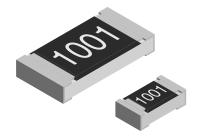


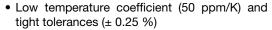
www.vishay.com

Vishay

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



FEATURES





 Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processing ROHS COMPLIANT HALOGEN FREE

- Metal glaze on high quality ceramic
- AEC-Q200 qualified
- Material categorization: For definitions of compliance please see <u>www.vishay.com/doc?99912</u>

STANDARD EI	LECTRI	CAL SP	ECIFICA	TIONS				
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
D10/CRCW0402-P	0402	1005	0.063	50	± 100	± 0.5	1R to 1M1	E24; E96
D10/ChCVV0402-F	0402	1003	0.003	30	± 50	± 0.25, ± 0.5, ± 1	100R to 1M	L24, L90
					± 100	± 0.5, ± 0.25	1R to 10M	
D11/CRCW0603-P	0603	1608	0.1	75	± 50	± 0.25	100R to 1M	E24; E96
					± 50	± 0.5, ± 1	100R to 10M	
					± 100	± 0.5	10R to 10M	
D12/CRCW0805-P	0805	2012	0.125	150	± 50	± 0.25	100R to 1M	E24; E96
					± 30	± 0.5, ± 1	100R to 10M	
					± 100	± 0.5	10R to 10M	
D25/CRCW1206-P	1206	3216	0.25	200	± 50	± 0.25	100R to 1M	E24; E96
					± 50	± 0.5, ± 1	100R to 10M	
CRCW1210-P	1210	3225	0.5	200	± 100	± 0.5	100R to 1M	E24: E96
ChCW1210-P	1210	3223	0.5	200	± 50	± 0.5, ± 1	100R to 1M	E24, E90
CRCW1218-P	1218	3246	1.0	200	± 100	± 0.5	100R to 2M2	E24; E96
UNUVV 12 10-F	1210	3240	1.0	200	± 50	± 0.5, ± 1	100R to 2M2	L24, E90
CRCW2010-P	2010	5025	0.75	400	± 100	± 0.5	10R to 10M	E24; E96
UNUVV2010-F	2010	3023	0.75	400	± 50	± 0.5, ± 1	100R to 10M	L24, E90
CDCW0510 D	2512	6332	1.0	500	± 100	± 0.5	10R to 10M	E24; E96
CRCW2512-P	2012	0332	1.0	500	± 50	± 0.5, ± 1	100R to 10M	⊏24, ⊑96

Notes

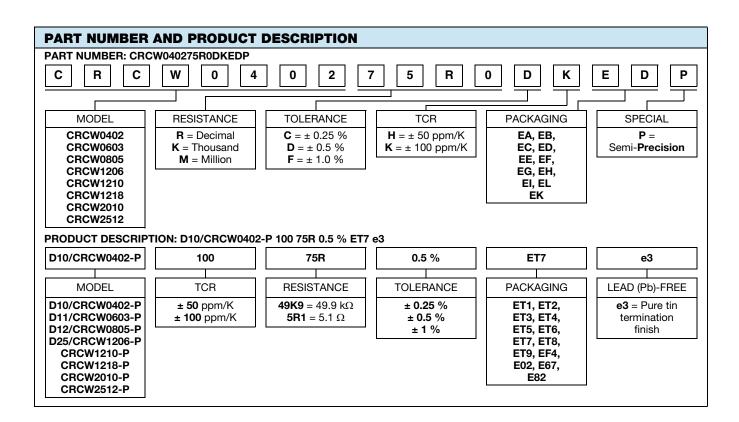
- These resistors do not feature a limited lifetime when operated within the limits of rated dissipation, permissible operating voltage and
 permissible film temperature. However, the resistance typically increase due to the resistor's film temperature over operating time generally
 known as drift. The 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 SPECIFIC	ATIO	NS							
PARAMETER	UNIT	D10/ CRCW0402-P	D11/ CRCW0603-P	D12/ CRCW0805-P	D25/ CRCW1206-P	CRCW1210-P	CRCW1218-P	CRCW2010-P	CRCW2512-P
Rated Dissipation at P ₇₀ (1)	W	0.063	0.1	0.125	0.25	0.5	1.0	0.75	1.0
Operating Voltage U _{max.} AC _{RMS} /DC	V	50	75	150	200	200	200	400	500
Insulation Voltage Uins (1 min)	V	75	100	200	300	300	300	300	300
Insulation Resistance	Ω				> .	10 ⁹			
Operating Temperature Range	°C				- 55 to	+ 155			
Failure Rate	h ⁻¹				< 0.1	x 10 ⁻⁹			
Weight	mg	0.65	2	5.5	10	16	29.5	25.5	40.5

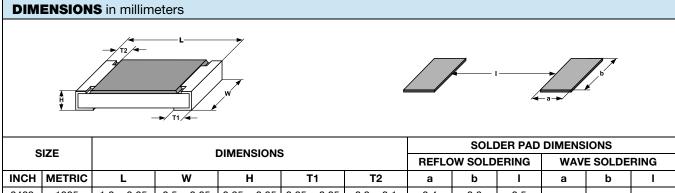
Note

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



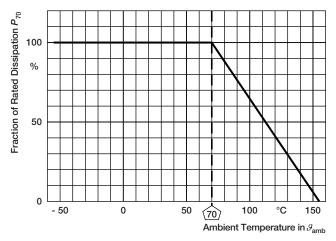


PACKAGING						
MODEL	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
D10/CRCW0402-P	ED = ET7	10 000		8 mm	2 mm	180 mm/7"
D10/ChCVV0402-P	EE = EF4	50 000		0 111111	2 111111	330 mm/13"
	EI = ET2	5000				180 mm/7"
	ED = ET3	10 000		8 mm	2 mm	180 mm/7"
	EL = ET4	20 000		0 111111	2 111111	285 mm/11.25"
D11/CRCW0603-P	EE = ET8	50 000				330 mm/13"
	EA = ET1	5000				180 mm/7"
	EB = ET5	10 000		8 mm 4 mm	4 mm	285 mm/11.25"
	EC = ET6	20 000	Paper tape acc. to IEC 60068-3			330 mm/13"
	EA = ET1	5000	Type I			180 mm/7"
D12/CRCW0805-P	EB = ET5	10 000	71	8 mm	4 mm	285 mm/11.25"
	EC = ET6	20 000				330 mm/13"
	EA = ET1	5000				180 mm/7"
D25/CRCW1206-P	EB = ET5	10 000		8 mm	4 mm	285 mm/11.25"
	EC = ET6	20 000				330 mm/13"
	EA = ET1	5000]			180 mm/7"
CRCW1210-P	EB = ET5	10 000		12 mm	4 mm	285 mm/11.25"
	EC = ET6	20 000				330 mm/13"
CRCW1218-P	EK = ET9	4000		12 mm	4 mm	180 mm/7"
CRCW2010-P	EF = E02	4000	Blister tape acc. to IEC 60068-3	12 mm	4 mm	180 mm/7"
CDCW0510 D	EG = E67	2000	Type II	10	8 mm	100 /7"
CRCW2512-P	EH = E82	4000	71/2	12 mm	4 mm	180 mm/7"



	176		DIMENSIONS -										
3	SIZE		!	DINIEROIORO					ERING	WAV	E SOLDE	RING	
INCH	METRIC	L	W	Н	T1	T2	а	b	I	а	b	I	
0402	1005	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 ± 0.05	0.2 ± 0.1	0.4	0.6	0.5				
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	
1210	3225	3.2 ± 0.2	2.5 ± 0.2	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	2.5	2.0	1.1	2.5	2.2	
1218	3246	3.2 ^{+ 0.10} _{- 0.20}	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	1.05	4.9	1.9	1.25	4.8	1.9	
2010	5025	5.0 ± 0.15	2.5 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	2.5	3.9	1.2	2.5	3.9	
2512	6332	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	3.2	5.2	1.2	3.2	5.2	

FUNCTIONAL PERFORMANCE



TEST PR	TEST PROCEDURES AND REQUIREMENTS						
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (Δ <i>R</i>)			
			Stability for product types:	STABILITY CLASS 1 OR BETTER			
			D/CRCW-P e3	1 Ω to 10 M Ω			
4.5	-	Resistance	-	± 0.25 %; ± 0.5 %; ± 1 %			
4.7	-	Voltage proof	$U = 1.4 \times U_{ins}$; 60 s	No flashover or breakdown			
4.13	-	Short time overload	$U = 2.5 \text{ x } \sqrt{P_{70} \text{ x } R} \le 2 \text{ x } U_{\text{max.}};$ duration acc. to style	± (0.25 % R + 0.05 Ω)			
4.17.2		Caldarahilitu	Solder bath method; Sn60Pb40 non-activated flux; (235 ± 5) °C (2 ± 0.2) s	Good tinning (≥ 95 % covered) no visible damage			
4.17.2	58 (Td)	Solderability	Solder bath method; Sn96.5Ag3Cu0.5 non-activated flux; (245 ± 5) °C (3 ± 0.3) s	Good tinning (≥ 95 % covered) no visible damage			
4.8.4.2	-	Temperature coefficient	(20/- 55/20) °C and (20/125/20) °C	± 50 ppm/K; ± 100 ppm/K			
4.32	21 (Uu ₃)	Shear (adhesion)	RR 1608 and smaller: 9 N RR 2012 and larger: 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 % R + 0.05 Ω)			
4.19	14 (Na)	Rapid change of temperature	30 min at - 55 °C; 30 min at 125 °C 5 cycles 1000 cycles	± (0.25 % R + 0.05 Ω) ± (1 % R + 0.05 Ω)			



www.vishay.com

EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD		PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (Δ <i>R</i>)		
			Stability for product types:	STABILITY CLASS 1 OR BETTER		
			D/CRCW-P e3	1 Ω to 10 MΩ		
4.23	-	Climatic sequence:	-			
4.23.2	2 (Ba)	Dry heat	125 °C; 16 h			
4.23.3	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 1 cycle			
4.23.4	1 (Aa)	Cold	- 55 °C; 2 h	$\pm (1 \% R + 0.05 \Omega)$		
4.23.5	13 (M)	Low air pressure	1 kPa; (25 ± 10) °C; 1 h			
4.23.6	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 5 cycles			
4.23.7	-	DC load	$U = \sqrt{P_{70} \times R}$			
4.05.4			$U = \sqrt{P_{70} \times R} \le U_{\text{max.}};$ 1.5 h on; 0.5 h off;			
4.25.1	-	Endurance at 70 °C	70 °C; 1000 h	\pm (1 % R + 0.05 Ω)		
			70 °C; 8000 h	± (2 % R + 0.05 Ω)		
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 ± 5) °C; (10 ± 1) s	$\pm (0.25 \% R + 0.05 \Omega)$		
4.35	-	Flamability, needle flame test	IEC 60695-11-5; 10 s	No burning after 30 s		
4.24	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; (93 ± 3) % RH; 56 days	± (1 % R + 0.05 Ω)		
4.25.3	-	Endurance at upper category temperature	155 °C, 1000 h	± (1 % R + 0.05 Ω)		
4.40	-	Electrostatic discharge (human body model)	IEC 61340-3-1; 3 pos. + 3 neg. discharges; ESD voltage acc. to size	± (1 % R + 0.05 Ω)		
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 °C; method 2	No visible damage		
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 °C; method 1, toothbrush	Marking legible, no visible damage		
4.22	6 (Fc)	Vibration, endurance by sweeping	f = 10 Hz to 2000 Hz; x, y, z \leq 1.5 mm; A \leq 200 m/s ² ; 10 sweeps per axis	\pm (0.25 % R + 0.05 Ω)		
4.37	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R}$ $\leq 2 \times U_{\text{max.}};$ 0.1 s on; 2.5 s off; 1000 cycles	± (1 % R + 0.05 Ω)		
4.27	-	Single pulse high voltage overload, 10 µs/700 µs	$\hat{U} = 10 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{\text{max.};}$ 10 pulses	± (1 % R + 0.05 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.



Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

单击下面可查看定价,库存,交付和生命周期等信息

>>Vishay(威世)

>>点击查看相关商品