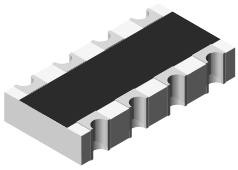
Thick Film Chip Resistor Array



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

RoHS COMPLIANT
HALOGEN FREE

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	CIRCUIT	POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE MAX. V≅	TEMPERATURE COEFFICIENT ± ppm/K	TOLERANCE ± %	RESISTANCE RANGE Ω	E-SERIES
CRA04P	03	0.063	50	100	2	10 to 1M	24
				200	5	1 to 1M	24
		Zero-Ohm-Resistor: $R_{max.}$ = 50 mΩ, $I_{max.}$ = 1 A					

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRA04P
Rated dissipation P_{70} (1)	W per element	0.063
Limiting element voltage $U_{max.}$ AC/DC	V	50
Insulation voltage U_{ins} (1 min)	V	100
Insulation resistance	Ω	> 10^9
Category temperature range	°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)

C	R	A	0	4	P	0	8	3	4	7	K	0	J	T	D		

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** = ± 2 % **J** = ± 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 (3)	LEAD (Pb)-FREE
CRA04P	**08**	**03**	**10R** = 10 Ω **47K** = 47 Ω **1M** = 1 MΩ **0R0** = 0 Ω jumper	**± 2 %** **± 5 %**	**RT7** **RT6** **PZ**	**e3** = pure tin termination finish

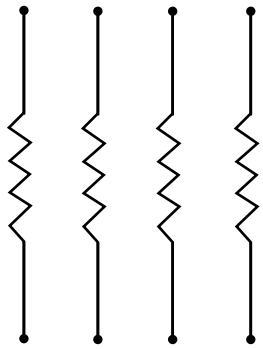
Notes

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

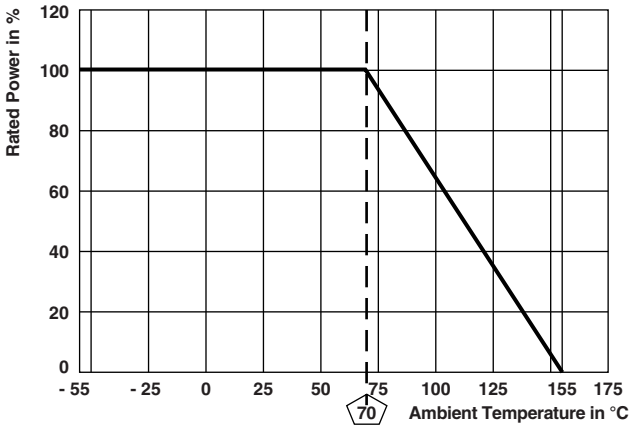
PACKAGING						
MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/REEL	PACKAGING CODE	
					PAPER TAPE	
					PART NUMBER	PRODUCT DESCRIPTION
CRA04P	8 mm	180 mm/7"	2 mm	10 000	TD	RT7
		330 mm/13"	2 mm	20 000	TC	RT6
		330 mm/13"	2 mm	50 000	PZ	PZ

CIRCUIT

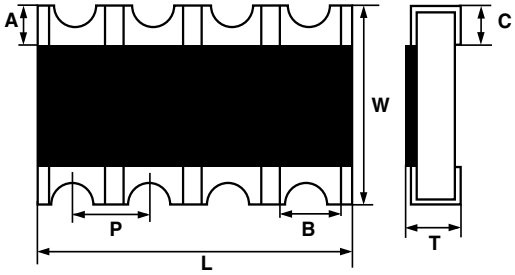
03 Circuit



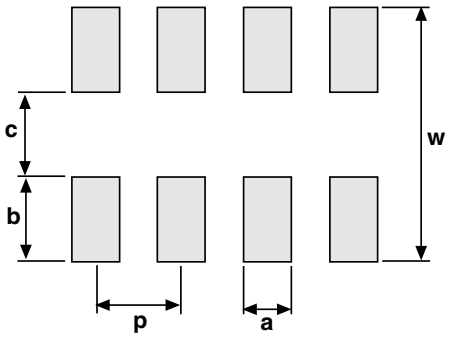
DERATING



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 MΩ	1 Ω to 1 MΩ
4.5	-	Resistance	-	± 2 %	± 5 %
4.7	-	Voltage proof	U = 1.4 x U_{ins}; 60 s	No flashover or breakdown	
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70} \times R}$ ≤ 2 × $U_{max.}$; Duration according to style	± (0.5 % R + 0.05 Ω)	
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40; non-activated flux; (235 ± 5) °C; (2 ± 0.2) s	Good tinning (≥ 95 % covered) no visible damage	
			Solder bath method; Sn96.5Ag3Cu0.5; non-activated flux; (245 ± 5) °C; (3 ± 0.3) s	Good tinning (≥ 95 % covered) no visible damage	
4.8.4.2	-	Temperature coefficient	(20/- 55/20) °C and (20/125/20) °C	± 100 ppm/K	± 200 ppm/K
4.32	21 (U_{U3})	Shear (adhesion)	45 N	No visible damage	
4.33	21 (U_{U1})	Substrate bending	Depth 2 mm; 3 times	No visible damage, no open circuit in bent position ± (0.25 % R + 0.05 Ω)	
4.19	14 (Na)	Rapid change of temperature	30 min. at - 55 °C; 30 min at 125 °C 5 cycles 1000 cycles	± (0.5 % R + 0.05 Ω) ± (1 % R + 0.05 Ω)	
4.23	-	Dry heat	-	± (2 % R + 0.05 Ω)	
4.23.2	2 (Ba)	Damp heat, cyclic	125 °C; 16 h		
4.23.3	30 (Db)	Cold	55 °C; ≥ 90 % RH; 24 h; 1 cycle		
4.23.4	1 (Aa)	Low air pressure	- 55 °C; 2 h		
4.23.5	13 (M)	-	1 kPa; (25 ± 10) °C; 1 h		
4.23.6	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 5 cycle		
4.23.7	-	D.C. load	$U = \sqrt{P_{70} \times R}$		
4.25.1	-	Endurance at 70 °C	$U = \sqrt{P_{70} \times R} \leq U_{max.}$ 1.5 h on; 0.5 h off; 70 °C; 1000 h 70 °C; 8000 h	± (2 % R + 0.1 Ω) ± (4 % R + 0.1 Ω)	
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method; (260 ± 5) °C; (10 ± 1) s	± (0.5 % R + 0.05 Ω)	
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 ± 2) °C; (93 ± 3) % RH; 56 days	± (1 % R + 0.05 Ω)	
4.25.3	-	Endurance at upper category temperature	155 °C; 1000 h	± (2 % R + 0.1 Ω)	
4.40	-	Electrostatic discharge (human body model)	IEC 61340-3-1; 3 positive and 3 negative discharges; ESD voltage according to style	± (1 % R + 0.05 Ω)	
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 °C; method 2	No visible damage	
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 °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 ≤ 1.5 mm; A ≤ 200 m/s^2; 10 sweeps per axis	± (0.5 % R + 0.05 Ω)	
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	± (1 % R + 0.05 Ω)	
4.27	-	Single pulse high voltage overload, 10 µs/700 µs	$\hat{U} = 10 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$ 10 pulses	± (1 % R + 0.05 Ω)	

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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