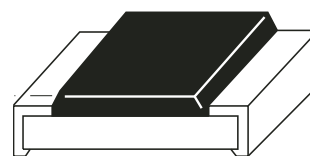


THICK FILM CHIP RESISTOR - GENERAL

Features

- Miniature, Light-weight
- Ideal for reflow and wave flow solder
- Low assembly cost, suit for automatic SMT equipment
- Stable properties, high reliability
- Superior mechanical and frequency characteristics
- RoHS Compliant



How to Order

| | | | | | | |
|---|---|----|---|-----|---|---|
| R | S | 05 | K | 103 | J | T |
| | | | | | | |
| A | B | C | D | E | F | G |

| A | | B | | C | | D | | | E | |
|--------------------------------|--|--------------------------|---------------------|-----------|------|------------------------------------|------|------------|---|--|
| Product Code | | Power Rating Series Code | | Size Code | | Resistance Temperature Coefficient | | | Resistance Value | |
| Thick Film Chip Fixed Resistor | | | | Code | Size | Code | Type | T.C.R. | E24 Series - expressed in 3 digits | |
| | | Code | Power Rating Series | 02 | 0402 | 0201 | W | ±200ppm/°C | First two digits are significant figures, the third digit denotes the number of zeros | |
| | | C | Normal Series | 03 | 0603 | 0402 | U | ±400ppm/°C | | |
| | | S | Upgrade Series | 05 | 0805 | 0603 | K | ±100ppm/°C | E96 Series - expressed in 4 digits | |
| | | | | 06 | 1206 | 0805 | | | First 3 digit are significant figures, the fourth digit denotes the number of zeros | |
| | | | | 1210 | 1210 | 1206 | | | | |
| | | | | 1812 | 1812 | 1210 | | | | |
| | | | | 10 | 2010 | 1812 | L | ±250ppm/°C | | |
| | | | | 12 | 2512 | 2010 | | | | |
| | | | | | | 2512 | | | | |

Decimal place is expressed by "R". In this scenario all digits are significant figures

Jumper is expressed by 000

Example:

103=10KΩ (E-24)
1243=124KΩ(E-96)
1R0=1RΩ

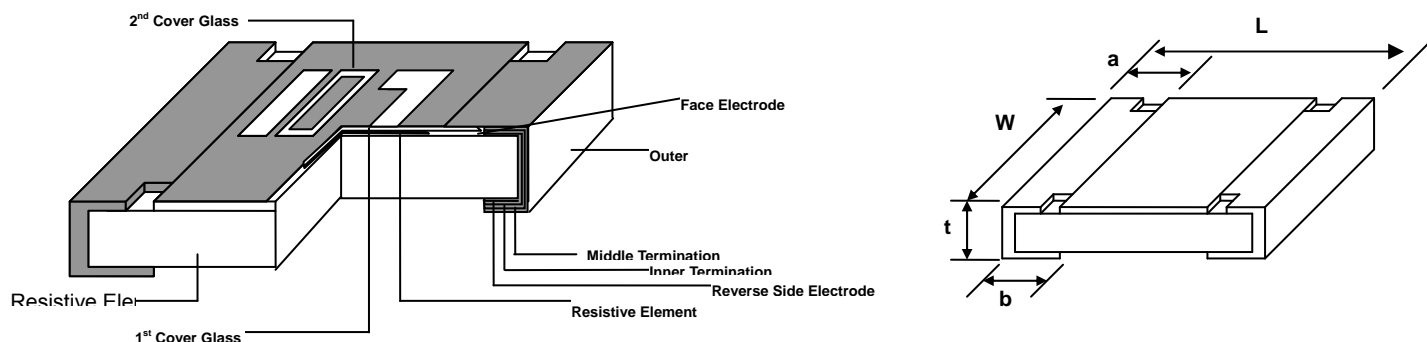
Standard Resistance Series

| E-24 Series | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.0 | 1.1 | 1.2 | 1.3 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.7 | 3.0 |
| 3.3 | 3.6 | 3.9 | 4.3 | 5.1 | 5.6 | 6.2 | 6.8 | 7.5 | 8.2 | 9.1 |

| E-96 Series | | | | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|------|------|------|
| 1.00 | 1.02 | 1.05 | 1.07 | 1.10 | 1.13 | 1.15 | 1.18 | 1.21 | 1.24 | 1.27 | 1.30 |
| 1.33 | 1.37 | 1.40 | 1.43 | 1.47 | 1.51 | 1.54 | 1.58 | 1.62 | 1.65 | 1.69 | 1.74 |
| 1.78 | 1.82 | 1.87 | 1.91 | 1.96 | 2.00 | 2.05 | 2.10 | 2.15 | 2.21 | 2.26 | 2.32 |
| 2.37 | 2.43 | 2.49 | 2.55 | 2.61 | 2.67 | 2.74 | 2.80 | 2.87 | 2.94 | 3.01 | 3.09 |
| 3.16 | 3.24 | 3.32 | 3.40 | 3.48 | 3.57 | 3.65 | 3.74 | 3.83 | 3.92 | 4.02 | 4.12 |
| 4.22 | 4.32 | 4.42 | 4.53 | 4.64 | 4.75 | 4.87 | 4.99 | 5.11 | 5.23 | 5.36 | 5.49 |
| 5.62 | 5.76 | 5.90 | 6.04 | 6.19 | 6.34 | 6.49 | 6.65 | 6.81 | 6.98 | 7.15 | 7.32 |
| 7.50 | 7.68 | 7.87 | 8.06 | 8.25 | 8.45 | 8.66 | 8.87 | 9.09 | 9.31 | 9.53 | 9.76 |

THICK FILM CHIP RESISTOR - GENERAL

Construction and Dimensions



| Type | Dimensions(mm) | | | | |
|------|----------------|-----------|----------|-----------|-----------|
| | L | W | a | b | f |
| 0402 | 1.0±0.10 | 0.5±0.10 | 0.2±0.1 | 0.25±0.1 | 0.30±0.10 |
| 0603 | 1.6±0.15 | 0.8±0.15 | 0.3±0.15 | 0.30±0.20 | 0.40±0.1 |
| 0805 | 2.0±0.15 | 1.25±0.15 | 0.4±0.20 | 0.4±0.20 | 0.5±0.1 |
| 1206 | 3.1±0.15 | 1.6±0.15 | 0.5±0.20 | 0.50±0.20 | 0.60±0.1 |

Rated Power

| Item | | 0402 | 0603 | 0805 | 1206 |
|-----------------------------|----------------|------------------------|-------|-------|------|
| Rated power | Normal Series | 1/16W | 1/16W | 1/10W | 1/8W |
| | Upgrade Series | N/A | 1/10W | 1/8W | 1/4W |
| Max. Operating Voltage | | 50V | 50V | 150V | 200V |
| Max. Over Load Voltage | | 100V | 100V | 300V | 400V |
| Resistance Tolerance | | ±1%(F) ±2%(G) ±5%(J) | | | |
| Resistance Range | | E-24,E-96 Series | | | |
| Jumper Rated Current | | 1A | 1A | 2A | 2A |
| Jumper Resistance Value | | 50mΩ Max | | | |
| Operating Temperature Range | | -55°C ~+125°C | | | |
| Temperature Coefficient | | ±250ppm/°C/±100ppm/°C/ | | | |
| Rated temperature | | +70°C | | | |

Characteristics

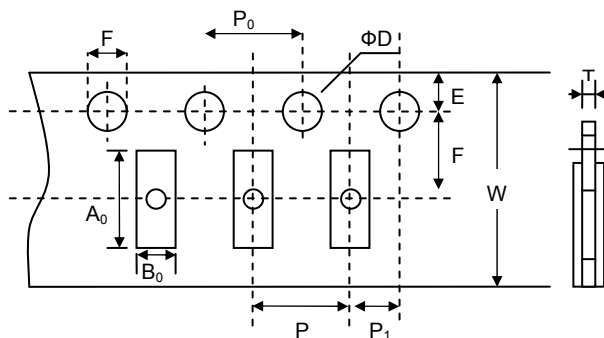
| Item | Specifications | Test Methods (JIs c 5202) |
|------------------------------|--|--|
| Temperature Cycling | $\Delta R \leq \pm(1.0\%R+0.05\Omega)$ | -55°C ~ +125°C for 5 cycles |
| Short Time Over Load | $\Delta R \leq \pm(2\%R+0.1\Omega)$ | Rated Voltage x2.5 for 5 seconds |
| Resistance To Soldering Heat | $\Delta R \leq \pm(1.0\%R+0.05\Omega)$ | 260°C ±5°C for 10 seconds |
| Load Life | $\Delta R \leq \pm(3\%R+0.1\Omega)$ | 70°C±2°C,1000h at RcvW 1.5Hrs ON,0.5Hrs OFF |
| Solderability | ≥ 95% Coverage | 235°C ±5°C 3 seconds |
| Bending Strength | $\Delta R \leq \pm(1.0\%R+0.05\Omega)$ | 3mm Bending Distance: 3mm (10 seconds) |
| T.C.R. | Within specified T.C.R. | Measure between -55°C ~ + 125°C |
| Steady State Humidity | $\Delta R \leq \pm(3.0\%R+0.1\Omega)$ | 40°C±2°C 90%~95%RH at 1000h |
| Upper Temperature Endurance | $\Delta R \leq \pm(3.0\%R+0.1\Omega)$ | 125°C±2°C at 1000h |
| Resistance to Solvent | $\Delta R \leq \pm(1.0\%R+0.05\Omega)$ | Submerge in chloroethylene(氯乙烯)for 10h±1h |
| Adhesion | No visible damage on surface | Apply 5N force for 10s±1s |
| Insulation Resistance | 1000MΩ Min | Check insulation resistance, after applying DC 100V between substrate and termination for 1 minute |

THICK FILM CHIP RESISTOR - GENERAL

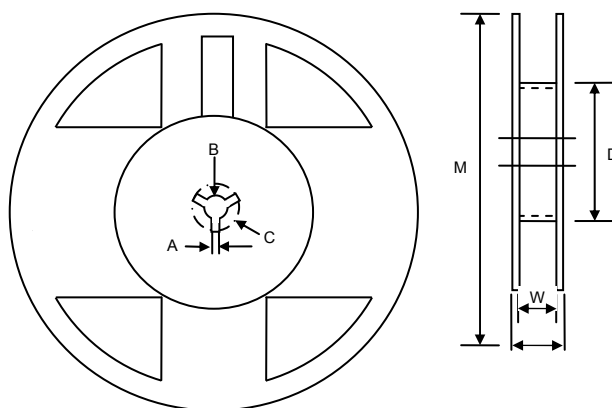
Packaging

Tape and Reel

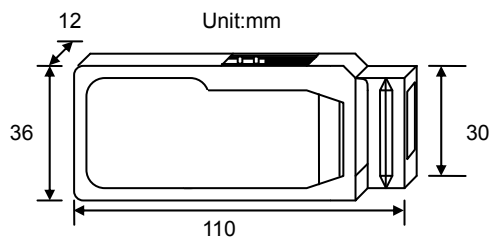
| Type | A | B | W | F | E | P | P1 | P0 | D0 | T |
|------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0402 | 1.2±0.1 | 0.7±0.1 | 0.8±0.20 | 3.5±0.05 | 1.75±0.1 | 2.0±0.01 | 2.0±0.05 | 4.0±0.05 | 1.5±0.10 | 0.6max |
| 0603 | 1.85±0.10 | 1.10±0.10 | 0.8±0.20 | 3.5±0.05 | 1.75±0.1 | 4.0±0.10 | 2.0±0.05 | 4.0±0.05 | 1.5±0.10 | 0.6±0.1 |
| 0805 | 2.35±0.15 | 1.65±0.20 | 0.8±0.20 | 3.5±0.05 | 1.75±0.1 | 4.0±0.10 | 2.0±0.05 | 4.0±0.05 | 1.5±0.10 | 0.75±0.1 |
| 1206 | 3.50±0.15 | 1.90±0.20 | 0.8±0.20 | 3.5±0.05 | 1.75±0.1 | 4.0±0.10 | 2.0±0.05 | 4.0±0.05 | 1.5±0.10 | 0.75±0.1 |



| Type | W | M | A | B | C | D |
|------|----------|---------|---------|----------|----------|----------|
| 0402 | | | | | | |
| 0603 | | | | | | |
| 0805 | 12.5±0.5 | 178±2.0 | 2.0±0.5 | 13.5±0.5 | 21.0±0.5 | 80.0±2.0 |
| 1206 | | | | | | |



Bulk Case



Packaging Quantity

| (Pcs/Reel)Tape & Reel | | (Pcs/case) | | | |
|-----------------------|------------------|------------|-------|-------|------|
| 0402 | 0603, 0805, 1206 | 0402 | 0603 | 0805 | 1206 |
| 10000 | 5000 | 50000 | 25000 | 10000 | 5000 |