

# Thick Film General Chip Resistors

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

## ■ Features

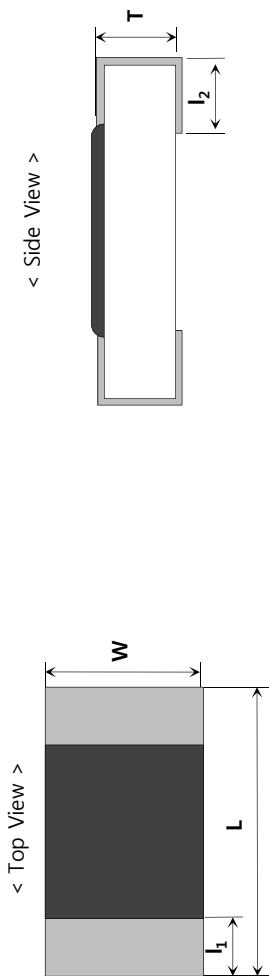
- Small, thin and lightweight
- High reliability
- Applicable Both flow and reflow soldering.
- Suitable size and package for surface mount assembly
- RoHS Compliant.



## ■ Part Number System

| RC   |                               | 1005             |                  | F              |     | 245                                                                                             |                              | CS           |          |
|------|-------------------------------|------------------|------------------|----------------|-----|-------------------------------------------------------------------------------------------------|------------------------------|--------------|----------|
| Type |                               | Size : mm (inch) |                  | Tolerance      |     | Resistance Value                                                                                |                              | Packing Type |          |
| RC   | General purpose chip resistor | 1005             | 1.0×0.5mm (0402) | F              | ±1% | -3-digit coding System (E-24 series)<br>-4-digit coding System (E-96 series)<br>-Jumper : '000' | ex)245: 2,400,000Ω<br>=2.4MΩ | CS           | 7" reel  |
|      |                               | 1608             | 1.6×0.8mm (0603) | G              | ±2% |                                                                                                 |                              | ES           | 10" reel |
|      |                               | 2012             | 2.0×1.2mm (0805) | J              | ±5% |                                                                                                 |                              | AS           | 13" reel |
|      |                               | 3216             | 3.2×1.6mm (1206) | * Jumper : 'J' |     |                                                                                                 |                              |              |          |
|      |                               | 3225             | 3.2×2.5mm (1210) |                |     |                                                                                                 |                              |              |          |
|      |                               | 5025             | 5.0×2.5mm (2010) |                |     |                                                                                                 |                              |              |          |
|      |                               | 6432             | 6.4×3.2mm (2512) |                |     |                                                                                                 |                              |              |          |

## ■ Structure and Dimensions



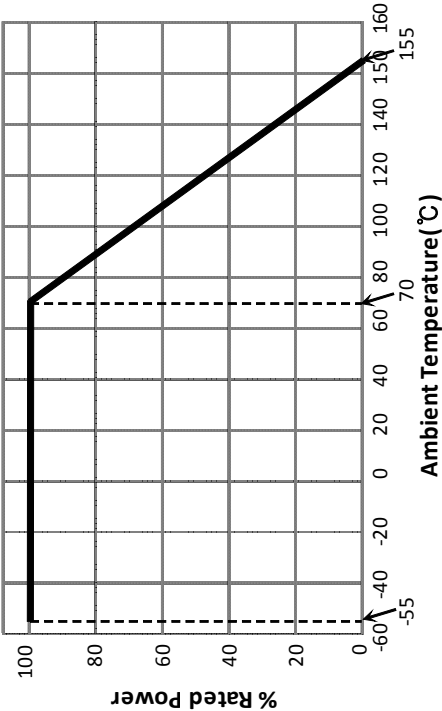
( Unit : mm )

| TYPE (Inch) | L         | W         | T         | I <sub>1</sub> | I <sub>2</sub> | Unit Weight |
|-------------|-----------|-----------|-----------|----------------|----------------|-------------|
| 1005 (0402) | 1.00±0.05 | 0.50±0.05 | 0.35±0.05 | 0.20±0.10      | 0.25±0.10      | 0.6mg       |
| 1608 (0603) | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20      | 0.35±0.10      | 2.1mg       |
| 2012 (0805) | 2.00±0.15 | 1.25±0.15 | 0.50±0.10 | 0.40±0.20      | 0.35±0.20      | 4.9mg       |
| 3216 (1206) | 3.20±0.15 | 1.60±0.15 | 0.55±0.10 | 0.45±0.20      | 0.40±0.20      | 9.5mg       |
| 3225 (1210) | 3.20±0.20 | 2.55±0.20 | 0.55±0.10 | 0.45±0.20      | 0.40±0.20      | 16mg        |
| 5025 (2010) | 5.00±0.20 | 2.50±0.20 | 0.55±0.10 | 0.60±0.20      | 0.60±0.20      | 26mg        |
| 6432 (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        | Power Rating<br>at 70°C<br>(W) | Max Working<br>Voltage<br>(V) | Max Overload<br>Voltage<br>(W) | Resistance<br>Range<br>(Ω) | T.C.R<br>(ppm/°C)                                          | Working<br>Temperature<br>(°C) |
|-------------|--------------------------------|-------------------------------|--------------------------------|----------------------------|------------------------------------------------------------|--------------------------------|
| 1005 (0402) | 1/16                           | 50                            | 100                            | 1 ~ 10M                    | 1~9.9Ω :+300,-200<br>10Ω ~ 1MΩ : ±100<br>1.1MΩ~10MΩ : ±300 | -55 ~ 155                      |
| 1608 (0603) | 1/10                           | 50                            | 100                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |
| 2012 (0805) | 1/8                            | 150                           | 300                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |
| 3216 (1206) | 1/4                            | 200                           | 400                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |
| 3225 (1210) | 1/3                            | 200                           | 400                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |
| 5025 (2010) | 2/3                            | 200                           | 400                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |
| 6432 (2512) | 1                              | 200                           | 400                            | 1 ~ 10M                    |                                                            | -55 ~ 155                      |

■ Power Derating Curve



**Rated Voltage**

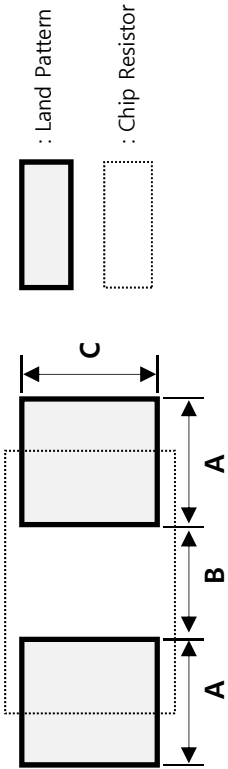
$$E = \sqrt{P \times R}$$

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

■ Jumper Ratings

| Type                            | Rated<br>Current (A) | Max Overload<br>Current (A) |
|---------------------------------|----------------------|-----------------------------|
| 1005, 1608                      | 1                    | 2                           |
| 2012, 3216, 3225,<br>5025, 6432 | 2                    | 4                           |

## ■ Recommended land pattern



[ Unit : mm ]

| TYPE (Inch) | Reflow Soldering |      |        |      | Flow Soldering |      |        |      |
|-------------|------------------|------|--------|------|----------------|------|--------|------|
|             | A                | B    | 2A + B | C    | A              | B    | 2A + B | C    |
| Dimension   |                  |      |        |      |                |      |        |      |
| 1005 (0402) | 0.60             | 0.50 | 1.70   | 0.50 | 0.70           | 0.50 | 1.90   | 0.50 |
| 1608 (0603) | 0.80             | 0.80 | 2.40   | 0.80 | 0.90           | 0.80 | 2.60   | 0.80 |
| 2012 (0805) | 0.90             | 1.40 | 3.20   | 1.20 | 1.00           | 1.40 | 3.40   | 1.30 |
| 3216 (1206) | 1.30             | 1.80 | 4.40   | 1.50 | 1.40           | 1.80 | 4.60   | 1.60 |
| 3225 (1210) | 1.30             | 1.80 | 4.40   | 2.40 | 1.40           | 1.80 | 4.60   | 2.60 |
| 5025 (2010) | 1.40             | 3.30 | 6.10   | 2.40 | 1.50           | 3.30 | 6.30   | 2.50 |
| 6432 (2512) | 1.40             | 4.60 | 7.40   | 3.00 | 1.50           | 4.60 | 7.60   | 3.20 |

## ■ Performance Characteristics

| ITEM                       | Requirements Specification        | Test Conditions (JIS C 5201-1)                                                                  |
|----------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------|
| Resistance                 | Within the specified tolerance    | JIS C 5201-1 4.5                                                                                |
| Temperature Characteristic | Within the specified T.C.R        | JIS C 5201-1 4.8<br>+20°C → -55°C / +20°C → +125°C                                              |
| Short time Overload        | $\Delta R < \pm 1\% + 0.1\Omega$  | JIS C 5201-1 4.13<br>Rated Voltage $\times 2.5$ , 5sec                                          |
| Solderability              | Immersed over 95%                 | JIS C 5201-1 4.17<br>Rosin Ethanol (25%WT)<br>245 $\pm$ 5/-0°C, 2 $\pm$ 0.5 sec                 |
| Resistance to Solder Heat  | $\Delta R < \pm 1\% + 0.05\Omega$ | JIS C 5201-1 4.18<br>260 $\pm$ 5°C, 10 $\pm$ 1 sec                                              |
| Temperature Cycle          | $\Delta R < \pm 1\% + 0.1\Omega$  | JIS C 5201-1 4.19<br>-55°C ↔ +155°C, 100 cycle                                                  |
| Moisture Resistance        | $\Delta R < \pm 3\% + 0.1\Omega$  | JIS C 5201-1 4.24<br>40 $\pm$ 2°C, 90~95%RH, 1,000 $^{+48}$ hours                               |
| Load Life                  | $\Delta R < \pm 3\% + 0.1\Omega$  | JIS C 5201-1 4.25<br>Rated Voltage, 70 $\pm$ 2°C, 1,000 $^{+48}$ hours<br>90mins ON, 30mins OFF |
| High Temp. Exposure        | $\Delta R < \pm 3\% + 0.1\Omega$  | JIS C 5201-1 4.25.3<br>155 $\pm$ 2°C, 1,000 $^{+48}$ hours                                      |

※ NOTICE :All specifications are subject to change without previous notice. Please contact with product representatives or engineers to check specifications.