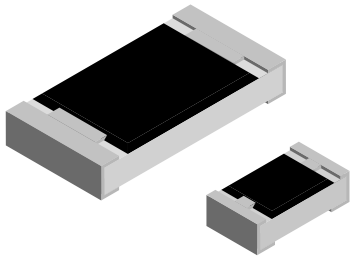
Pulse Proof, High Power Thick Film Chip Resistors



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
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 2.5 A					
CRCW0603-HP e3	0603	1608	0.25	75	± 100	± 1	1R to 1M	E24 + E96
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 4 A					
CRCW0805-HP e3	0805	2012	0.33	150	± 100	± 1	1R to 1M	E24 + E96
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 5 A					
CRCW1206-HP e3	1206	3216	0.5	200	± 100	± 1	1R to 1M	E24 + E96
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 6 A					
CRCW2010-HP e3	2010	5025	1.0	400	± 100	± 1	1R to 1M	E24 + E96
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 10 A					
CRCW2512-HP e3	2512	6332	1.5	500	± 100	± 1	1R to 1M	E24 + E96
					± 200	± 5		E24
			Zero-Ohm-Resistor: $R_{max.}$ = 0.010 Ω, $I_{max.}$ = 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 $U_{max.}$ AC/DC	V	50	75	150	200	400	500
Insulation Voltage $U_{ins.}$ (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 °C is not exceeded.

For technical questions, contact: thickfilmchip@vishay.com
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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

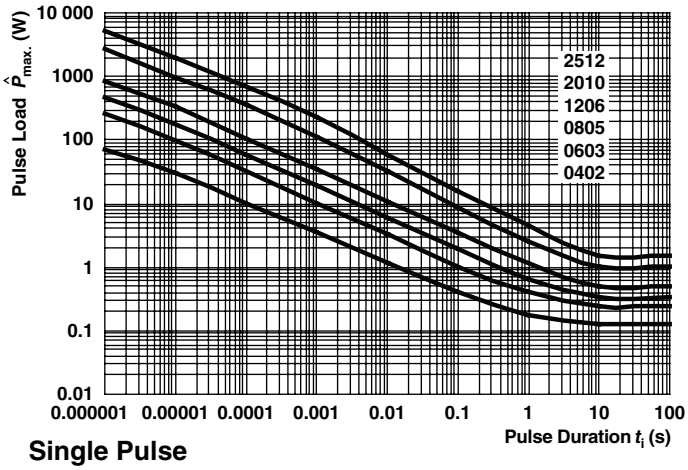
PACKAGING

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

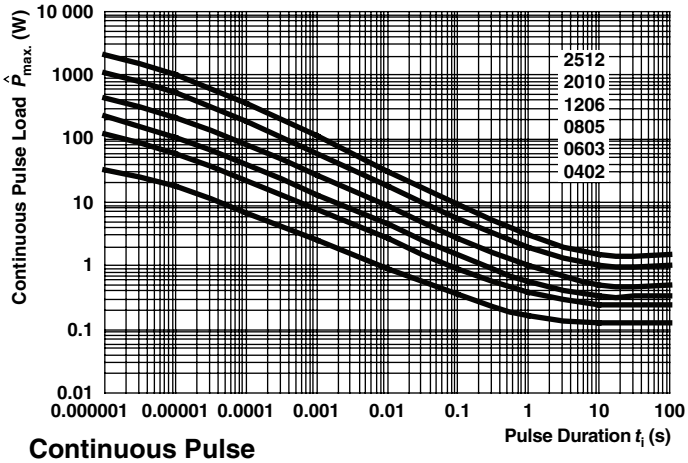
SIZE		RESISTANCE RANGE Ω	DIMENSIONS					SOLDER PAD DIMENSIONS					
								REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC		L	W	H	T1	T2	a	b	l	a	b	l
0402	1005	1R - 1M	1.0 ± 0.05	0.5 ± 0.05	0.3 ± 0.1	0.25 ± 0.1	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1R - 1M	1.6 ± 0.1	0.85 ± 0.1	0.45 ± 0.1	0.3 ± 0.2	0.3 ± 0.2	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



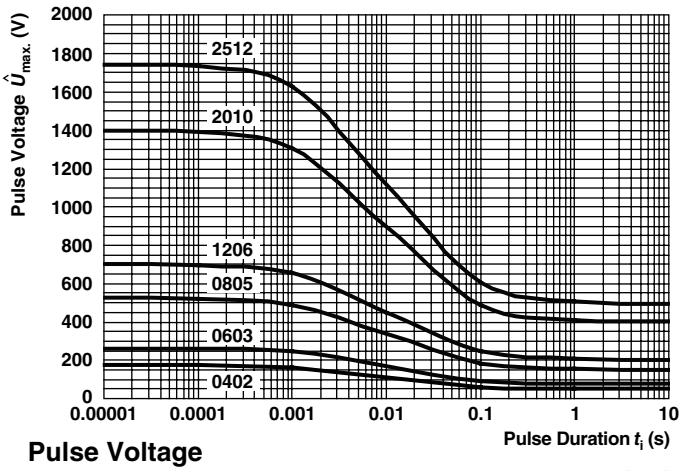
Single Pulse

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



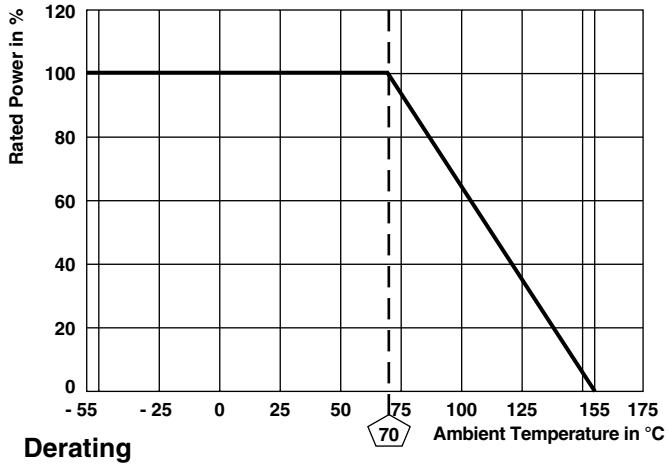
Continuous Pulse

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 MΩ
	CRCW....-HP e3	
Resistance (4.5)	-	± 1 %, ± 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	± (0.5 % R + 0.05 Ω)
Solderability (4.17.5)	Aging 4 h at 155 °C, dryheat Solder bath method; 235 °C; 2 s Visual examination	Good tinning (≥ 95 % covered) no visible damage
Resistance to soldering heat (4.18.2)	Solder bath method; (260 ± 5) °C; (10 ± 1) s	± (1 % R + 0.05 Ω)
Rapid change of temperature (4.19)	30 min at LCT = - 55 °C; 30 min at UCT = 125 °C; 5 cycles	± (1 % R + 0.05 Ω)
Damp heat, steady state (4.24)	(40 ± 2) °C; 56 days; (93 ± 3) % RH	± (2 % R + 0.05 Ω)
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	± (2 % R + 0.05 Ω)
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	± (2 % R + 0.05 Ω)
Endurance at upper category temperature (4.25.3)	UCT = 155 °C; 1000 h	± (2 % R + 0.05 Ω)

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

Disclaimer

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

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