm	4 mm	180 mm/7"		
CRCW0603-HR	TB = RT5	10 000				285 mm/11.25"		
	TC = RT6 20 000					330 mm/13"		
	TA = RT1	5000	Paper tape acc. to	8 mm	4 mm	180 mm/7"		
CRCW0805-HR	TB = RT5	10 000	IEC 60068-3 Type I			285 mm/11.25"		
	TC = RT6	20 000				330 mm/13"		
	TA = RT1 5000					180 mm/7"		
CRCW1206-HR	TB = RT5	10 000	1	8 mm	4 mm	285 mm/11.25"		
	TC = RT6	20 000				330 mm/13"		

DIMENSIONS





CITE DIMENSIONS in millimators						SOLDER PAD DIMENSIONS in millimeters						
"	SIZE DIMENSIONS in millimeters						REFLOW SOLDERING WAVE SOLDERIN			RING		
INCH	METRIC	L W H T1 T2		а	b	1	а	b	I			
0603	1608	1.55 ^{+ 0.10} - 0.05	0.85 ± 0.1	0.45 ± 0.05	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	2.0 + 0.20 - 0.10	1.25 ± 0.15	0.45 ± 0.05	0.3 + 0.20 - 0.10	0.3 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	3.2 + 0.10 - 0.20	1.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	1.7	2.0	1.1	1.7	2.3



TEST PROCEDURES AND REQUIREMENTS							
EN 60115-1 CLAUSE	IEC 60068-2 TEST	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (ΔR) STABILITY CLASS 2 OR BETTER			
CLAUSE	METHOD						
			Stability for product types:				
			D/CRCW-HR	11 M Ω to 470 M Ω			
4.5	_	Resistance	-	± 5 %			
4.13	_	Short time overload	$U = 2.5 \times \sqrt{P_{70}} \times R \le 2 \times U_{\text{max.}};$ Duration acc. to style	± (0.5 % R + 0.05 Ω)			
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40	Good tinning (≥ 95 % covered); no visible damage			
4.8.4.2	_	Temperature coefficient	20 °C/- 55 °C/20 °C and 20 °C/125 °/20 °C	± 500 ppm/K			
4.32	21 (Uu ₃)	Shear (adhesion)	RR 1608: 9 N RR 2012 and RR 3216: 45 N	No visible damage			
4.33	21 (Uu ₁)	Substrate bending	Depth 2 mm; 3 times	No visible damage, no open circuit in bent position $\pm \ (0.25 \ \textit{M} \ \textit{R} \ + 0.05 \ \Omega)$			
4.19	14 (Na)	Rapid change of temperature	30 min. at - 55 °C; 30 min. at 125 °C 5 cycles 1000 cycles	± (0.5 % R + 0.05 Ω) ± (1 % R + 0.05 Ω)			
4.23 4.23.2 4.23.3	2 (Ba) 30 (Db)	Climatic sequence: Dry Heat Damp heat, cyclic	- 125 °C; 16 h 55 °C; ≥ 90 % RH; 24 h; 1 cycle				
4.23.4 4.23.5	1 (Aa) 13 (M)	Cold Low air pressure	- 55 °C; 2 h 1 kPa; (25 ± 10) °C; 1 h	± (2 % R + 0.1 Ω)			
4.23.6 4.23.7	30 (Db) -	Damp heat, cyclic D.C. Load	55 °C; \geq 90 % RH 24 h; 5 cycle $U = \sqrt{P_{70}} \times R$				
4.25.1	-	Endurance at 70 °C	$U = \sqrt{P_{70}} \times R \le U_{\text{max.}}$ 1.5 h on; 0.5 h off; 70 °C; 1000 h 70 °C; 8000 h	± (2 % R + 0.1 Ω) ± (4 % R + 0.1 Ω)			



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TEST PROCEDURES AND REQUIREMENTS						
EN 60115-1	IEC 60068-2	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (△R)		
CLAUSE	TEST METHOD	1		STABILITY CLASS 2 OR BETTER		
			Stability for product types:			
		D/CRCW-HR	11 M Ω to 470 M Ω			
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 ± 5) °C; (10 ± 1) s	± (0.5 % R + 0.05 Ω)		
4.24	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; (93 ± 3) % RH; 56 days	± (2 % R + 0.1 Ω)		
4.25.3	-	Endurance at upper category temperature	155 °C; 1000 h	± (2 % R + 0.1 Ω)		

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- IEC 60068-2-x, variety of environmental test procedures

Packaging of components is done in paper or blister tapes according to IEC 60286-3.



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