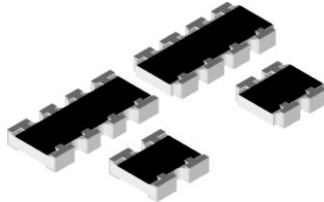


## Thick Film Resistor Array



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 $\Omega$
- 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. $V_{\equiv}$	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE $\Omega$	E-SERIES
CRA06E CRA06S	03	0.063	50	$\pm 100$ $\pm 200$	$\pm 1$ $\pm 2; \pm 5$	10R - 1M $\Omega$	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 <sup>(2)</sup>	W per element	0.063
Limiting Element Voltage <sup>(1)</sup>	$V_{\equiv}$	50
Insulation Voltage (1 min)	$V_{\text{dc/ac peak}}$	100
Category Temperature Range	$^\circ\text{C}$	- 55 to + 155
Insulation Resistance	$\Omega$	$> 10^9$

**Notes**

<sup>(1)</sup> Rated voltage:  $\sqrt{P \times R}$

<sup>(2)</sup> 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 rates dissipation applies only if the permitted film temperature of 155 °C is not exceed.

### PART NUMBER AND PRODUCT DESCRIPTION

**PART NUMBER: CRA06S08347K0JTA** <sup>(3)</sup>

C	R	A	0	6	S	0	8	3	4	7	K	0	J	T	A		
MODEL	TERMINAL STYLE	PIN	CIRCUIT	VALUE	TOLERANCE	PACKAGING <sup>(4)</sup>	SPECIAL										
CRA06	S E	04 08	3 = 03	R = Decimal K = Thousand M = Million 0000 = 0 $\Omega$ Jumper	F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ Z = 0 $\Omega$ 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 <sup>(4)</sup>	LEAD (Pb)-FREE										
CRA06S CRA06E	04 08	03	473 = 47 k $\Omega$ 4702 = 47 k $\Omega$ 10R0 = 10 $\Omega$ 100 = 10 $\Omega$ 000 = 0 $\Omega$ 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 $\Omega$ Jumper	RT1 RT6	e3 = Pure tin Termination finish										

**Notes**

<sup>(3)</sup> Preferred way for ordering products is by use of the PART NUMBER

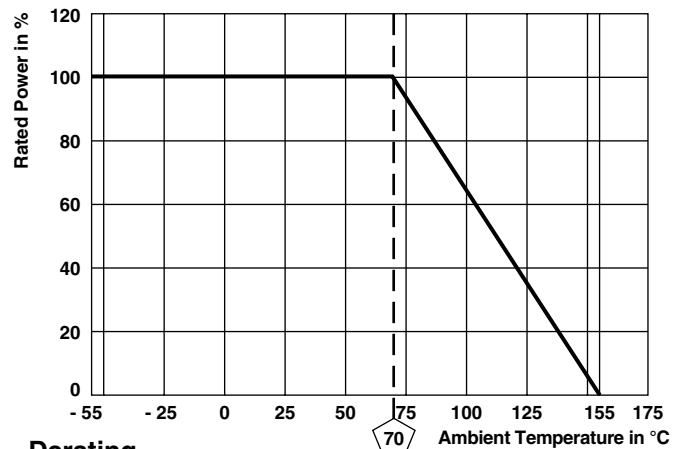
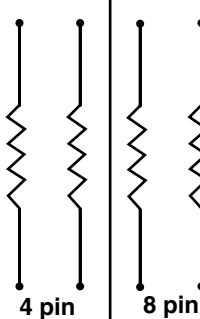
<sup>(4)</sup> Please refer to table PACKAGING, see next page

AVAILABLE TYPES AND RANGES				
MODEL	TERMINAL COUNT	CIRCUIT	TEMPERATURE COEFFICIENT	TOLERANCE
CRA06S	04	03	± 100 ppm/K	± 1 %
			± 200 ppm/K	± 5 %; ± 2 %
	08	03	± 100 ppm/K	± 1 %
			± 200 ppm/K	± 5 %; ± 2 %
CRA06E	08	03	± 100 ppm/K	± 1 %
			± 200 ppm/K	± 5 %; ± 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

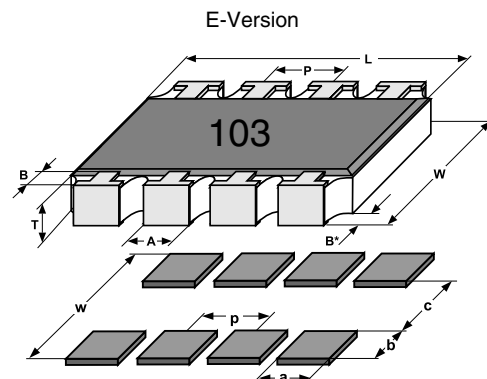
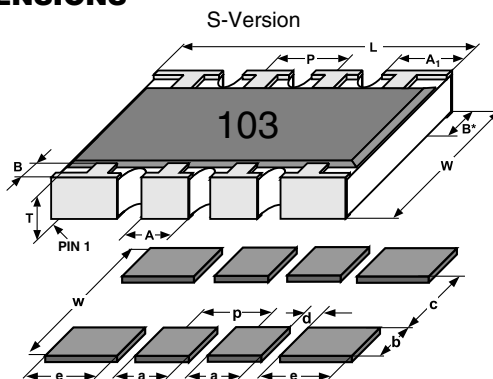
### CIRCUIT

03 CIRCUIT



Derating

### DIMENSIONS



MODEL	PIN NO#	DIMENSIONS [in millimeters]								
		L	A	A <sub>1</sub>	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

<b>TEST PROCEDURES AND REQUIREMENTS</b>			
EN 60115-1			
TEST (clause)	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R/R$ ) <sup>(1)</sup>	
		STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER
	Stability for product types: <b>CRA06E/CRA06S</b>	10 $\Omega$ to 1 M $\Omega$	10 $\Omega$ to 1 M $\Omega$
Resistance (4.5)	-	$\pm 1 \%$	$\pm 2 \%$ ; $\pm 5 \%$
Temperature coefficient (4.8.4.2)	20/- 55/20 °C and 20/125/20 °C	$\pm 100$ ppm/K	$\pm 200$ 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) <sup>(2)</sup>	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

<b>APPLICABLE SPECIFICATIONS</b>	
• 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



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**