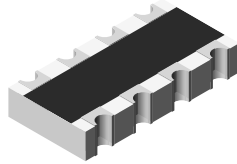


Thick Film, Resistor Array



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
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	CIRCUIT	POWER RATING $P_{70\text{ }^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V_{\equiv}	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
CRA04P	03	0.063	50	± 100	± 2	10R to 1M0	24
				± 200	± 5	1R0 to 1M0	24
Zero-Ohm-Resistor: $R_{\text{max.}} = 50\text{ m}\Omega$, $I_{\text{max.}} = 1\text{ A}$							

TECHNICAL SPECIFICATIONS

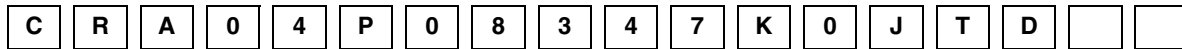
PARAMETER	UNIT	CRA04P
Rated Dissipation P_{70} ⁽¹⁾	W per element	0.063
Limiting Element Voltage $U_{\text{max.}}$ AC/DC	V	50
Insulation Voltage U_{ins} (1 min)	V	100
Insulation Resistance	Ω	$> 10^9$
Category Temperature Range	$^\circ\text{C}$	- 55 to + 155

Note

⁽¹⁾ 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 ⁽¹⁾



MODEL	TERMINAL STYLE	PIN	CIRCUIT	VALUE	TOLERANCE	PACKAGING ⁽²⁾	SPECIAL
CRA04	P	08	3 = 03	R = Decimal K = Thousand M = Million 0000 = 0 Ω Jumper	G = $\pm 2\%$ J = $\pm 5\%$ Z = 0 Ω 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 ⁽²⁾	LEAD (Pb)-FREE
CRA04P	08	03	10R = 10 Ω 47K = 47 k Ω 1M = 1 M Ω 0R0 = Jumper	$\pm 2\%$ $\pm 5\%$	RT7 RT6 PZ	e3 = Pure tin Termination finish

Notes

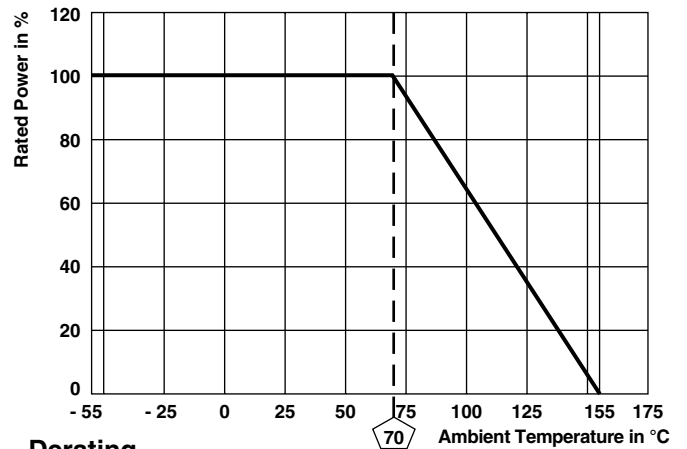
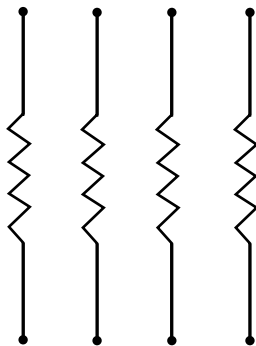
⁽¹⁾ Preferred way for ordering products is by use of the PART NUMBER

⁽²⁾ Please refer to the table PACKAGING, see next page

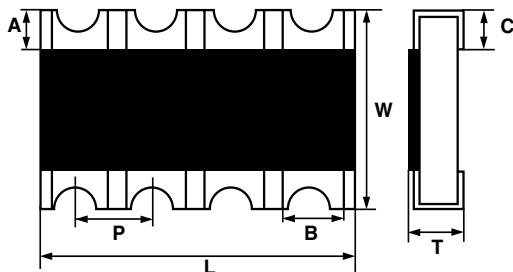
PACKAGING						
MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/REEL	PACKAGING CODE	
					PAPER TAPE	
					PART NUMBER	PRODUCT DESCRIPTION
CRA04P	8 mm	180 mm/7"	2 mm	10 000	TD	RT7
		330 mm/13"	2 mm	20 000	TC	RT6
		330 mm/13"	2 mm	50 000	PZ	PZ

CIRCUIT

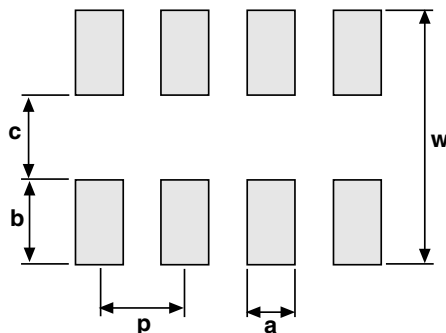
03 Circuit



DIMENSIONS



PIN NO#	DIMENSIONS (in millimeters)						
	L	A	B	C	P _{NOM}	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 (ΔR) ⁽¹⁾
				STABILITY CLASS 2 OR BETTER
			Stability for product type:	
			CRA04P	10 Ω to 1 M Ω 1 Ω to 1 M Ω
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	± 100 ppm/K ± 200 ppm/K
4.32	21 (U ₀₃)	Shear (adhesion)	45 N	No visible damage
4.33	21 (U ₁₁)	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 ² ; 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 μ s/700 μ s	$\dot{U} = 10 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max}$. 10 pulses	$\pm (1\% R + 0.05 \Omega)$

Note

⁽¹⁾ 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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