

Thick Film Resistor Array



CRA06E and CRA06S Thick Film resistor arrays are constructed on a high grade ceramic body with convex terminations. A small package enables the design of high density circuits. The single component reduces board space, component counts and assembly costs.

FEATURES

- Convex terminal array available with either scalloped corners (E version) or square corners (S version)
- Wide ohmic range: 10R to 1M Ω
- 4 or 8 terminal package with isolated resistors
- Lead (Pb)-free solder contacts on Ni barrier layer
- Pure tin plating provides compatibility with Lead (Pb)-free and lead containing soldering processes
- Compatible with "Restriction of the use of Hazardous Substances" (RoHS) directive 2002/95/EC (issue 2004)



STANDARD ELECTRICAL SPECIFICATIONS

MODEL	CIRCUIT	POWER RATING $P_{70^{\circ}\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V_{Ξ}	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
CRA06E CRA06S	03	0.063	50	± 100 ± 200	± 1 $\pm 2; \pm 5$	10R - 1M Ω	24 + 96 24
Zero-Ohm-Resistor available; $R_{\text{max.}} = 50 \text{ m}\Omega$, $I_{\text{max.}} = 1 \text{ A}$							

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRA06E & S
Rated Dissipation at 70 °C ⁽²⁾	W per element	0.063
Limiting Element Voltage ⁽¹⁾	V_{Ξ}	50
Insulation Voltage (1 min)	$V_{\text{dc/ac peak}}$	100
Category Temperature Range	°C	- 55 to + 155
Insulation Resistance	Ω	$> 10^9$

Notes

⁽¹⁾ Rated voltage: $\sqrt{P \times R}$

⁽²⁾ 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 °C is not exceeded.

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: CRA06S08347K0JTA

PART NUMBER DECODE																																			
C		R		A		0		6		S		0		8		3		4		7		K		0		J		T		A					
MODEL		TERMINAL STYLE				PIN		CIRCUIT		VALUE				TOLERANCE				PACKAGING ⁽⁴⁾				SPECIAL													
CRA06		S E				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				Up to 2 digits													

PRODUCT DESCRIPTION: CRA06S 08 03 473 J RT1 e3

CRA06S	08	03	473	J	RT1	e3
MODEL	TERMINAL COUNT	CIRCUIT TYPE	RESISTANCE VALUE	TOLERANCE	PACKAGING ⁽⁴⁾	LEAD (Pb)-FREE
CRA06S CRA06E	04 08	03	473 = 47 k Ω 4702 = 47 k Ω 10R0 = 10 Ω 100 = 10 Ω 000 = 0 Ω Jumper First two digits (3 for 1 %) are significant. Last digit is the multiplier.	F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ Z = 0 Ω Jumper	RT1 RT6	e3 = Pure tin Termination finish

Notes

⁽³⁾ Preferred way for ordering products is by use of the PART NUMBER

⁽⁴⁾ Please refer to table PACKAGING, see next page

AVAILABLE TYPES AND RANGES

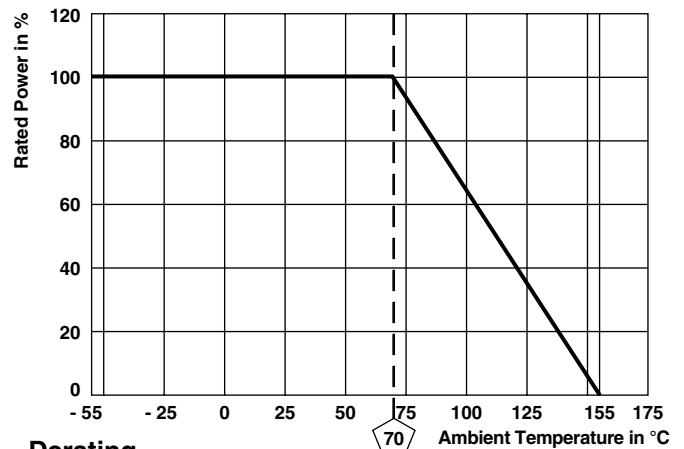
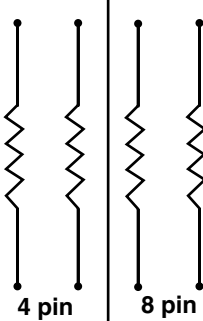
MODEL	TERMINAL COUNT	CIRCUIT	TEMPERATURE COEFFICIENT	TOLERANCE
CRA06S	04	03	± 100 ppm/K	$\pm 1\%$
			± 200 ppm/K	$\pm 5\%; \pm 2\%$
	08	03	± 100 ppm/K	$\pm 1\%$
			± 200 ppm/K	$\pm 5\%; \pm 2\%$
CRA06E	08	03	± 100 ppm/K	$\pm 1\%$
			± 200 ppm/K	$\pm 5\%; \pm 2\%$

PACKAGING

MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/REEL	PACKAGING CODE	
					PAPER TAPE	
					PART NUMBER	PRODUCT DESCRIPTION
CRA06	8 mm	180 mm/7"	4 mm	5000	TA	RT1
		330 mm/13"	4 mm	20 000	TC	RT6

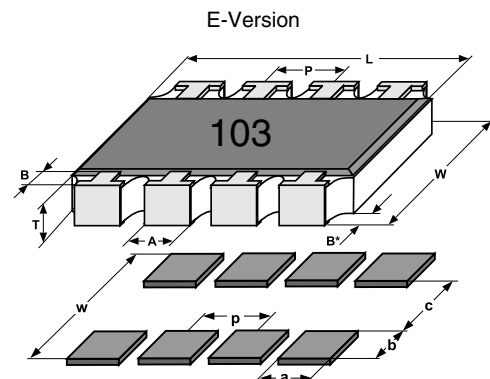
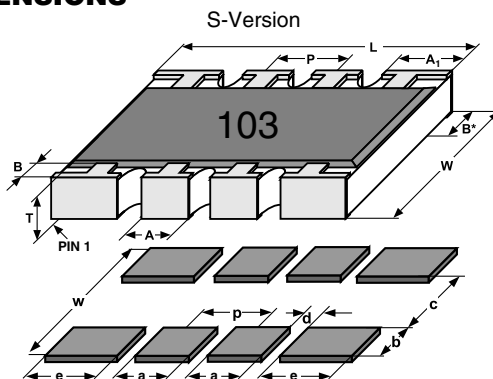
CIRCUIT

03 CIRCUIT



Derating

DIMENSIONS



MODEL	PIN NO#	DIMENSIONS [in millimeters]							
		L	A	A ₁	B	B*	P	T	W
CRA06S	4	1.6	0.38	0.61	0.3	0.3	0.8	0.5	1.5
CRA06E	8	3.2	0.38	-	0.3	0.3	0.8	0.5	1.5
CRA06S	8	3.2	0.38	0.61	0.3	0.3	0.8	0.5	1.5
	TOL.	± 0.15	± 0.15	± 0.15	± 0.15	± 0.15	± 0.1	± 0.1	± 0.15

SOLDER PAD DIMENSIONS [in millimeters]								
MODEL	PINS	c	w	d	p	a	b	e
CRA06S	4	0.8	3.1	0.36		0.44	1.15	
CRA06E CRA06S	8	0.8	3.1	0.36	0.8	0.44	1.15	0.63

TEST PROCEDURES AND REQUIREMENTS			
EN 60115-1			
TEST (clause)	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$) ⁽¹⁾	
		STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER
	Stability for product types: CRA06E/CRA06S	10 Ω to 1 M Ω	10 Ω to 1 M Ω
Resistance (4.5)	-	$\pm 1 \%$	$\pm 2 \%$; $\pm 5 \%$
Temperature coefficient (4.8.4.2)	20/- 55/20 °C and 20/125/20 °C	± 100 ppm/K	± 200 ppm/K
Overload (4.13)	$U = 2.5 \times (P_{70} \times R)^{1/2}$ $\leq 2 \times U_{\max.}$; 0.5 s	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
Solderability (4.17.5) ⁽²⁾	Aging 4 h at 155 °C, dryheat solder bath method; 235 °C; 2 s visual examination	Good tinning ($\geq 95 \%$ covered) no visible damage	
Resistance to soldering heat (4.18.2)	Solder bath method; (260 $\pm$ 5) °C; (10 $\pm$ 1) s	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
Rapid change of temperature (4.19)	30 min at LCT = - 55 °C; 30 min at UCT = 125 °C; 5 cycles	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
Damp heat, steady state (4.24)	(40 $\pm$ 2) °C; 56 days; (93 $\pm$ 3) % RH	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
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 $U = (P_{70} \times R)^{1/2}$ $U = U_{\max.}$; whichever is less severe	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
Endurance at 70 °C (4.25.1)	$U = (P_{70} \times R)^{1/2}$ $U = U_{\max.}$; whichever is less severe 1.5 h ON; 0.5 h OFF; 70 °C; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
Extended endurance (4.25.1.8)	Duration extended to 8000 h	$\pm (2 \% R + 0.1 \Omega)$	$\pm (4 \% R + 0.1 \Omega)$
Endurance at upper category temperature (4.25.3)	UCT = 125 °C; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$

Notes

⁽¹⁾ Figures are given for a single element

⁽²⁾ Solderability is specified for 2 years after production or requalification. Permitted storage time is 20 years

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
• EIA 481	Packaging of SMD components



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