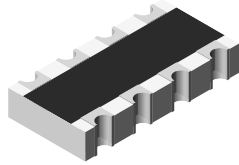


## Thick Film Chip Resistor Array



The CRA04P thick film resistor array is constructed on a high grade ceramic body with concave terminations. A small package enables the design of high density circuits. The single component reduces board space, component counts and assembly costs.

### FEATURES

- Concave terminal array with square corners
- Wide ohmic range: 1R0 to 1M0
- 8 terminal package with isolated resistors
- Pure tin solder contacts on Ni barrier layer, provides compatibility with lead (Pb)-free and lead containing soldering processes
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

STANDARD ELECTRICAL SPECIFICATIONS							
MODEL	CIRCUIT	POWER RATING $P_{70\text{ }^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V $\cong$	TEMPERATURE COEFFICIENT $\pm$ ppm/K	TOLERANCE $\pm$ %	RESISTANCE RANGE $\Omega$	E-SERIES
CRA04P	03	0.063	50	100	2	10 to 1M	24
				200	5	1 to 1M	24
Zero-Ohm-Resistor: $R_{\text{max.}} = 50\text{ m}\Omega$ , $I_{\text{max.}} = 1\text{ A}$							

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	CRA04P
Rated dissipation $P_{70}$ <sup>(1)</sup>	W per element	0.063
Limiting element voltage $U_{\text{max. AC/DC}}$	V	50
Insulation voltage $U_{\text{ins}}$ (1 min)	V	100
Insulation resistance	$\Omega$	$> 10^9$
Category temperature range	$^\circ\text{C}$	- 55 to + 155

#### Note

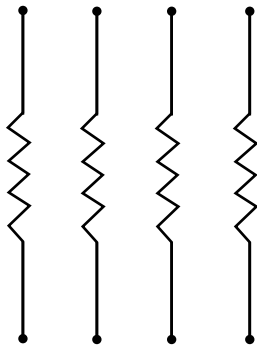
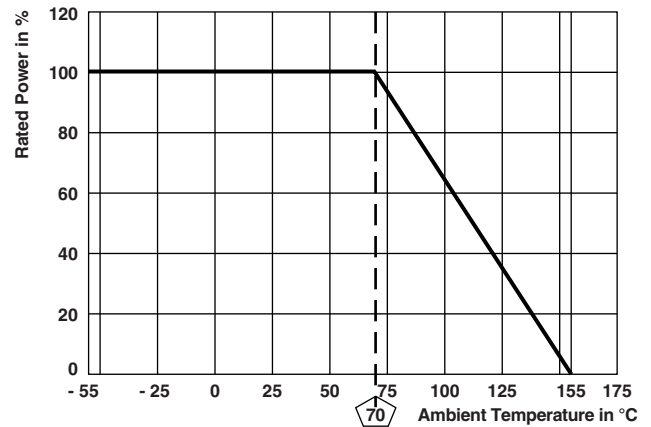
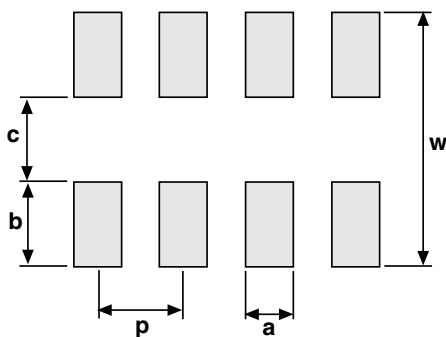
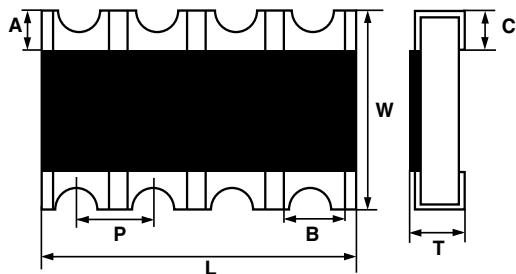
<sup>(1)</sup> Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

PART NUMBER AND PRODUCT DESCRIPTION																	
Part Number: CRA04P08347K0JTD <sup>(2)</sup>																	
C	R	A	0	4	P	0	8	3	4	7	K	0	J	T	D		
MODEL	TERMINAL STYLE	PIN	CIRCUIT	VALUE	TOLERANCE	PACKAGING <sup>(3)</sup>	SPECIAL										
CRA04	P	08	3 = 03	R = Decimal K = Thousand M = Million 0000 = 0 $\Omega$ Jumper	G = $\pm 2\%$ J = $\pm 5\%$ Z = 0 $\Omega$ Jumper	TD TC PZ	Up to 2 digits										
Product Description: CRA04P 08 03 47K 5% RT7 e3																	
CRA04P	08	03	47K	5%	RT7	e3											
MODEL	TERMINAL COUNT	CIRCUIT TYPE	RESISTANCE VALUE	TOLERANCE	PACKAGING <sup>(3)</sup>	LEAD (Pb)-FREE											
CRA04P	08	03	10R = 10 $\Omega$ 47K = 47 $\Omega$ 1M = 1 M $\Omega$ OR0 = 0 $\Omega$ Jumper	$\pm 2\%$ $\pm 5\%$	RT7 RT6 PZ	e3 = Pure tin termination finish											

#### Notes

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

PACKAGING						
MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/REEL	PACKAGING CODE	
					PAPER TAPE	
					PART NUMBER	PRODUCT DESCRIPTION
CRA04P	8 mm	180 mm/7"	2 mm	10 000	TD	RT7
		330 mm/13"	2 mm	20 000	TC	RT6
		330 mm/13"	2 mm	50 000	PZ	PZ

**CIRCUIT**
**03 Circuit**

**DERATING**

**DIMENSIONS**


PIN NO#	DIMENSIONS in millimeters						
	L	A	B	C	P <sub>NOM.</sub>	T	W
8	2.00	0.20	0.32	0.25	0.50	0.45	1.00
TOL.	± 0.20	± 0.10	± 0.10	± 0.15	-	± 0.10	± 0.10

SOLDER PAD DIMENSIONS in millimeters					
	c	w	p	a	b
WAVE	0.5	1.5	0.5	0.32	0.5



TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ ) <sup>(1)</sup>	
				STABILITY CLASS 2 OR BETTER	
			Stability for product type:	10 $\Omega$ to 1 M $\Omega$	1 $\Omega$ to 1 M $\Omega$
			<b>CRA04P</b>		
4.5	-	Resistance	-	$\pm 2\%$	$\pm 5\%$
4.7	-	Voltage proof	$U = 1.4 \times U_{ins}$ ; 60 s	No flashover or breakdown	
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max}$ ; Duration according to style	$\pm (0.5\% R + 0.05 \Omega)$	
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40; non-activated flux; (235 $\pm$ 5) $^{\circ}$ C; (2 $\pm$ 0.2) s	Good tinning ( $\geq 95\%$ covered) no visible damage	
			Solder bath method; Sn96.5Ag3Cu0.5; non-activated flux; (245 $\pm$ 5) $^{\circ}$ C; (3 $\pm$ 0.3) s	Good tinning ( $\geq 95\%$ covered) no visible damage	
4.8.4.2	-	Temperature coefficient	(20/- 55/20) $^{\circ}$ C and (20/125/20) $^{\circ}$ C	$\pm 100$ ppm/K	$\pm 200$ ppm/K
4.32	21 (U <sub>J3</sub> )	Shear (adhesion)	45 N	No visible damage	
4.33	21 (U <sub>J1</sub> )	Substrate bending	Depth 2 mm; 3 times	No visible damage, no open circuit in bent position $\pm (0.25\% R + 0.05 \Omega)$	
4.19	14 (Na)	Rapid change of temperature	30 min. at - 55 $^{\circ}$ C; 30 min at 125 $^{\circ}$ C 5 cycles 1000 cycles	$\pm (0.5\% R + 0.05 \Omega)$ $\pm (1\% R + 0.05 \Omega)$	
4.23	-	Dry heat	-	$\pm (2\% R + 0.05 \Omega)$	
4.23.2	2 (Ba)	Damp heat, cyclic	125 $^{\circ}$ C; 16 h		
4.23.3	30 (Db)	Cold	55 $^{\circ}$ C; $\geq 90\%$ RH; 24 h; 1 cycle		
4.23.4	1 (Aa)	Low air pressure	- 55 $^{\circ}$ C; 2 h		
4.23.5	13 (M)	-	1 kPa; (25 $\pm$ 10) $^{\circ}$ C; 1 h		
4.23.6	30 (Db)	Damp heat, cyclic	55 $^{\circ}$ C; $\geq 90\%$ RH; 24 h; 5 cycle		
4.23.7	-	D.C. load	$U = \sqrt{P_{70} \times R}$		
4.25.1	-	Endurance at 70 $^{\circ}$ C	$U = \sqrt{P_{70} \times R} \leq U_{max}$ . 1.5 h on; 0.5 h off; 70 $^{\circ}$ C; 1000 h 70 $^{\circ}$ C; 8000 h	$\pm (2\% R + 0.1 \Omega)$ $\pm (4\% R + 0.1 \Omega)$	
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method; (260 $\pm$ 5) $^{\circ}$ C; (10 $\pm$ 1) s	$\pm (0.5\% R + 0.05 \Omega)$	
4.35	-	Flammability, needle flame test	IEC 60695-11-5; 10 s	No burning after 30 s	
4.24	78 (Cab)	Damp heat, steady state	(40 $\pm$ 2) $^{\circ}$ C; (93 $\pm$ 3) % RH; 56 days	$\pm (1\% R + 0.05 \Omega)$	
4.25.3	-	Endurance at upper category temperature	155 $^{\circ}$ C; 1000 h	$\pm (2\% R + 0.1 \Omega)$	
4.40	-	Electrostatic discharge (human body model)	IEC 61340-3-1; 3 positive and 3 negative discharges; ESD voltage according to style	$\pm (1\% R + 0.05 \Omega)$	
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 $^{\circ}$ C; method 2	No visible damage	
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 $^{\circ}$ 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 <sup>2</sup> ; 10 sweeps per axis	$\pm (0.5\% R + 0.05 \Omega)$	
4.37	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R} \leq 2 \times U_{max}$ . 0.1 s on; 2.5 s off; 1000 cycles	$\pm (1\% R + 0.05 \Omega)$	
4.27	-	Single pulse high voltage overload, 10 $\mu$ s/700 $\mu$ s	$\dot{U} = 10 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max}$ . 10 pulses	$\pm (1\% R + 0.05 \Omega)$	

**Note**

<sup>(1)</sup> Figures are given for a single element.

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, environmental test procedures

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



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