



# 5% Thick Film Chip Resistors (RoHS Compliant)

# CR5-RC Series

## FEATURES

- Temperature Range: -55°C ~ +125°C
- High purity alumina substrate
- Wave or flow solderable
- Excellent high frequency characteristics
- Wrap around termination
- Inner electrode protection
- Value range 0Ω ~ 10MΩ



RoHS Compliant



## DERATING CURVE



## REEL DIMENSIONS (mm)



## PART NUMBERING SYSTEM

|        |   |   |   |       |   |   |   |                         |   |
|--------|---|---|---|-------|---|---|---|-------------------------|---|
| 2      | 6 | 0 | - | 1     | 0 | K | - | R                       | C |
| Series |   |   |   | Value |   |   |   | Suffix (RoHS Compliant) |   |

## SERIES, SIZE, WATTAGE, VOLTAGE, AND DIMENSIONS

| Series | Case Size | Watts | Voltage (V) (max.) |      | Dimensions (mm) |            |            |            |           |
|--------|-----------|-------|--------------------|------|-----------------|------------|------------|------------|-----------|
|        |           |       | W.V.               | O.V. | L               | W          | C          | D          | t         |
| 260    | 0805      | 1/10  | 150                | 300  | 2.0 ± 0.15      | 1.25 ± .15 | 0.4 ± 0.2  | 0.4 ± 0.2  | .55 ± .10 |
| 263    | 1206      | 1/8   | 200                | 400  | 3.1 ± 0.15      | 1.55 ± .15 | 0.45 ± 0.2 | 0.45 ± 0.2 | .55 ± .10 |
| 301    | 0603      | 1/16  | 50                 | 100  | 1.60 ± .10      | 0.8 ± .15  | 0.3 ± .20  | 0.30 ± .20 | .45 ± .10 |



## STANDARD STOCKED VALUES (Ω)

|     |     |     |     |    |    |     |     |     |      |      |      |      |     |     |      |      |      |      |      |      |      |
|-----|-----|-----|-----|----|----|-----|-----|-----|------|------|------|------|-----|-----|------|------|------|------|------|------|------|
| 0   | 2.0 | 4.3 | 9.1 | 20 | 43 | 91  | 200 | 430 | 910  | 2K   | 4.3K | 9.1K | 20K | 43K | 91K  | 200K | 430K | 820K | 1.8M | 3.9M | 8.2M |
| 1.0 | 2.2 | 4.7 | 10  | 22 | 47 | 100 | 220 | 470 | 1K   | 2.2K | 4.7K | 10K  | 22K | 47K | 100K | 220K | 470K | 910K | 2M   | 4.3M | 9.1M |
| 1.1 | 2.4 | 5.1 | 11  | 24 | 51 | 110 | 240 | 510 | 1.1K | 2.4K | 5.1K | 11K  | 24K | 51K | 110K | 240K | 510K | 1M   | 2.2M | 4.7M | 10M  |
| 1.2 | 2.7 | 5.6 | 12  | 27 | 56 | 120 | 270 | 560 | 1.2K | 2.7K | 5.6K | 12K  | 27K | 56K | 120K | 270K | 560K | 1.1M | 2.4M | 5.1M |      |
| 1.3 | 3.0 | 6.2 | 13  | 30 | 62 | 130 | 300 | 620 | 1.3K | 3K   | 6.2K | 13K  | 30K | 62K | 130K | 300K | 620K | 1.2M | 2.7M | 5.6M |      |
| 1.5 | 3.3 | 6.8 | 15  | 33 | 68 | 150 | 330 | 680 | 1.5K | 3.3K | 6.8K | 15K  | 33K | 68K | 150K | 330K | 660K | 1.3M | 3M   | 6.2M |      |
| 1.6 | 3.6 | 7.5 | 16  | 36 | 75 | 160 | 360 | 750 | 1.6K | 3.6K | 7.5K | 16K  | 36K | 75K | 160K | 360K | 680K | 1.5M | 3.3M | 6.8M |      |
| 1.8 | 3.9 | 8.2 | 18  | 39 | 82 | 180 | 390 | 820 | 1.8K | 3.9K | 8.2K | 18K  | 39K | 82K | 180K | 390K | 750K | 1.6M | 3.6M | 7.5M |      |

## NOTE: RoHS Compliant by Exemption

## CONSTRUCTION

| No. | Part Name                                                             |
|-----|-----------------------------------------------------------------------|
| 1   | Protective coating: Epoxy                                             |
| 2   | Al <sub>2</sub> O <sub>3</sub> high purity alumina substrate: Al 96fi |
| 3   | Resistive element: metal film                                         |
| 4   | Termination (Inner): Ag/Pd                                            |
| 5   | Termination (Between): Ni plating film                                |
| 6   | Termination (Outer): Sn plating film                                  |





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# CR5-RC Series

## ■ CHARACTERISTICS

| Characteristics                 | Limits                                                                                     | Test Methods ( JIS C 5201-1 )                                                                                                                                                                                                                                                                                           |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
|---------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------|---|------------|---------|---|------------|------------|---|-------------|---------|---|------------|------------|
| Temperature coefficient         | 1Ω ~ 10Ω ≤ ±400 PPM / °C<br>11Ω ~ 10MΩ ≤ ±200 PPM / °C                                     | 5.2 Natural resistance change per temp. degree centigrade.<br>R2-R1<br>————— x10 <sup>6</sup> (PPM/°C)<br>R1(t2-t1)<br>R1: Resistance value at room temperature (t1)<br>R2: Resistance value at room temp.plus 100°C (t2)                                                                                               |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Short time overload             | Resistance change rate is ± (2.0 % + 0.1Ω) Max.                                            | 5.5 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.                                                                                                                                                                                                                   |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Insulation resistance           | 1,000M Ω or more                                                                           | 5.6 Apply 500V DC between protective coating and termination for 1 minute                                                                                                                                                                                                                                               |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Dielectric withstanding voltage | No evidence of flashover mechanical damage,arcing or insulation break down.                | 5.7 Apply 500V AC between protective coating and termination for 1 minute                                                                                                                                                                                                                                               |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Terminal bending                | ±(1.0% +0.05Ω) Max.                                                                        | 6.1.4 Twist of Test Board:<br>Y/X=5/90mm for 10 seconds                                                                                                                                                                                                                                                                 |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Temperature cycling             | ± (1.0% + 0.05Ω) Max.                                                                      | 7.4 Resistance change after continuous 5 cycles for duty shown below:                                                                                                                                                                                                                                                   |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            | <table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>-55°C ±3°C</td><td>30 mins</td></tr><tr><td>2</td><td>Room temp.</td><td>10~15 mins</td></tr><tr><td>3</td><td>+155°C ±2°C</td><td>30 mins</td></tr><tr><td>4</td><td>Room temp.</td><td>10~15 mins</td></tr></table>                   | Step        | Temperature | Time | 1 | -55°C ±3°C | 30 mins | 2 | Room temp. | 10~15 mins | 3 | +155°C ±2°C | 30 mins | 4 | Room temp. | 10~15 mins |
|                                 |                                                                                            | Step                                                                                                                                                                                                                                                                                                                    | Temperature | Time        |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            | 1                                                                                                                                                                                                                                                                                                                       | -55°C ±3°C  | 30 mins     |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            | 2                                                                                                                                                                                                                                                                                                                       | Room temp.  | 10~15 mins  |      |   |            |         |   |            |            |   |             |         |   |            |            |
| 3                               | +155°C ±2°C                                                                                | 30 mins                                                                                                                                                                                                                                                                                                                 |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| 4                               | Room temp.                                                                                 | 10~15 mins                                                                                                                                                                                                                                                                                                              |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            |                                                                                                                                                                                                                                                                                                                         |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            |                                                                                                                                                                                                                                                                                                                         |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
|                                 |                                                                                            |                                                                                                                                                                                                                                                                                                                         |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Load life in humidity           | Resistance change rate is ± (3.0% + 0.1Ω) Max.                                             | 7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40°C ± 2°C and 90 to 95 % relative humidity                                                                                                                                                        |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Load life                       | Resistance change rate is ± (3.0% + 0.1Ω) Max.                                             | 7.10 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of ( 1.5 hours "on", 0.5 hour "off" ) at 70°C ± 2°C ambient                                                                                                                                                                       |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Soldering Heat                  | Electrical characteristics shall be satisfied. Without distinct deformation in appearance. | <u>Solder bath method</u><br>Pre-Heat: 100 to 105°C, 30 ±5 sec.<br>Temperature: 265 ± 3°C, 5 +1/-0 sec<br><br><u>Reflow soldering method</u><br>Peak: 250 +5/-0°C<br>230°C or higher, 30 ±10Sec.<br><br><u>Solder iron method</u><br>Bit temperature: 350° ±10°C<br>Application time of soldering iron: 3 +1/-0 seconds |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |
| Solderability                   | 95% Coverage min.                                                                          | 6.5 Test temperature of solder: 245° ±3°C<br>Dipping them solder: 2~3 seconds                                                                                                                                                                                                                                           |             |             |      |   |            |         |   |            |            |   |             |         |   |            |            |

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

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<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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