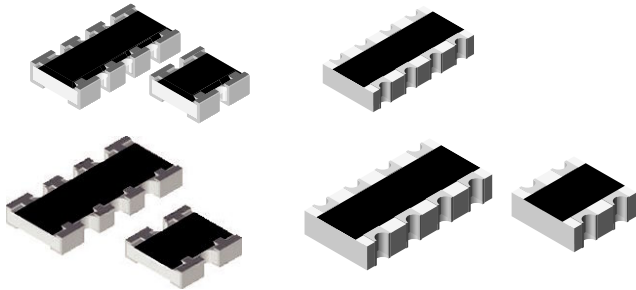


Thick Film Commodity Resistor Array



FEATURES

- High volume product suitable for commercial applications
- Convex or concave terminal array with square corners
- 4 or 8 terminal package with isolated resistors
- Pure tin solder contacts on Ni barrier layer provides compatibility with lead (Pb)-free and lead containing processes
- Compliant to RoHS Directive 2011/65/EU
- Halogen-free according to IEC 61249-2-21



RoHS
COMPLIANT
HALOGEN
FREE

STANDARD ELECTRICAL SPECIFICATIONS							
MODEL	CIRCUIT	POWER RATING P_{70} W	LIMITING ELEMENT VOLTAGE MAX. $U_{max. AC_{RMS}/DC}$	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	SERIES
CRA04S CRA04P	03	0.063	50	± 100 ± 200	± 1 $\pm 2; \pm 5$	10R to 1M	E24; E96
							E24
Zero-Ohm-Resistor available; $R_{max.} = 50 \text{ m}\Omega$, $I_{max.} = 1 \text{ A}$							
CRA06S CRA06P	03	0.063	50	± 100 ± 200	± 1 $\pm 2; \pm 5$	10R to 1M	E24; E96
							E24
Zero-Ohm-Resistor available; $R_{max.} = 50 \text{ m}\Omega$, $I_{max.} = 1 \text{ A}$							

Notes

- These resistors do not feature a lifetime limitation when operated within the limits of rated dissipation, permissible operating voltage and permissible film temperature. However, the resistance typically increases due to the resistor's film temperature over operating time, generally known as drift. The drift may exceed the stability requirements of an individual application circuit and thereby limits the functional lifetime.
- Marking: See data sheet "Surface Mount Resistor Marking" (www.vishay.com/doc?20020)
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

TECHNICAL SPECIFICATIONS			
PARAMETER	UNIT	CRA04	CRA06
Power rating P_{70} ⁽¹⁾	W per element	0.063	
Limiting element voltage $U_{max. AC_{RMS}/DC}$	V	50	
Insulation voltage $U_{ins.}$ (1 min)	V	> 100	
Insulation resistance	Ω	> 10^9	
Operating temperature range	$^{\circ}\text{C}$	- 55 to + 155	

Note

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

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: CRA06S08347K0JTABC

C	R	A	0	6	S	0	8	3	4	7	K	0	J	T	A	B	C
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MODEL	TERMINAL STYLE	PIN	CIRCUIT	RESISTANCE	TOLERANCE	PACKAGING	SPECIAL
CRA04 CRA06	S = Convex P = Concave	04 08	3 = 03	R = Decimal K = Thousand M = Million 0000 = 0 Ω jumper	F = ± 1 % G = ± 2 % J = ± 5 % Z = 0 Ω Jumper	TA TC TD	BC = Commodity

Product Description: CRA06S-BC 08 03 47K 5 % RT1 e3

MODEL	PIN	CIRCUIT TYPE	RESISTANCE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE
CRA04S-BC CRA04P-BC CRA06S-BC CRA06P-BC	04 08	03	10R = 10 Ω 47K = 47 kΩ 1M = 1 MΩ ORO = Jumper	± 1 % ± 2 % ± 5 %	RT1 RT2 RT3 RT5 RT6 RT7	e3 = Pure tin termination finish

AVAILABLE TYPES AND RANGES

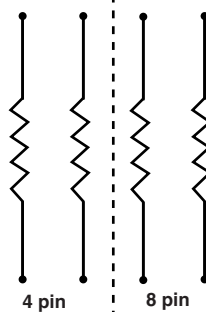
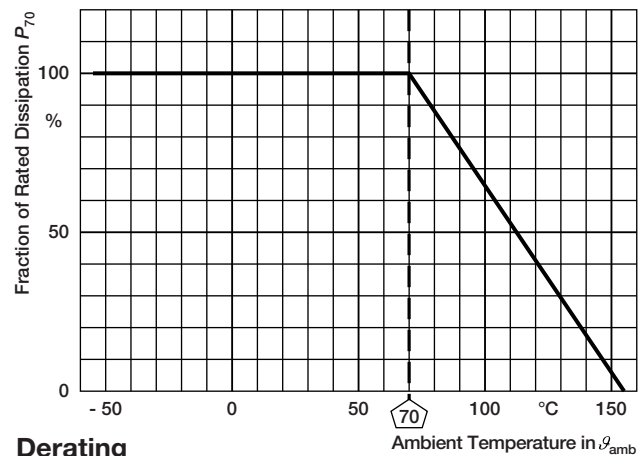
MODEL	TERMINAL COUNT	CIRCUIT	TEMPERATURE COEFFICIENT	TOLERANCE
CRA04S	04	03	± 100 ppm/K	± 1 %
	08		± 200 ppm/K	± 2 %, ± 5 %
CRA04P	08		± 100 ppm/K	± 1 %
			± 200 ppm/K	± 2 %, ± 5 %
CRA06S CRA06P	04		± 100 ppm/K	± 1 %
	08		± 200 ppm/K	± 2 %, ± 5 %

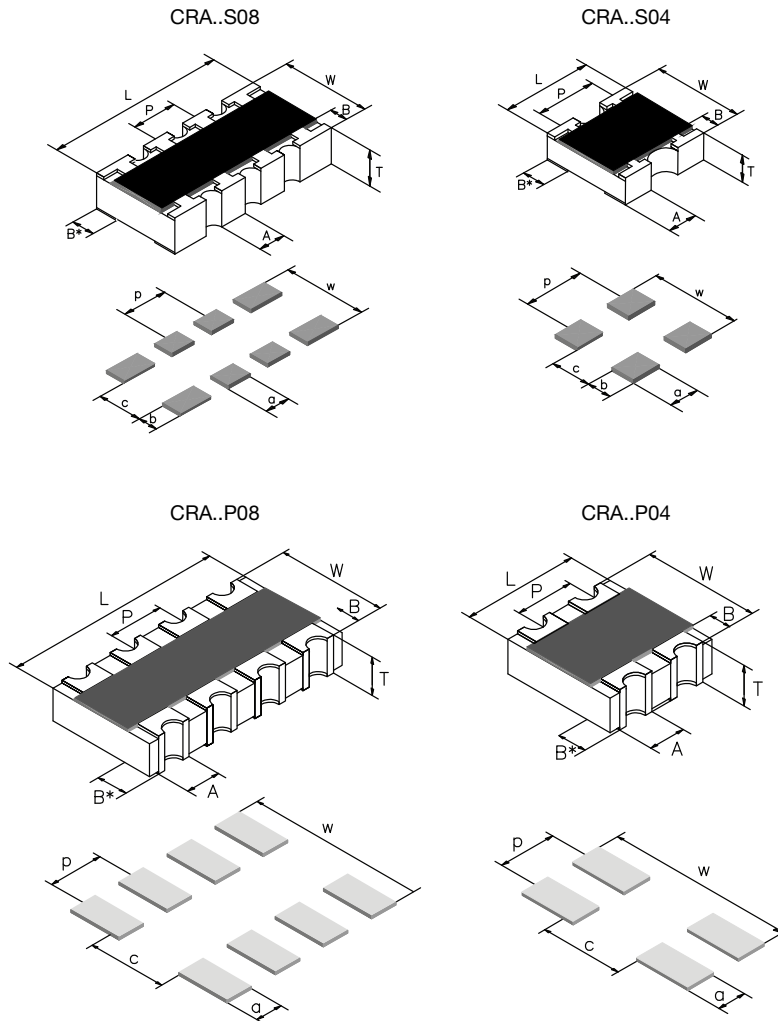
PACKAGING

MODEL	UNIT	PAPER TAPE ON REEL ACC. TO IEC 60286-3, TYPE I		
		QUANTITY	PART NUMBER	PRODUCT DESC.
CRA04S CRA04P	180 mm/7"	10 000	TD	RT7
	254 mm/10"	20 000	TI	RT2
	330 mm/13"	30 000	TL	RT3
CRA06 CRA06P	180 mm/7"	5000	TA	RT1
	254 mm/10"	10 000	TB	RT5
	330 mm/13"	20 000	TC	RT6

CIRCUIT

03 CIRCUIT


DERATING


DIMENSIONS


MODEL	PIN #	DIMENSIONS in millimeters						
		L	W	H	B	B*	A	P
CRA04S	4	1 ± 0.1	1 ± 0.1	0.3 ± 0.05	0.15 ± 0.1	0.25 ± 0.1	0.33 ± 0.1	0.67
	8	2 ± 0.1	1 ± 0.1	0.4 ± 0.1	0.2 ± 0.1	0.25 ± 0.1	0.3 ± 0.1	0.50
CRA04P	8	2 ± 0.1	1 ± 0.1	0.4 ± 0.1	0.15 ± 0.1	0.25 ± 0.1	0.3 ± 0.1	0.50
CRA06S	4	1.6 ± 0.15	1.6 ± 0.15	0.45 ± 0.1	0.3 ± 0.15	0.3 ± 0.15	0.6 ± 0.1	0.80
	8	3.2 ± 0.2	1.6 ± 0.15	0.5 ± 0.1	0.3 ± 0.15	0.3 ± 0.15	0.5 ± 0.1	0.80
CRA06P	4	1.6 ± 0.15	1.6 ± 0.15	0.55 ± 0.1	0.3 ± 0.15	0.4 ± 0.15	0.5 ± 0.1	0.80
	8	3.2 ± 0.15	1.6 ± 0.15	0.55 ± 0.1	0.35 ± 0.15	0.45 ± 0.15	0.5 ± 0.1	0.80

MODEL	PINS	RECOMMENDED SOLDER PAD DIMENSIONS in millimeters				
		c	w	p	a	b
CRA04S	4	0.5	2.0	0.67	0.33	0.34
	8	0.5	2.0	0.5	0.28	0.22
CRA04P	8	0.5	2.0	0.5	0.28	0.22
CRA06S	4	1.0	2.6	0.8	0.4	0.4
	8	1.0	2.6	0.8	0.4	0.4
CRA06P	4	1.0	2.6	0.8	0.4	0.4
	8	1.0	2.6	0.8	0.4	0.4

TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (ΔR)	
				STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER
			Stability for product types: CRA04S, CRA04P CRA06S, CRA06P	10 Ω to 1 M Ω	
4.5	-	Resistance	-	$\pm 1 \%$	$\pm 2 \%$; $\pm 5 \%$
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$; duration acc. to style	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.05 \Omega)$
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40 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 $^{\circ}$ C, - 55 $^{\circ}$ C, 20 $^{\circ}$ C and 20 $^{\circ}$ C, 125 $^{\circ}$ C, 20 $^{\circ}$ C	± 100 ppm/K	± 200 ppm/K
4.32	21 (Ue)	Shear (adhesion)	20 N	No visible damage	
4.33	21 (Ue)	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 4.23.2 4.23.3	- 2 (Ba) 30 (Db)	Climatic sequence Dry heat Damp heat, cyclic	- 125 $^{\circ}$ C; 16 h 55 $^{\circ}$ C; $\geq 90 \%$ RH 24 h; 1 cycle	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
4.23.4 4.23.5 4.23.6	1 (Aa) 13 (M) 30 (Db)	Cold Low air pressure Damp heat, cyclic	- 55 $^{\circ}$ C; 2 h 1 kPa; (25 \pm 10) $^{\circ}$ C; 1 h 55 $^{\circ}$ C; $\geq 90 \%$ RH 24 h; 5 cycle		
4.23.7	-		$U = (P_{70} \times R)^{1/2}$		
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		
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method; (260 \pm 5) $^{\circ}$ C; (10 \pm 1) s		
4.24	78 (Cab)	Damp heat, steady state	(40 \pm 2) $^{\circ}$ C; (93 \pm 3) % RH; 56 days	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
4.25.3	-	Endurance at upper category temperature	55 $^{\circ}$ C; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
4.40	-	Electrostatic discharge (human body model)	IEC 61340-3-1 3 pos. + 3 neg. discharges; ESD voltage acc. 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	

APPLICABLE SPECIFICATIONS	
• EN 60115-1	Generic specification
• EN 140400	Sectional specification
• EN 140401-802	Detail specification
• IEC 60068-2-x	Variety of environmental test procedures

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