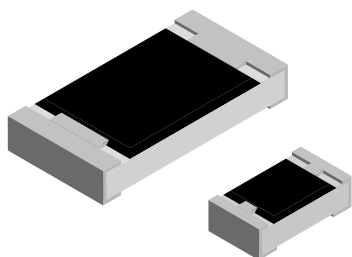


Pulse Proof, High Power Thick Film Chip Resistors



FEATURES

- Excellent pulse load capability
- Enhanced power rating
- Double side printed resistor element
- 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
- Compliant to RoHS directive 2002/95/EC
- AEC-Q200, rev. C compliant



STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING P_{70} W	LIMITING ELEMENT VOLTAGE MAX. V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
	INCH	METRIC						
CRCW0402-HP e3	0402	1005	0.125 ⁽¹⁾	50	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 2.5 A$					
CRCW0603-HP e3	0603	1608	0.25	75	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 4 A$					
CRCW0805-HP e3	0805	2012	0.33	150	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 5 A$					
CRCW1206-HP e3	1206	3216	0.5	200	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 6 A$					
CRCW2010-HP e3	2010	5025	1.0	400	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 10 A$					
CRCW2512-HP e3	2512	6332	1.5	500	± 100	± 1	1R to 1M	E24 + E96 E24
					± 200	± 5		
			Zero-Ohm-Resistor: $R_{\max.} = 0.010 \Omega$, $I_{\max.} = 14 A$					

Notes

⁽¹⁾ CRCW0402-HP resistors feature a single side printed resistive layer only

- 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 page
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRCW0402-HP	CRCW0603-HP	CRCW0805-HP	CRCW1206-HP	CRCW2010-HP	CRCW2512-HP
Rated Dissipation P_{70} ⁽¹⁾	W	0.125	0.25	0.33	0.5	1.0	1.5
Limiting Element Voltage $U_{\text{max. AC/DC}}$	V	50	75	150	200	400	500
Insulation Voltage $U_{\text{ins.}}$ (1 min)	V	> 75	> 100	> 200	> 300		
Insulation Resistance	Ω	> 10 ⁹					
Category Temperature Range	°C	- 55 to + 155					
Weight	mg	0.65	2	5.5	10	25.5	42

Note

⁽¹⁾ The power dissipation on the resistors 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 $^{\circ}C$ is not exceeded.

**PART NUMBER AND PRODUCT DESCRIPTION**PART NUMBER: CRCW0603562RFKEAHP ⁽¹⁾

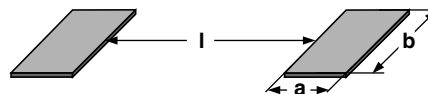
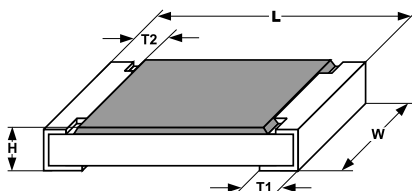
C	R	C	W	0	6	0	3	5	6	2	R	F	K	E	A	H	P
MODEL/SIZE				VALUE				TOLERANCE				TCR		PACKAGING ⁽²⁾		SPECIAL	
CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW2010 CRCW2512				R = Decimal K = Thousand M = Million 0000 = Jumper				F = ± 1 % J = ± 5 % Z = Jumper				K = ± 100 ppm/K N = ± 200 ppm/K 0 = Jumper		EA EB EC ED EE EI EL EF EG EH		Up to 2 digits HP = Pulse proof, High Power	

PRODUCT DESCRIPTION: CRCW0603-HP 100 562R 1 % ET1 e3

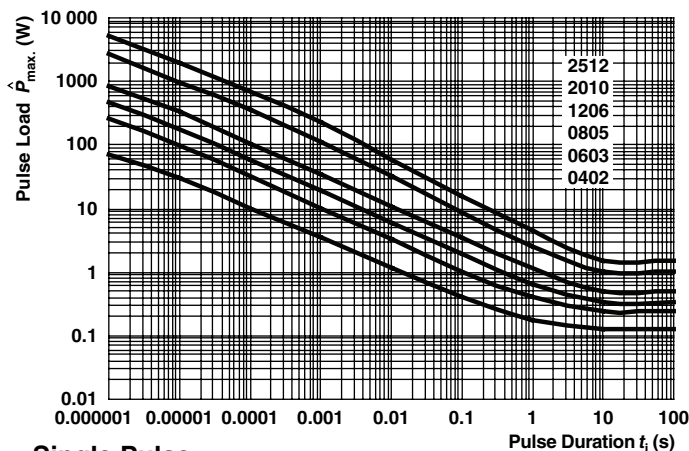
CRCW0603-HP	100	562R	1 %	ET1	e3
MODEL	TCR	RESISTANCE VALUE	TOLERANCE	PACKAGING ⁽²⁾	LEAD (Pb)-FREE
CRCW0402-HP CRCW0603-HP CRCW0805-HP CRCW1206-HP CRCW2010-HP CRCW2512-HP	± 100 ppm/K ± 200 ppm/K	10R = 10 Ω 562R = 562 Ω 10K = 10 kΩ 1M = 1 MΩ 0R0 = Jumper	± 1 % ± 5 %	ET1 ET5 ET6 ET7 EF4 EG1 E20 E02 E67 E82	e3 = Pure tin termination finish

Notes⁽¹⁾ Preferred way for ordering products is by use of the PART NUMBER⁽²⁾ Please refer to table PACKAGING, see below**PACKAGING**

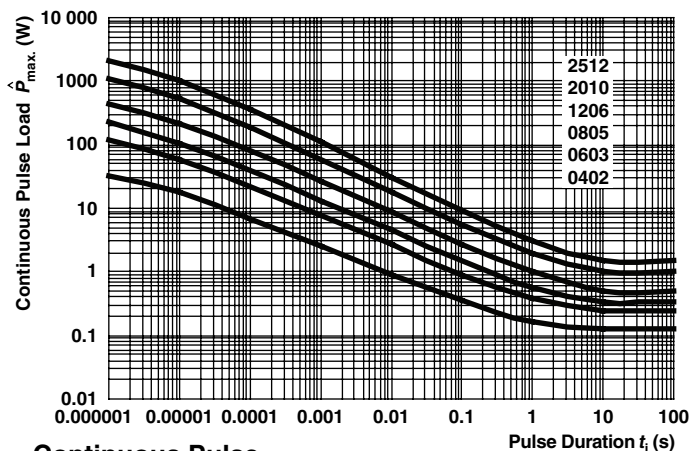
MODEL	REEL							
	TAPE WIDTH	DIAMETER	PITCH	PIECES/ REEL	PACKAGING CODE			
					PART NUMBER		PRODUCT DESC.	
					PAPER	BLISTER	PAPER	BLISTER
CRCW0402-HP	8 mm	180 mm/7" 330 mm/13"	2 mm 2 mm	10 000 50 000	ED EE		ET7 EF4	
CRCW0603-HP	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	EA EB EC	EI EL	ET1 ET5 ET6	EG1 E20
CRCW0805-HP	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	EA EB EC	EI EL	ET1 ET5 ET6	EG1 E20
CRCW1206-HP	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	EA EB EC	EI EL	ET1 ET5 ET6	EG1 E20
CRCW2010-HP	12 mm	180 mm/7"	4 mm	4000		EF		E02
CRCW2512-HP	12 mm	180 mm/7"	8 mm 4 mm	2000 4000		EG EH		E67 E82

DIMENSIONS in millimeters

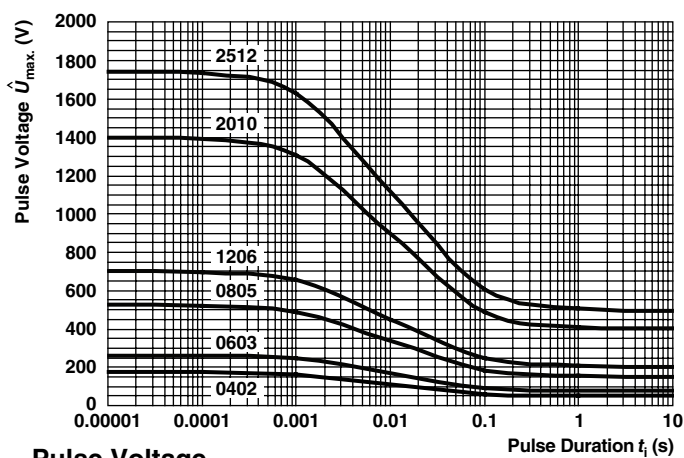
SIZE		RESISTANCE RANGE Ω	DIMENSIONS					SOLDER PAD DIMENSIONS					
								REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC		L	W	H	T1	T2	a	b	l	a	b	l
0402	1005	1R - 1M	1.0 ± 0.05	0.5 ± 0.05	0.3 ± 0.1	0.25 ± 0.1	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1R - 1M	1.6 ± 0.1	0.85 ± 0.1	0.45 ± 0.1	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	1R - 1M	2.0 ± 0.15	1.25 ± 0.15	0.50 ± 0.1	0.4 ± 0.2	0.35 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	1R - 1M	3.1 ± 0.2	1.6 ± 0.15	0.50 ± 0.15	0.5 ± 0.2	0.45 ± 0.2	0.9	1.7	2.0	1.1	1.7	2.3
2010	5025	1R - 1M	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	1R - 1M	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**Single Pulse**

Maximum pulse dissipation as a function of the pulse duration, single pulse for CRCW...-HP

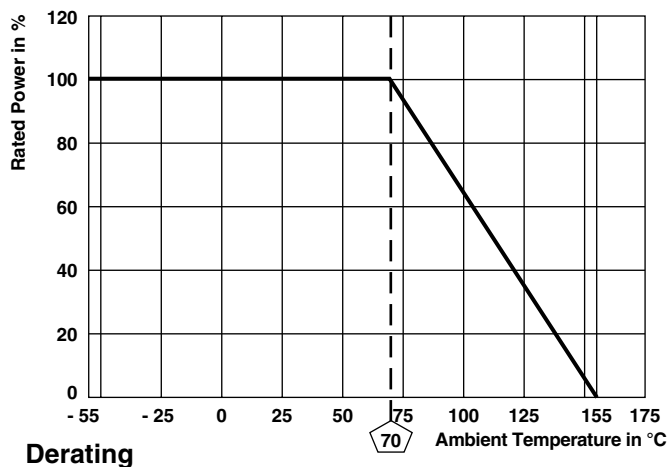
**Continuous Pulse**

Maximum pulse dissipation as a function of the pulse duration, continuous pulse for CRCW...-HP



Pulse Voltage

Maximum pulse voltage, single and continuous pulses; applicable if $\hat{P} \leq \hat{P}_{max}$; for permissible resistance change equivalent to 8000 h operation



Derating

TEST PROCEDURES AND REQUIREMENTS

EN 60115-1

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

APPLICABLE SPECIFICATIONS

- EN 60115-1 Generic specification
- AEC-Q200 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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