



# THICK FILM CHIP RESISTORS

RCA Series



## Automotive Grade, Sulfur Resistant, Thick Film, Rectangular Chip Resistors

### KEY BENEFITS

- Superior resistance against  $H_2S$  atmosphere
- AEC-Q200 rev. C qualified
- Compliant to RoHS directive 2002/95/EC
- Lead (Pb)-bearing versions available too
- Halogen-free according to IEC 61249-2-21 definition

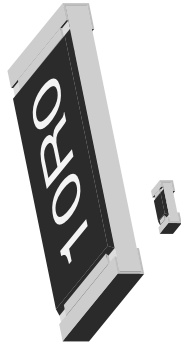
### APPLICATIONS

- Automotive
- Industrial equipment
- General purpose in sulfur environment

# Automotive Grade, Sulfur Resistant, Thick Film, Rectangular Chip Resistors

## FEATURES

- Superior resistance against H<sub>2</sub>S-atmosphere
- Stability  $\Delta R/R = 1\%$  for 1000 h at 70 °C
- Metal glaze on high quality ceramic
- Pure tin solder contacts on Ni barrier layer, provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition AEC-Q200 qualified, rev. C compliant



| STANDARD ELECTRICAL SPECIFICATIONS |      |        |                                               |                                     |                                     |                             |                                 |           |
|------------------------------------|------|--------|-----------------------------------------------|-------------------------------------|-------------------------------------|-----------------------------|---------------------------------|-----------|
| MODEL                              | SIZE |        | POWER RATING<br>$P_{70^{\circ}\text{C}}$<br>W | LIMITING ELEMENT<br>VOLTAGE<br>MAX. | TEMPERATURE<br>COEFFICIENT<br>ppm/K | TOLERANCE<br>%              | RESISTANCE<br>RANGE<br>$\Omega$ | E-SERIES  |
|                                    | INCH | METRIC |                                               |                                     |                                     |                             |                                 |           |
| RCA0402                            | 0402 | RR1005 | 0.063                                         | 50                                  | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 1M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 1M $\Omega$              | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 1$                     | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 1$                     | 1R $\Omega$ to 9R76             | E24 + E96 |
|                                    |      |        |                                               | $\pm 200$                           | $\pm 5$                             | 1R $\Omega$ to 10M $\Omega$ | E24                             |           |
| RCA0603                            | 0603 | RR1608 | 0.10                                          | 75                                  | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 10M $\Omega$            | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |
| RCA0805                            | 0805 | RR2012 | 0.125                                         | 150                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 10M $\Omega$            | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |
| RCA1206                            | 1206 | RR3216 | 0.25                                          | 200                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 1M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |
| RCA1210                            | 1210 | RR3225 | 0.5                                           | 200                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 1M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 1M $\Omega$              | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |
| RCA1218                            | 1218 | RR3246 | 1.0                                           | 200                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 1M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 2M $\Omega$              | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 1$                     | 1R $\Omega$ to 2M $\Omega$      | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 2M $\Omega$      | E24       |
| RCA2010                            | 2010 | RR5025 | 0.75                                          | 400                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 10M $\Omega$            | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |
| RCA2512                            | 2512 | RR6332 | 1.0                                           | 500                                 | $\pm 50$                            | $\pm 0.5, \pm 1$            | 100R to 10M $\Omega$            | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 0.5$                   | 10R to 10M $\Omega$             | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 100$                           | $\pm 1$                     | 1R $\Omega$ to 10M $\Omega$     | E24 + E96 |
|                                    |      |        |                                               |                                     | $\pm 200$                           | $\pm 5$                     | 1R $\Omega$ to 10M $\Omega$     | E24       |

- Notes**
- These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional time. Marking: See document "Surface Mount Resistor Marking" (document number 20020).

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

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Revision 08-Jul-10

| TECHNICAL SPECIFICATIONS                    |                    |         |         |         |                        |         |         |         |         |  |
|---------------------------------------------|--------------------|---------|---------|---------|------------------------|---------|---------|---------|---------|--|
| PARAMETER                                   | UNIT               | RCA0402 | RCA0603 | RCA0805 | RCA1206                | RCA1210 | RCA1218 | RCA2010 | RCA2512 |  |
| Rated dissipation $P_{70}^{(1)}$            | W                  | 0.063   | 0.10    | 0.125   | 0.25                   | 0.5     | 1.0     | 0.75    | 1.0     |  |
| Limiting element voltage $U_{max}$<br>AC/DC | V                  | 50      | 75      | 150     | 200                    | 200     | 200     | 400     | 500     |  |
| Insulation voltage $U_{ins}$ (1 min)        | V                  | > 75    | > 100   | > 200   | > 300                  | > 300   | > 300   | > 300   | > 300   |  |
| Insulation resistance                       | $\Omega$           |         |         |         | > $10^9$               |         |         |         |         |  |
| Category / temperature range                | $^{\circ}\text{C}$ |         |         |         | - 55 to + 155          |         |         |         |         |  |
| Failure rate                                | $\text{h}^{-1}$    |         |         |         | < $0.1 \times 10^{-9}$ |         |         |         |         |  |
| Mass                                        | mg                 | 0.65    | 2       | 5.5     | 10                     | 16      | 29.5    | 25.5    | 40.5    |  |

**Note**  
(1) 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: RCA080510K0FKEA (2)

|         |   |                    |             |           |   |                 |   |               |   |                |   |   |   |   |   |  |  |  |  |  |
|---------|---|--------------------|-------------|-----------|---|-----------------|---|---------------|---|----------------|---|---|---|---|---|--|--|--|--|--|
| R       | R | C                  | A           | 0         | 8 | 0               | 5 | 1             | 0 | K              | 0 | F | K | E | A |  |  |  |  |  |
| MODEL   |   | VALUE              |             | TOLERANCE |   | TCR             |   | PACKAGING (3) |   | SPECIAL        |   |   |   |   |   |  |  |  |  |  |
| RCA0402 |   | R = Decimal        | D = ± 0.5 % |           |   | H = ± 50 ppm/K  |   | EA            |   | Up to 2 digits |   |   |   |   |   |  |  |  |  |  |
| RCA0603 |   | K = Thousand       | F = ± 1 %   |           |   | N = ± 100 ppm/K |   | EC            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA0805 |   | M = Million        | J = ± 5 %   |           |   | K = ± 200 ppm/K |   | EB            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA1206 |   | 0000 = 0.1 Juniper | Z = Juniper |           |   | S = Juniper     |   | ED            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA1210 |   |                    |             |           |   |                 |   | EF            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA1218 |   |                    |             |           |   |                 |   | EG            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA2010 |   |                    |             |           |   |                 |   | EH            |   |                |   |   |   |   |   |  |  |  |  |  |
| RCA2512 |   |                    |             |           |   |                 |   |               |   |                |   |   |   |   |   |  |  |  |  |  |

Product Description: RCA0805 10K 1 % 100 ET1 e3

| MODEL   | 10K                                                     | 1 %                       | TOLERANCE                                | TCR                                                 | PACKAGING (3)                       | LEAD (Pb)-FREE |
|---------|---------------------------------------------------------|---------------------------|------------------------------------------|-----------------------------------------------------|-------------------------------------|----------------|
| RCA0805 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA0402 | 10R = 10 Ω<br>10K = 10 kΩ<br>1M = 1 MΩ<br>0R0 = Juniper | ± 0.5 %<br>± 1 %<br>± 5 % | ± 50 ppm/K<br>± 100 ppm/K<br>± 200 ppm/K | ET1, ET5<br>ET6, ET7<br>ET4, E02<br>E01, E02<br>ET9 | e3 = Pure tin<br>termination finish |                |
| RCA0603 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA0805 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA1210 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA1218 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA2010 |                                                         |                           |                                          |                                                     |                                     |                |
| RCA2512 |                                                         |                           |                                          |                                                     |                                     |                |

## Notes

- (2) Preferred way for ordering products is by use of the PART NUMBER.  
(3) Please refer to table PACKAGING, see next page.

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