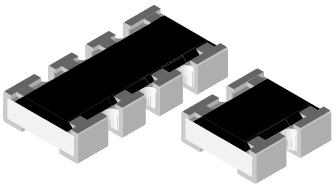
Thick Film Chip Resistor Array



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
- Lead (Pb)-free solder contacts on Ni barrier layer
- Pure tin plating 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

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
CRA04S	03	0.063	50	100	1	10 to 1M	24 + 96
				200	2; 5		24
		Zero-Ohm-Resistor: $R_{max.} \leq 50$ mΩ, $I_{max.} = 1$ A					

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRA04S
Rated dissipation at 70 °C (2)	W per element	0.063
Limiting element voltage (1)	V≅	50
Insulation voltage (1 min)	$V_{DC/AC\ peak}$	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 (3)

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

MODEL	TERMINAL STYLE	PIN	CIRCUIT	VALUE	TOLERANCE	PACKAGING (4)	SPECIAL
CRA04	**S**	**04** **08**	**3** = 03	**R** = Decimal **K** = Thousand **M** = Million **0000** = 0 Ω Jumper	**F** = ± 1 % **G** = ± 2 % **J** = ± 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 kΩ **4702** = 47 kΩ **10R0** = 10 Ω **100** = 10 Ω **000** = 0 Ω Jumper First two digits (3 for 1 %) are significant. Last digit is the multiplier.	**F** = ± 1 % **G** = ± 2 % **J** = ± 5 % **Z** = 0 Ω Jumper	**RT7** **RT6** **PZ**	**e3** = Pure tin termination finish

Notes

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

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

For technical questions, contact: thickfilmchip@vishay.com
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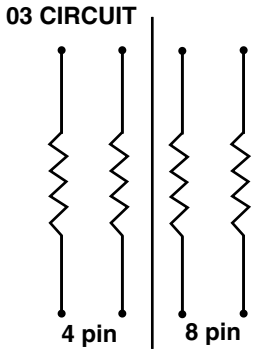
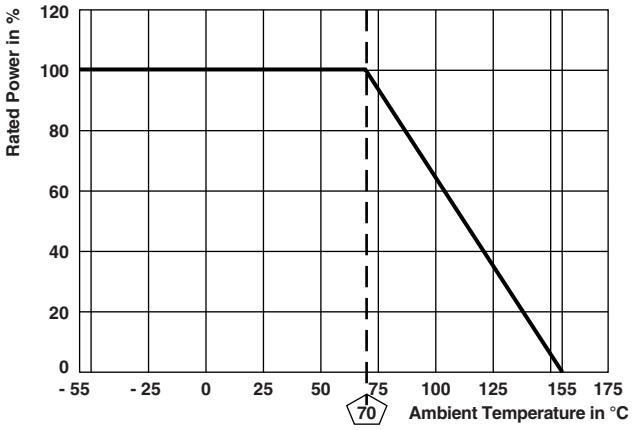
PACKAGING

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

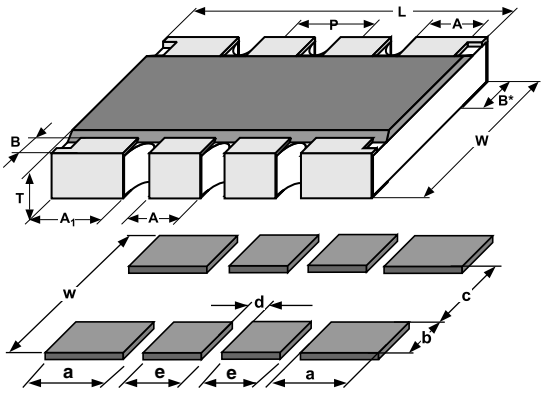
CIRCUIT



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 substract pads as required.

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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 MΩ	10 Ω to 1 MΩ
Resistance (4.5)	-	± 1 %	± 2 %; ± 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)	$U = 2.5 \times (P_{70} \times R)^{1/2}$ ≤ 2 x $U_{max.}$; 0.5 s	± (0.25 % R + 0.05 Ω)	± (0.5 % R + 0.05 Ω)
Solderability (4.17.5) [2]	Aging 4 h at 155 °C, dryheat solder bath method; 235 °C; 2 s visual examination	Good tinning (≥ 95 % covered) no visible damage	
Resistance to soldering heat (4.18.2)	Solder bath method; (260 ± 5) °C; (10 ± 1) s	± (0.25 % R + 0.05 Ω)	± (0.5 % R + 0.05 Ω)
Rapid change of temperature (4.19)	30 min at LCT = - 55 °C; 30 min at UCT = 125 °C; 5 cycles	± (0.25 % R + 0.05 Ω)	± (0.5 % R + 0.05 Ω)
Damp heat, steady state (4.24)	(40 ± 2) °C; 56 days; (93 ± 3) % RH	± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)
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	± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)
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	± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)
Extended endurance (4.25.1.8)	Duration extended to 8000 h	± (2 % R + 0.1 Ω)	± (4 % R + 0.1 Ω)
Endurance at upper category temperature (4.25.3)	UCT = 125 °C; 1000 h	± (1 % R + 0.05 Ω)	± (2 % R + 0.1 Ω)

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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