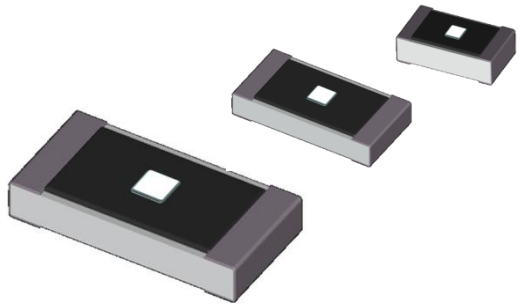
# Anti-Sulfur Thick Film Chip Resistors

- 0603(0201), 1005(0402), 1608(0603), 2012(0805), 3216(1206), 3225(1210), 5025(2010), 6432(2512)

## ■ Features

- Small, thin and lightweight
- High reliability
- Stable in Sulfur Atmosphere (Anti-sulfur)
- Suitable size and package for surface mount assembly
- RoHS Compliant.



## ■ Part Number System

| RCS |
|---|
| Type |

| | |
|---|---|
| RCS | Anti-Sulfur chip resistor |

| 1005 | |
|---|---|
| Size : mm (inch) | |
| 0603 | 0.6×0.3mm (0201) |
| 1005 | 1.0×0.5mm (0402) |
| 1608 | 1.6×0.8mm (0603) |
| 2012 | 2.0×1.2mm (0805) |
| 3216 | 3.2×1.6mm (1206) |
| 3225 | 3.2×2.5mm (1210) |
| 5025 | 5.0×2.5mm (2010) |
| 6432 | 6.4×3.2mm (2512) |

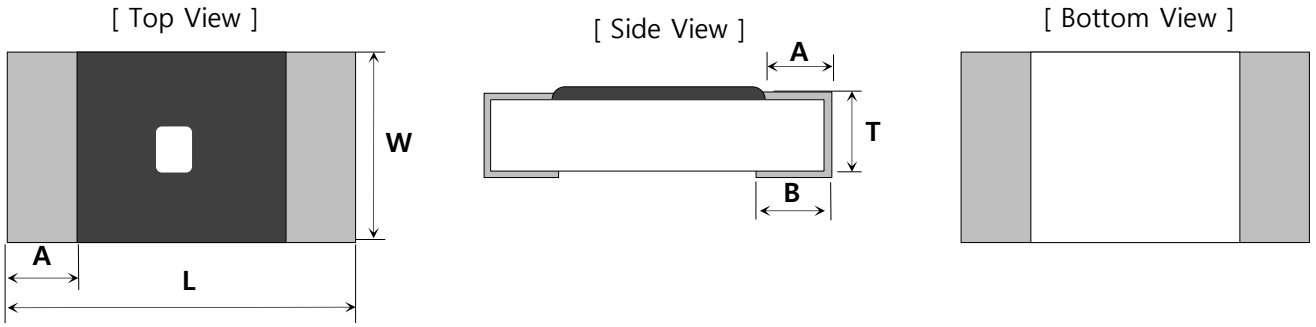
| J | |
|---|---|
| Tolerance | |
| D | ±0.5% |
| F | ±1% |
| G | ±2% |
| J | ±5% |

* Jumper : 'J'

| 150 |
|---|
| Resistance Value |
| - 3-digit coding System (E-24 series)<br>- 4-digit coding System (E-96 series)<br>- Jumper : '000' |

| CS | |
|---|---|
| Packing Type | |
| CS | 7" reel |
| ES | 10" reel |
| AS | 13" reel |

## ■ Structure and Dimensions




[ Unit : mm ]

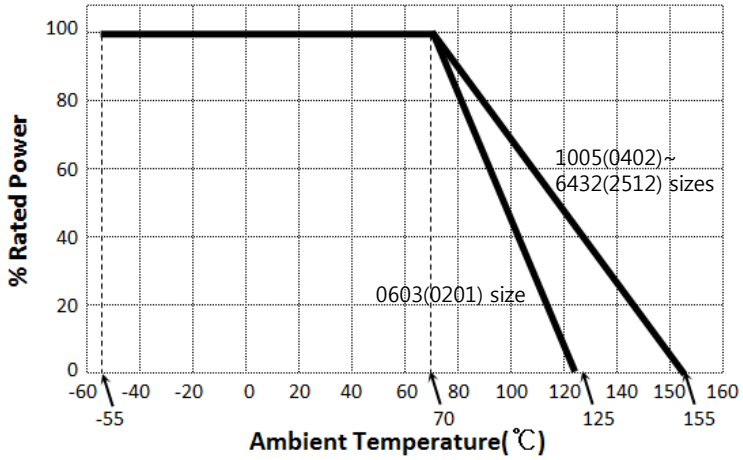
| Size(mil) | L | W | T | A | B | Unit Weight |
|---|---|---|---|---|---|---|
| **RCS0603(0201)** | 0.60±0.03 | 0.30±0.03 | 0.23±0.03 | 0.10±0.05 | 0.15±0.05 | 0.15mg |
| **RCS1005(0402)** | 1.00±0.05 | 0.50±0.05 | 0.35±0.05 | 0.20±0.10 | 0.25±0.10 | 0.6mg |
| **RCS1608(0603)** | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.35±0.10 | 2.1mg |
| **RCS2012(0805)** | 2.00±0.20 | 1.25±0.15 | 0.55±0.10 | 0.40±0.20 | 0.35±0.20 | 4.9mg |
| **RCS3216(1206)** | 3.20±0.20 | 1.60±0.15 | 0.55±0.10 | 0.45±0.20 | 0.40±0.20 | 9.5mg |
| **RCS3225(1210)** | 3.20±0.20 | 2.55±0.20 | 0.55±0.10 | 0.45±0.20 | 0.40±0.20 | 16mg |
| **RCS5025(2010)** | 5.00±0.20 | 2.50±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 | 26mg |
| **RCS6432(2512)** | 6.30±0.20 | 3.20±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 | 41mg |

## ■ Applications and Ratings

| Type | Size (mil) | Rated Power [W] | Rated Voltage [V] | Max Working Voltage [V] | Tolerance [%] | Resistance Range [Ω] | T.C.R [ppm/℃] | Working Temp. [℃] | Moisture Level |
|---|---|---|---|---|---|---|---|---|---|
| **RCS0603** | 0201 | 1/20 | $\sqrt{P \times R}$<br>P:Rated Power(W)<br>R:Resistance(Ω) | 25 | ±0.5(D)<br>±1(F)<br>±5(J) | 1 ~ 10M | 1~9.9Ω : ±300<br>10~10MΩ : ±250 | -55~125 | Level 1 |
| **RCS1005** | 0402 | 1/16 | | 50 | ±0.5(D)<br>±1(F)<br>±5(J) | 1 ~ 10M | 1~9.9Ω : ±300<br>10~10MΩ : ±100 | -55 ~ 155 | |
| **RCS1608** | 0603 | 1/10 | | 50 | | | | | |
| **RCS2012** | 0805 | 1/8 | | 150 | | | | | |
| **RCS3216** | 1206 | 1/4 | | 200 | | | | | |
| **RCS3225** | 1210 | 1/3 | | 200 | | | | | |
| **RCS5025** | 2010 | 2/3 | | 200 | | | | | |
| **RCS6432** | 2512 | 1 | | 200 | | | | | |

• Please contact our sales representatives or engineers for other specifications

## ■ Power Derating Curve




## ■ Jumper Ratings

| Type | Rated Current (A) | Max Overload Current (A) |
|---|---|---|
| **0603** | 0.5 | 1 |
| **1005, 1608** | 1 | 2 |
| **2012, 3216, 3225, 5025, 6432** | 2 | 4 |

## ■ Rated Voltage

$$V = \sqrt{P \times R}$$

E : Rated Voltage (V)
P : Rated Power (W)
R : Resistance Value (Ω)

## ■ Rated Voltage

1. The rated voltage for resistor can be a DC continuous working voltage or AC(rms) voltage in commercial line frequency wave form at rated power. It can be expressed as below.

$E = \sqrt{P \times R}$ E : Rated Voltage(V) P : Rated Power(W) R : Nominal Resistance(Ω)

If the value calculated by the equation exceeds Max working Voltage, the rated voltage is limited to max working voltage. In other words, the lower value is the rated voltage.

ex) For RC1608 Series [ P=0.1(W), Max working voltage = 50(V) ]

1) The rated voltage, when R=1KΩ

$E = \sqrt{0.1 \times 1000} = 10(V)$

Value is lower than Max working voltage, therefore $E = 10(V)$

2) The rated voltage, when R=100KΩ

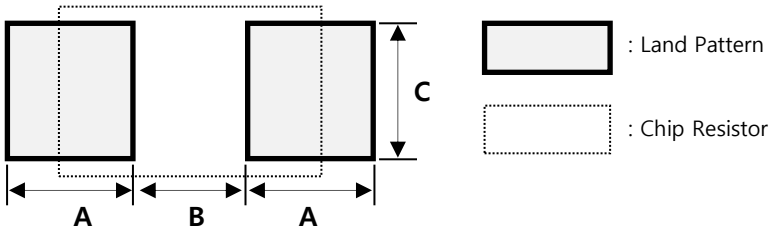
$E = \sqrt{0.1 \times 100000} = 100(V)$

Value is higher than Max working voltage, therefore $E = 50(V)$

2. When the rated voltage is applied to the resistor, check the ambient temperature and decrease the lower according to the power derating curve.
3. If higher voltage than rated voltage, the reliability condition and performance cannot be guaranteed.

* If pulse wave is applied, the maximum pulse power should be below the rated voltage.

## ■ Standard Soldering Pad Dimensions




[ Unit : mm ]

| Size(mil) | Reflow Soldering | | | |
|---|---|---|---|---|
| | A | B | 2A + B | C |
| RCS0603(0201) | 0.37 | 0.28 | 1.02 | 0.29 |
| RCS1005(0402) | 0.60 | 0.50 | 1.70 | 0.50 |
| RCS1608(0603) | 0.80 | 0.80 | 2.40 | 0.80 |
| RCS2012(0805) | 0.90 | 1.40 | 3.20 | 1.20 |
| RCS3216(1206) | 1.30 | 1.80 | 4.40 | 1.50 |
| RCS3225(1210) | 1.30 | 1.80 | 4.40 | 2.40 |
| RCS5025(2010) | 1.40 | 3.30 | 6.10 | 2.40 |
| RCS6432(2512) | 1.40 | 4.60 | 7.40 | 3.00 |

## ■ Performance Characteristics

| ITEM | Requirements Specification | Test Conditions (JIS C 5201-1) |
|---|---|---|
| **Resistance** | Within the specified tolerance | JIS C 5201-1 4.5 |
| **Temp. Characteristic** | Within the specified T.C.R | JIS C 5201-1 4.8<br>+20℃ → -55℃ / +20℃ → +125℃ |
| **Short time Overload** | ΔR < ±1%+0.1Ω | JIS C 5201-1 4.13<br>Rated Voltage×2.5, 5sec |
| **Solderability** | Immersed over 95% | JIS C 5201-1 4.17<br>Rosin Ethanol (25%WT)<br>245+5/-0℃, 2±0.5 sec |
| **Resistance to Solder Heat** | ΔR < ±1%+0.1Ω | JIS C 5201-1 4.18<br>260±5℃, 10±1 sec |
| **Temp. Cycle** | ΔR < ±1%+0.1Ω | JIS C 5201-1 4.19<br>-55℃ ↔ +125℃, 100 cycle |
| **Moisture Resistance** | ΔR < ±3%+0.1Ω | JIS C 5201-1 4.24<br>40±2℃, 90~95%RH, 1,000$^{+48}$hours |
| **Load Life** | ΔR < ±3%+0.1Ω | JIS C 5201-1 4.25<br>Rated Voltage, 70±2℃, 1,000$^{+48}$hours<br>90mins ON, 30mins OFF |
| **High Temp. Exposure** | ΔR < ±3%+0.1Ω | JIS C 5201-1 4.23<br>155±2℃, 1,000$^{+48}$hours |
| **Flower of Sulfur (FOS)** | ΔR < ±1%+0.1Ω | 105℃, FoS, 720$^{+2}$hours |

※ The reliability test condition can be replaced by the corresponding accelerated test condition.

Product specifications included in the specifications are effective as of January 04, 2019.

Please be advised that they are standard product specifications for reference only.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,

please contact our sales personnel or application engineers.