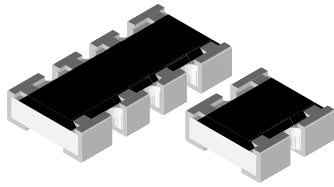


Thick Film Chip Resistor Array



The CRA04S thick film resistor array is 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 with square corners
- Wide ohmic range: 10R to 1M0
- 4 or 8 terminal package with isolated resistors
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS							
MODEL	CIRCUIT	POWER RATING $P_{70^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V_{\equiv}	TEMPERATURE COEFFICIENT \pm ppm/K	TOLERANCE \pm %	RESISTANCE RANGE Ω	E-SERIES
CRA04S	03	0.063	50	100	1	10 to 1M	24 + 96
				200	2; 5		24
Zero-Ohm-Resistor: $R_{\text{max.}} \leq 50 \text{ m}\Omega$, $I_{\text{max.}} = 1 \text{ A}$							

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	CRA04S
Rated dissipation at 70 °C ⁽²⁾	W per element	0.063
Limiting element voltage ⁽¹⁾	V_{\equiv}	50
Insulation voltage (1 min)	$V_{\text{DC/AC peak}}$	100
Category temperature range	°C	-55 to +155
Insulation resistance	Ω	$> 10^9$

Notes

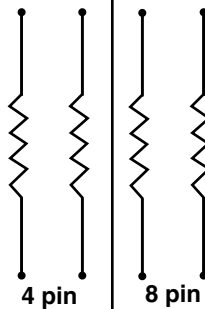
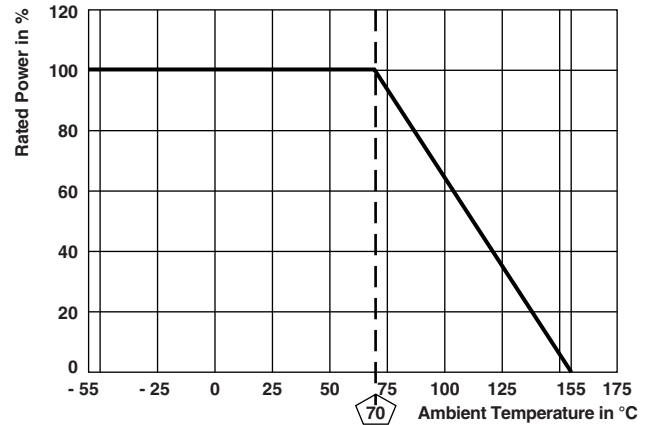
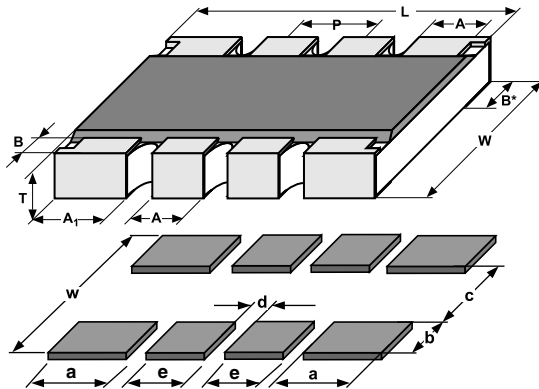
- (1) Rated voltage: $\sqrt{P \times R}$
- (2) The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rate dissipation applies only if the permitted film temperature of 155 °C is not exceeded

PART NUMBER AND PRODUCT DESCRIPTION																	
Part Number: CRA04S08347K0JTD ⁽¹⁾																	
C	R	A	0	4	S	0	8	3	4	7	K	0	J	T	D		
MODEL	TERMINAL STYLE	PIN	CIRCUIT	VALUE		TOLERANCE		PACKAGING ⁽²⁾		SPECIAL							
CRA04	S	04 08	3 = 03	R = decimal K = thousand M = million 0000 = 0 Ω jumper		F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ Z = 0 Ω jumper		TD TC PZ		Up to 2 digits							
Product Description: CRA04S 08 03 473 J RT7 e3																	
CRA04S	08	03	473		J	RT7	e3										
MODEL	TERMINAL COUNT	CIRCUIT TYPE	RESISTANCE VALUE		TOLERANCE	PACKAGING ⁽⁴⁾	LEAD (Pb)-FREE										
CRA04S	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	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
CRA04S	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	A ₁	B	B*	P _{NOM.}	T	W
4	1.0 ± 0.1	-	0.33	0.15	0.25	0.65	0.35	1.0
8	2.0 ± 0.2	0.30	0.4	0.15	0.25	0.50	0.45	1.0
TOL.	-	± 0.15	± 0.15	± 0.10	± 0.1	-	± 0.1	± 0.15

SOLDER PAD DIMENSIONS in millimeters						
	c	w	d	a	b	e
WAVE	0.45	1.45	0.2	0.4	0.5	0.3

The dimensions shown are for a 8 pin part. For parts with different pin numbers use the same pitch and add or subtract pads as required.



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:		
	CRA04S	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, dry heat 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



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.