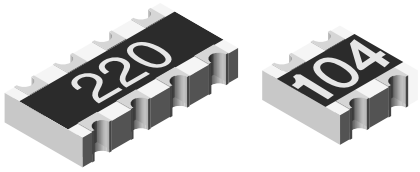
# Thick Film Chip Resistor Array




CRA06P thick film resistor array is constructed on a high grade ceramic body with concave terminations. A small package enables the design of high density circuits. The single component reduces board space, component counts and assembly costs.

## FEATURES

- Concave terminal array with square corners
- 4 and 8 terminal package with isolated resistors
- Wide ohmic range: 10R to 1M0
- 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 |
|---|---|---|---|---|---|---|---|
| CRA06P | 03 | 0.063 | 50 | 100 | 1 | 10 to 1M | 24 + 96 |
| | | | | 200 | 2; 5 | | 24 |
| | | Zero-Ohm-Resistor: $R_{max.}$ = 50 mΩ, $I_{max.}$ = 1 A | | | | | |

## TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | CRA06P 03 CIRCUIT |
|---|---|---|
| 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 rated dissipation applies only if the permitted film temperature of 155 °C is not exceeded.

## PART NUMBER AND PRODUCT DESCRIPTION

**Part Number: CRA06P08347K0JTA (3)**

| C | R | A | 0 | 6 | P | 0 | 8 | 3 | 4 | 7 | K | 0 | J | T | A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MODEL | TERMINAL STYLE | PIN | CIRCUIT | VALUE | TOLERANCE | PACKAGING (4) | SPECIAL |
|---|---|---|---|---|---|---|---|
| **CRA06** | **P** | **04**<br>**08** | **3** = 03 | **R** = Decimal<br>**K** = Thousand<br>**M** = Million<br>**0000** = 0 Ω Jumper | **F** = ± 1 %<br>**G** = ± 2 %<br>**J** = ± 5 %<br>**Z** = 0 Ω Jumper | **TA**<br>**TC** | Up to 2 digits |

**Product Description: CRA06P 08 03 473 J RT1 e3**

| CRA06P | 08 | 03 | 473 | J | RT1 | e3 |
|---|---|---|---|---|---|---|
| MODEL | TERMINAL COUNT | CIRCUIT TYPE | RESISTANCE VALUE | TOLERANCE | PACKAGING (4) | LEAD (Pb)-FREE |
| **CRA06P** | **04**<br>**08** | **03** | **473** = 47 kΩ<br>**4702** = 47 kΩ<br>**10R0** = 10 Ω<br>**100** = 10 Ω<br>**000** = 0 Ω Jumper<br>First two digits (3 for 1 %) are significant. Last digit is the multiplier. | **F** = ± 1 %<br>**G** = ± 2 %<br>**J** = ± 5 %<br>**Z** = 0 Ω Jumper | **RT1**<br>**RT6** | **e3** = Pure tin termination finish |

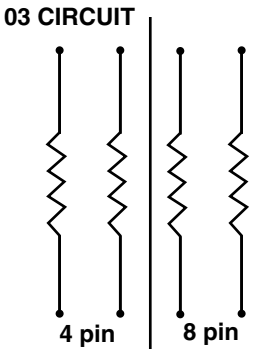
**Notes**

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

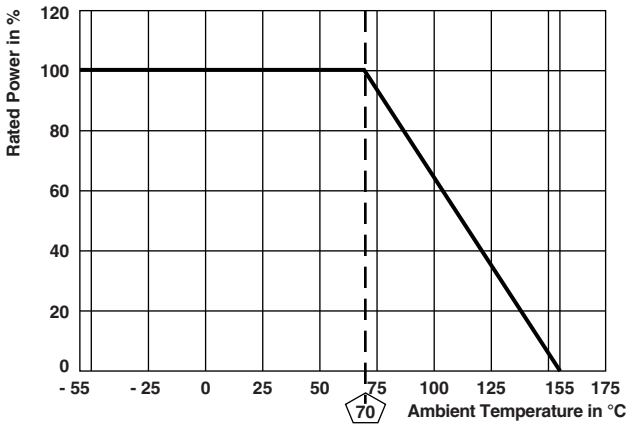
(4) Please refer to the table PACKAGING, see next page.

| PACKAGING | | | | | | |
|---|---|---|---|---|---|---|
| MODEL | TAPE WIDTH | DIAMETER | PITCH | PIECES/REEL | PACKAGING CODE | |
| | | | | | PAPER TAPE | |
| | | | | | PART NUMBER | PRODUCT DESCRIPTION |
| CRA06P | 8 mm | 180 mm/7" | 4 mm | 5000 | TA | RT1 |
| | | 330 mm/13" | 4 mm | 20 000 | TC | RT6 |

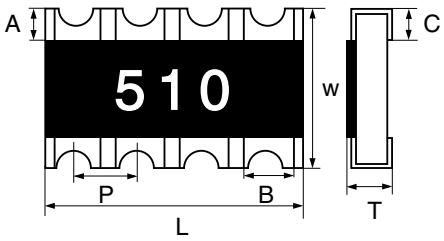
## CIRCUIT



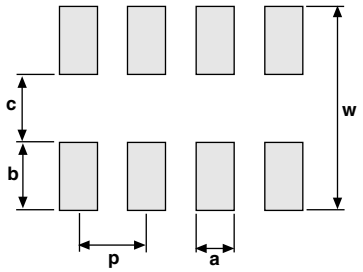

## DERATING




## DIMENSIONS




| PIN NO# | DIMENSIONS in millimeters | | | | | | |
|---|---|---|---|---|---|---|---|
| | L | A | B | C | P | T | W |
| 4 | 1.60 | 0.30 | 0.40 | 0.40 | 0.80 | 0.60 | 1.60 |
| 8 | 3.20 | 0.30 | 0.40 | 0.40 | 0.80 | 0.60 | 1.60 |
| Tol. | ± 0.20 | ± 0.20 | ± 0.15 | ± 0.20 | - | ± 0.10 | ± 0.15 |




| SOLDER PAD DIMENSIONS in millimeters | | | | | |
|---|---|---|---|---|---|
| | c | w | p | a | b |
| WAVE | 0.8 | 2.6 | 0.8 | 0.4 | 0.9 |

## 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: **CRA06P** | 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<br>Solder bath method; 235 °C; 2 s<br>Visual examination | Good tinning (≥ 95 % covered)<br>no visible damage | |
| Resistance to soldering heat (4.18.2) | Solder bath method;<br>(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;<br>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;<br>(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;<br>2 h at LCT = - 55 °C;<br>1 h/1 kPa at 15 °C to 35 °C;<br>5 cycles at 55 °C<br>$U = (P_{70} \times R)^{1/2}$<br>$U = U_{max.}$; whichever is less severe | ± (1 % $R$ + 0.05 Ω) | ± (2 % $R$ + 0.1 Ω) |
| Endurance at 70 °C (4.25.1) | $U = (P_{70} \times R)^{1/2}$<br>$U = U_{max.}$; whichever is less severe<br>1.5 h “ON”; 0.5 h “OFF”;<br>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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