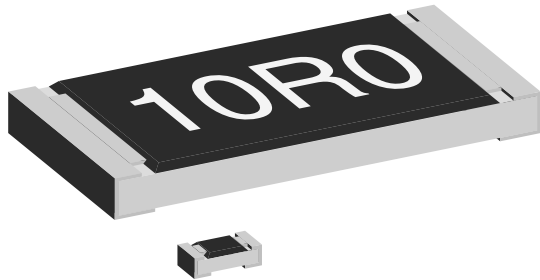


Lead (Pb)-free Thick Film, Rectangular, Pulse Proof Chip Resistors



FEATURES

- High pulse performance
- 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 ($\Delta R/R \leq \pm 1\%$ for 1000 h at 70 °C) in different environmental conditions



STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING $P_{70}^{\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
	INCH	METRIC						
D10/CRCW0402-IF	0402	1005	0.063	50	± 200	$\pm 5, \pm 10$	1R0 - 100K	E24
D11/CRCW0603-IF	0603	1608	0.10	75	± 200	$\pm 5, \pm 10$	1R0 - 100K	E24
D12/CRCW0805-IF	0805	2012	0.125	150	± 200	$\pm 5, \pm 10$	1R0 - 100K	E24
D25/CRCW1206-IF	1206	3216	0.25	200	± 200	$\pm 5, \pm 10$	1R0 - 100K	E24

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.
- 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

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	D10/CRCW0402-IF	D11/CRCW0603-IF	D12/CRCW0805-IF	D25/CRCW1206-IF
Rated Dissipation at $P_{70}^{(1)}$	W	0.063	0.10	0.125	0.25
Limiting Element Voltage $U_{\text{max. AC/DC}}$	V	50	75	150	200
Insulation Voltage U_{ins} (1 min)	V	> 75	> 100	> 200	> 300
Thermal Resistance	K/W	≤ 870	≤ 550	≤ 440	≤ 220
Insulation Resistance	Ω	$> 10^9$			
Category Temperature Range	$^{\circ}\text{C}$	- 55 to + 155			
Weight	mg	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.

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: CRCW08051R00JNEAIF⁽²⁾

C R C W 0 8 0 5 1 R 0 0 J N E A I F

MODEL/SIZE	VALUE	TOLERANCE	TCR	PACKAGING ⁽³⁾	SPECIAL
CRCW0402 CRCW0603 CRCW0805 CRCW1206	R = Decimal K = Thousand	J = $\pm 5\%$ K = $\pm 10\%$	N = ± 200 ppm/K S = Special	EA, EB, EC ED, EE, EI, EL	Up to 2 digits IF = Pulse

PRODUCT DESCRIPTION: D12/CRCW0805-IF 200 1R0 5 % ET1 e3

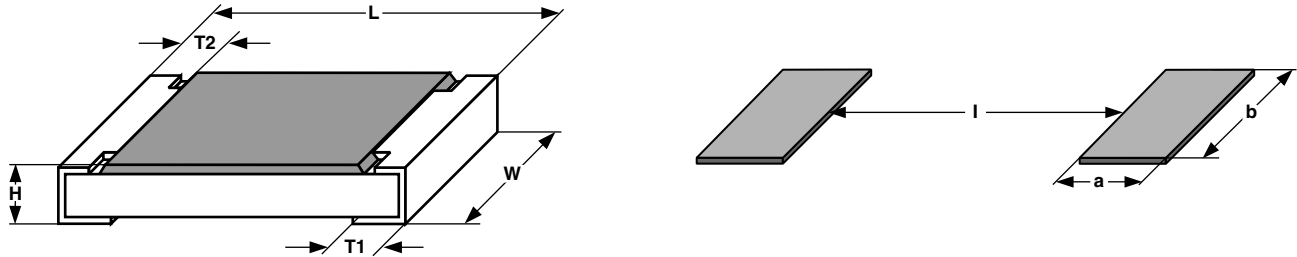
D12/CRCW0805-IF	200	1R0	5 %	ET1	e3
MODEL	TCR	RESISTANCE VALUE	TOLERANCE	PACKAGING ⁽³⁾	LEAD (Pb)-FREE
D10/CRCW0402-IF D11/CRCW0603-IF D12/CRCW0805-IF D12/CRCW1206-IF	± 200 ppm/K	1R0 = 1 Ω 10K = 10.0 k Ω	$\pm 5\%$ $\pm 10\%$	ET1, ET5, ET6, ET7, EF4, EG1, E20	e3 = Pure tin Terminal finish

Notes

- ⁽²⁾ Preferred way for ordering products is by use of the PART NUMBER
⁽³⁾ Please refer to table PACKAGING, see next page

PACKAGING

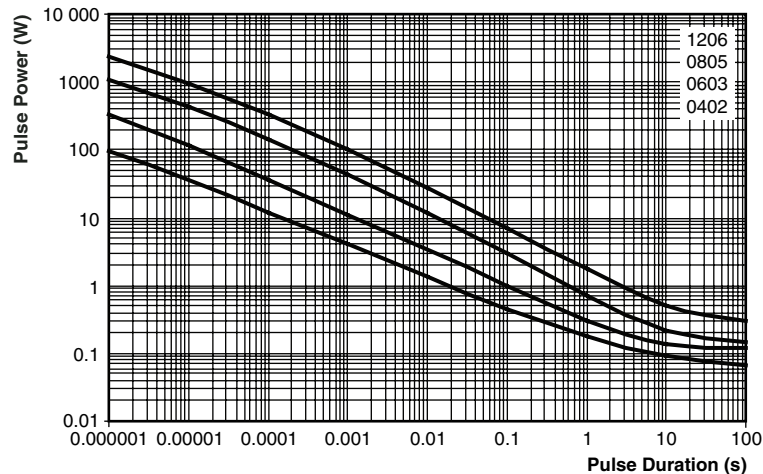
MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/ REEL	PACKING CODE			
					PART NUMBER		PRODUCT DESC.	
					PAPER	BLISTER	PAPER	BLISTER
D10/CRCW0402-IF	8 mm	180 mm/7"	2 mm	10 000	ED		ET7	
		330 mm/13"	2 mm	50 000	EE		EF4	
D11/CRCW0603-IF	8 mm	180 mm/7"	4 mm	5000	EA	EI	ET1	EG1
		285 mm/11.25"	4 mm	10 000	EB		ET5	
		330 mm/13"	4 mm	20 000	EC	EL	ET6	E20
D12/CRCW0805-IF	8 mm	180 mm/7"	4 mm	5000	EA	EI	ET1	EG1
		285 mm/11.25"	4 mm	10 000	EB		ET5	
		330 mm/13"	4 mm	20 000	EC	EL	ET6	E20
D25/CRCW1206-IF	8 mm	180 mm/7"	4 mm	5000	EA	EI	ET1	EG1
		285 mm/11.25"	4 mm	10 000	EB		ET5	
		330 mm/13"	4 mm	15 000		EL		E20
		330 mm/13"	4 mm	20 000	EC		ET6	

DIMENSIONS


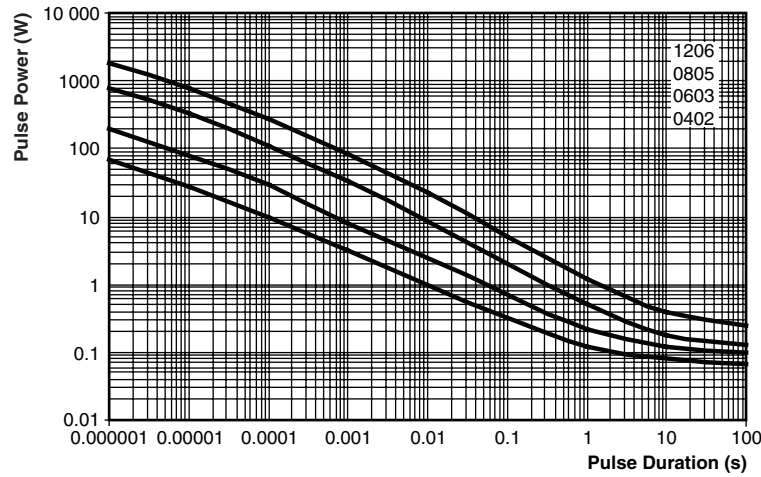
SIZE		DIMENSIONS (in millimeters)					SOLDER PAD DIMENSIONS (in millimeters)					
							REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC	L	W	H	T1	T2	a	b	l	a	b	l
0402	1005	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 ± 0.05	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1.55 ^{+0.10} / _{-0.05}	0.85 ± 0.1	0.45 ± 0.05	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	2.0 ^{+0.10} / _{-0.20}	1.25 ± 0.15	0.45 ± 0.05	0.3 ± 0.2	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

FUNCTIONAL PERFORMANCE

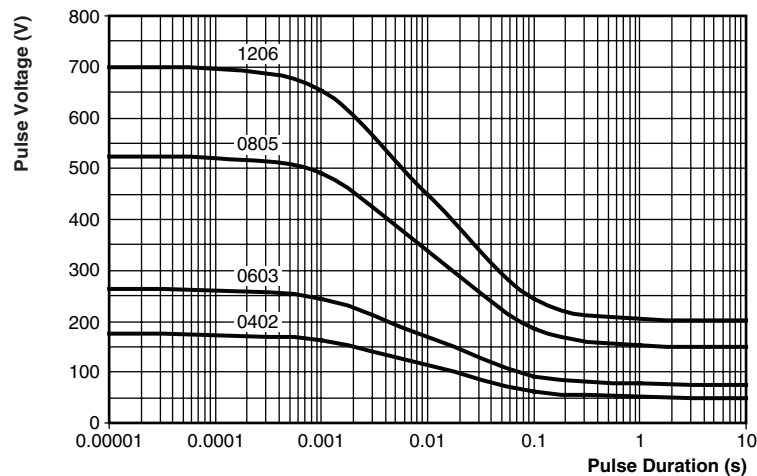
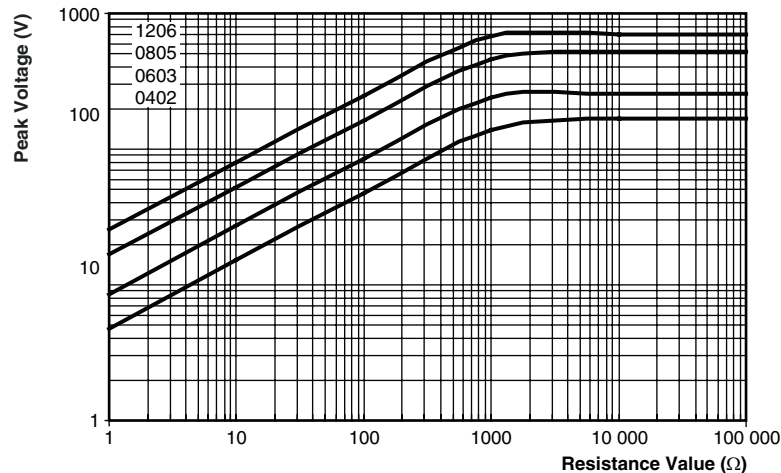
Maximum pulse dissipation as a function of the pulse duration, single pulse


Maximum pulse load, single pulse; applicable if $\bar{P} \rightarrow 0$ and $n \leq 1000$ and $\dot{U} \leq \dot{U}_{max}$; for permissible resistance change equivalent to 8000 h operation

Maximum pulse dissipation as a function of the pulse duration, continuous pulse

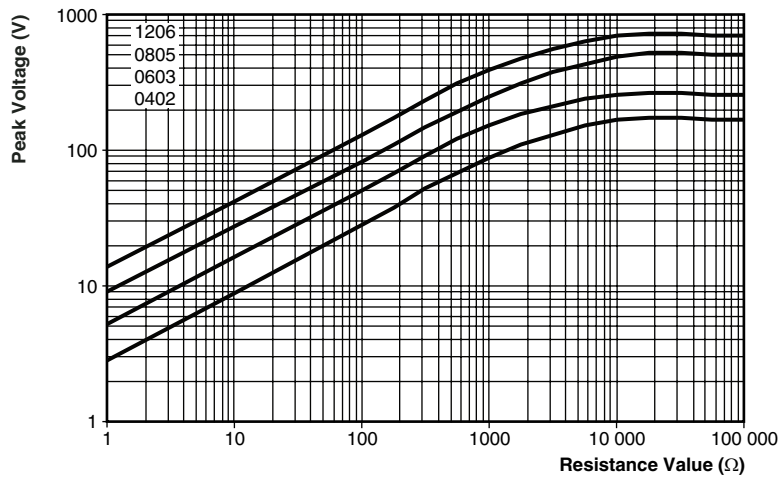


Maximum permissible pulse voltage as a function of pulse duration

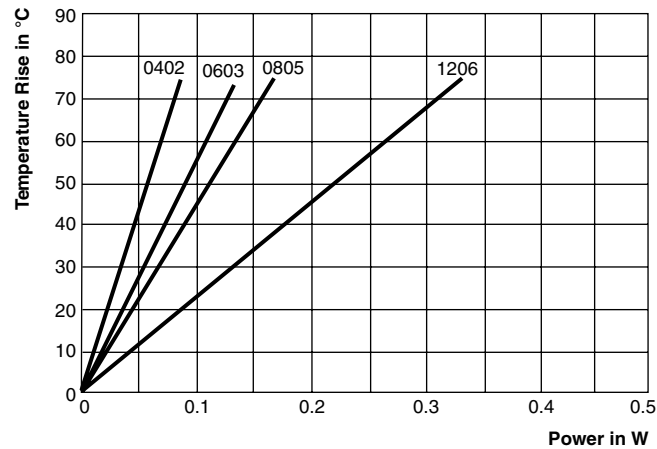
Single-pulse high voltage overload test 1.2/50 μ s EN140000 4.27



Single-pulse high voltage overload test 10/700 μ s EN140000 4.27



Pulse load rating in accordance to EN 60115-1, 4.27; 10 μ s/700 μ s;
10 pulses at 1 min intervals; for permissible resistance change 1 %



Temperature Rise

TEST PROCEDURES AND REQUIREMENTS

EN 60115-1			
TEST (clause)	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$)	
		STABILITY CLASS 1 OR BETTER	
	Stability for product types:		
	D../CRCW....-IF e3	1 Ω to 100 k Ω	
Resistance (4.5)	-	$\pm 5 \%$	$\pm 10 \%$
Temperature coefficient (4.8.4.2)	20/- 55/20 $^{\circ}\text{C}$ and 20/125/20 $^{\circ}\text{C}$	± 200 ppm/K	
Overload (4.13)	$U = 2.5 \times (P_{70} \times R)^{1/2}$ $\leq 2 \times U_{\text{max.}}$; Duration: according the style	$\pm (0.25 \% R + 0.05 \Omega)$	
Solderability (4.17.5)	Aging 4 h at 155 $^{\circ}\text{C}$, dryheat solder bath method; 235 $^{\circ}\text{C}$; 2 s visual examination	Good tinning ($\geq 95 \%$ covered) no visible damage	
Resistance to soldering heat (4.18.2)	Solder bath method; (260 ± 5) $^{\circ}\text{C}$; (10 ± 1) s	$\pm (0.25 \% R + 0.05 \Omega)$	
Rapid change of temperature (4.19)	30 min at LCT = - 55 $^{\circ}\text{C}$; 30 min at UCT = 125 $^{\circ}\text{C}$; 5 cycles	$\pm (0.25 \% R + 0.05 \Omega)$	
Damp heat, steady state (4.24)	(40 ± 2) $^{\circ}\text{C}$; 56 days; (93 ± 3) % RH	$\pm (1 \% R + 0.05 \Omega)$	
Climatic sequence (4.23)	16 h at UCT = 125 $^{\circ}\text{C}$; 1 cycle at 55 $^{\circ}\text{C}$; 2 h at LCT = - 55 $^{\circ}\text{C}$; 1 h/1 kPa at 15 $^{\circ}\text{C}$ to 35 $^{\circ}\text{C}$; 5 cycles at 55 $^{\circ}\text{C}$ $U = (P_{70} \times R)^{1/2}$ $U = U_{\text{max.}}$; whichever is less severe	$\pm (1 \% R + 0.05 \Omega)$	
Endurance at 70 $^{\circ}\text{C}$ (4.25.1)	$U = (P_{70} \times R)^{1/2}$ $U = U_{\text{max.}}$; whichever is less severe 1.5 h on; 0.5 h off; 70 $^{\circ}\text{C}$; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	
Extended endurance (4.25.1.8)	Duration extended to 8000 h	$\pm (2 \% R + 0.1 \Omega)$	
Endurance at upper category temperature (4.25.3)	UCT = 125 $^{\circ}\text{C}$; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	

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 |



Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.