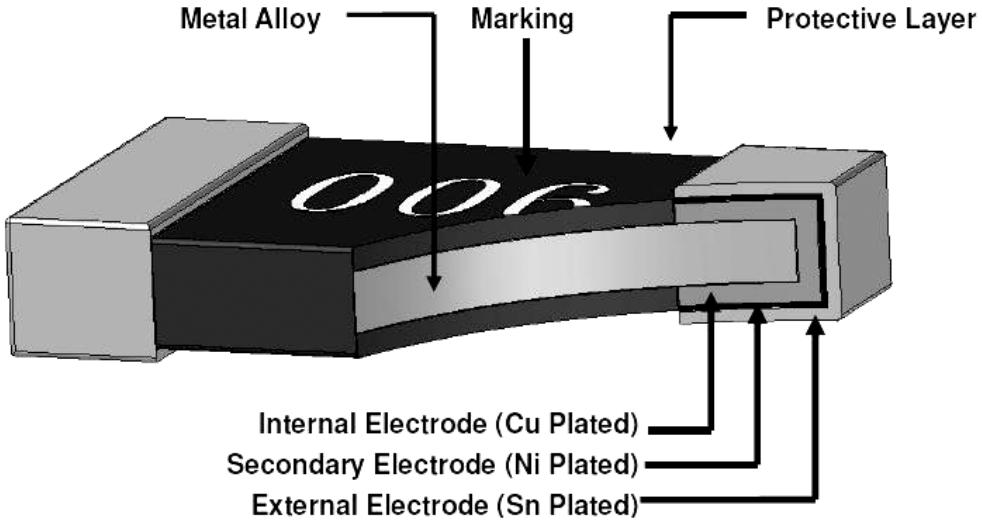

## Applications

Ⅰ Power supply
Ⅱ Battery pack
Ⅲ DIY tools
Ⅳ Inverter / Converter (AC/DC, DC/DC, DC/AC)
Ⅴ Measurable instrument
Ⅵ Consumer electronics
Ⅶ Note book
Ⅷ PC power pack
Ⅸ LED driver
Ⅹ Others (Auto tronics ⋯ etc.)

## Features

Ⅰ Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifiers.
Ⅱ High-temperature performance (up to +275℃).
Ⅲ Very low inductance 0.5nH to 5nH.
Ⅳ Excellent frequency response.
Ⅴ Stable high frequency characteristic with reduced lead inductance and excellent frequency response.
Ⅵ Low thermal EMF (<1μV/℃).
Ⅶ Pure tin plating provides compatibility with lead (Pb) free and lead containing soldering processes.
Ⅷ Excellent stability (|ΔR/R| ≤ ± 0.5% for 1000h at 100℃) different environmental conditions.

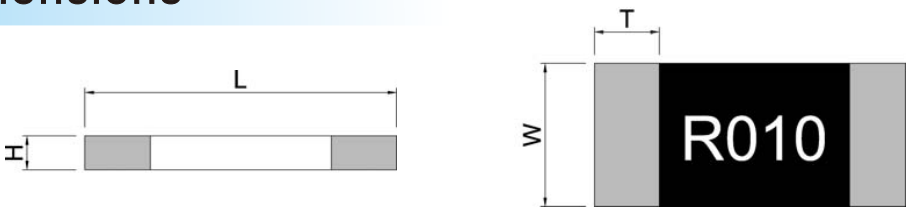
## Construction




## Reference Standards

JISC 5201-1

## Dimensions



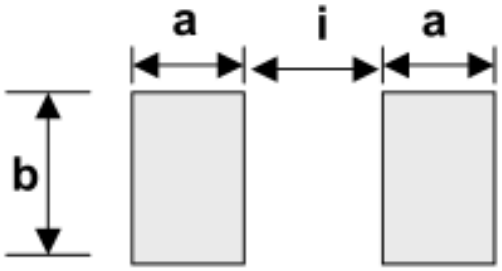

Uint: mm

| Type | Power | Resistance(mΩ) | L | W | H | T |
|---|---|---|---|---|---|---|
| LR1206 | 1W | 1～50 | 3.15±0.254 | 1.60±0.254 | 0.75±0.254 | 0.50±0.254 |
| LR2010 | 1W | 0.5～3 | 5.10±0.254 | 2.54±0.254 | 0.8±0.254 | 1.295±0.254 |
| | | 4～100 | | | | 0.8±0.254 |
| LR2512 | 1W,1.5W 2W | 0.5～4 | 6.25±0.254 | 3.30±0.254 | 0.8±0.254 | 1.88±0.254 |
| | | 4.1～100 | | | | 1.13±0.254 |
| | 2W | 4.1～100 | | | | 1.13±0.254 |
| | 3W | 0.5 | | | | 1.88±0.254 |
| | | 0.6～2.9 & 4.1～100 | | | | 1.13±0.254 |
| | | 3～4 | | | | 1.68±0.254 |
| LR2725 | 4W | 0.25,0.5 | 6.8±0.254 | 6.007±0.254 | 1.0±0.254 | 2.15±0.254 |
| | | 1 | | | 1.1±0.254 | 2.15±0.254 |
| | | 1.5 | | | 1.0±0.254 | 2.15±0.254 |
| | | 2 | | | 0.9±0.254 | 1.8±0.254 |
| | | 2.5 | | | | 1.65±0.254 |
| | | 3 | | | | 1.3±0.254 |
| LR2728 | 3W,3.5W,4W | 4～100 | 6.7±0.254 | 7.2±0.254 | 1.0±0.254 | 1.15±0.254 |
| LR4527 | 5W | 0.5～100 | 11.6±0.254 | 6.75±0.254 | 1.5±0.254 | 3.3±0.254 |
| | | | | | | 1.9±0.254 |

## Power 、Tolerance And Resistance

| Model | Power rating at 100℃ | Resistance (mΩ) | TCR (PPM/℃) | Operating temperature range(℃) | Max. rating current | Max. overload current | Resistance range(mΩ) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.5%(D) | 1.0%(F | 5.0%(J) |
| LR1206 | 1W | 1～4 | +50 | -65～275 | 31.62A | 63.25A | 7～50 | 1～50 | 1～50 |
| | | 4.1～15 | -25 | | | | | | |
| | | 15.1～50 | -15 | | | | | | |
| LR2010 | 1W | 0.5～3 | +50 | | 44.72A | 89.44A | 3～100 | 0.5～100 | 0.5～100 |
| | | 3.1～6.9 | -25 | | | | | | |
| | | 7～100 | -15 | | | | | | |
| LR2512 | 1W | 0.5～3 | +50 | | 44.72A | 100.00A | 7～100 | 0.5～100 | 0.5～100 |
| | | 3.1～6.9 | -25 | | | | | | |
| | | 7～100 | -15 | | | | | | |
| | 1.5W | 0.5～3 | +50 | | 54.77A | 122.48A | | | |
| | | 3.1～6.9 | -25 | | | | | | |
| | | 7～100 | -15 | | | | | | |
| | 2W | 0.5～3 | +50 | | 63.25A | 126.49A | 7～75 | 0.5～75 | 0.5～75 |
| | | 3.1～6.9 | -25 | | | | | | |
| | | 7～100 | -15 | | | | | | |
| | 3W | 0.5～2.0 | +50 | | 77.46A | 134.16A | 7～10 | 0.5～10 | 0.5～10 |
| | | 2.1～100 | -25 | | | | | | |
| LR2725 | 4W | 0.25～0.9 | +50 | | 126.49A | 252.95A | / | 0.25～3 | 0.25～3 |
| | | 1～3 | -25 | | | | | | |
| LR2728 | 3W | 4～7 | -25 | | 27.39A | 47.43A | 4～100 | 4～100 | 4～100 |
| | | 7.1～100 | -15 | | | | | | |
| | 3.5W | 4～7 | -25 | | 29.58A | 51.23A | | | |
| | | 7.1～100 | -15 | | | | | | |
| | 4W | 4～7 | -25 | | 31.62A | 63.25A | 4～50 | 4～50 | 4～50 |
| | | 7.1～50 | -15 | | | | | | |
| LR4527 | 5W | ≤±50 | | -55～170 | 100A | 200A | / | 0.5～100 | 0.5～100 |

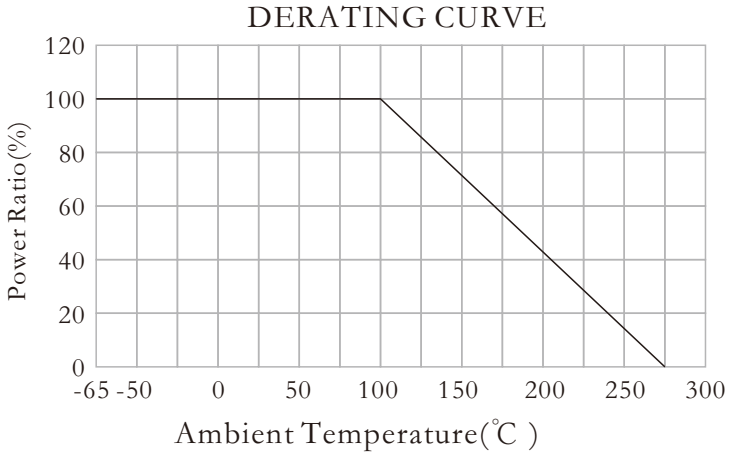
## Recommend Land Pattern Design ( For Reflow Soldering )

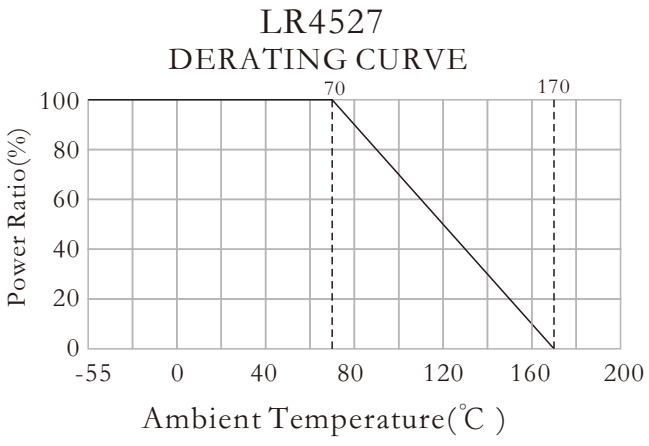



Uint:mm

| Type | Power | Resistance(mΩ) | a | b | c |
|---|---|---|---|---|---|
| LR1206 | 1W | 1～50 | 1.60 | 2.18 | 0.66 |
| LR2010 | 1W | 0.5～3 | 1.80 | 2.92 | 1.22 |
| | | 4～100 | 2.29 | 2.92 | 2.41 |
| LR2512 | 1W,1.5W,2W | 0.5～4 | 3.05 | 3.68 | 1.27 |
| | 1W,1.5W | 4.1～100 | 2.11 | 3.68 | 3.18 |
| | 2W | 4.1～100 | 2.11 | 3.68 | 3.18 |
| | 3W | 0.5 | 3.05 | 3.68 | 1.27 |
| | | 0.6～2.9 & 4.1～100 | 2.11 | 3.68 | 3.18 |
| | | 3～4 | 2.11 | 3.68 | 3.18 |
| LR2725 | 4W | 0.25,0.5 | 3.18 | 6.86 | 1.32 |
| | | 1 | | | |
| | | 1.5 | | | |
| | | 2 | | | |
| | | 2.5 | | | |
| | | 3 | | | |
| LR2728 | 3W,3.5W,4W | 4～100 | 2.75 | 7.82 | 3.51 |
| LR4527 | 5W | 0.5～3.0 | 4.80 | 8.74 | 5.51 |
| | | 3.1～100 | 3.40 | 8.74 | 8.31 |

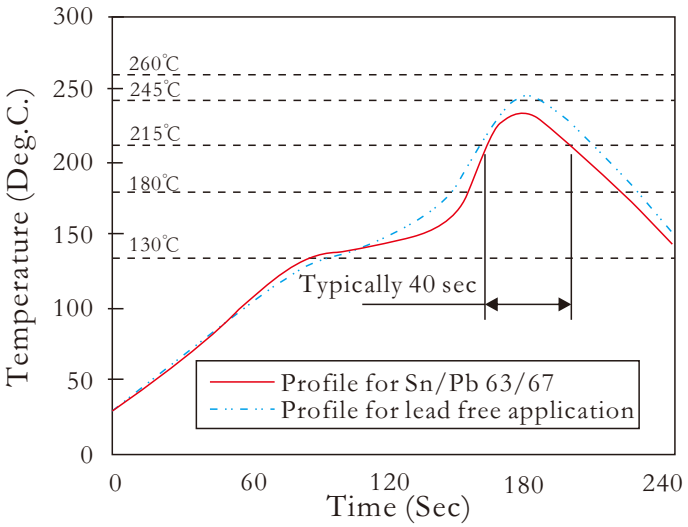
## Derating curvve



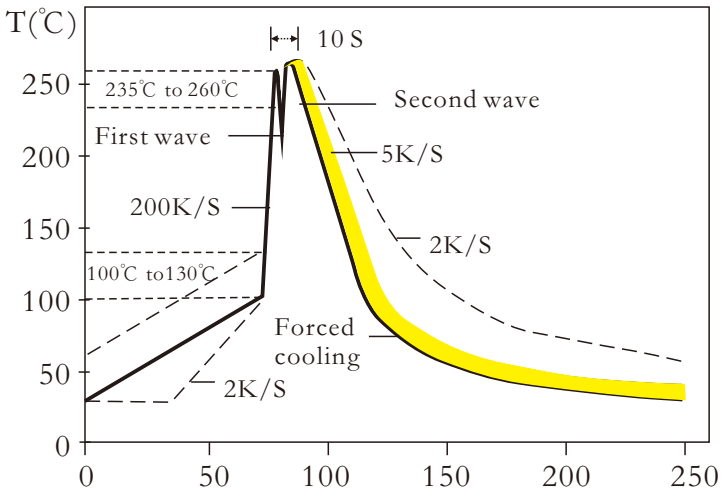



## Recommend Soldering Conditions

Surface-mount components are tested for solderability at a temperature of 245 ° C for 3 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in below:

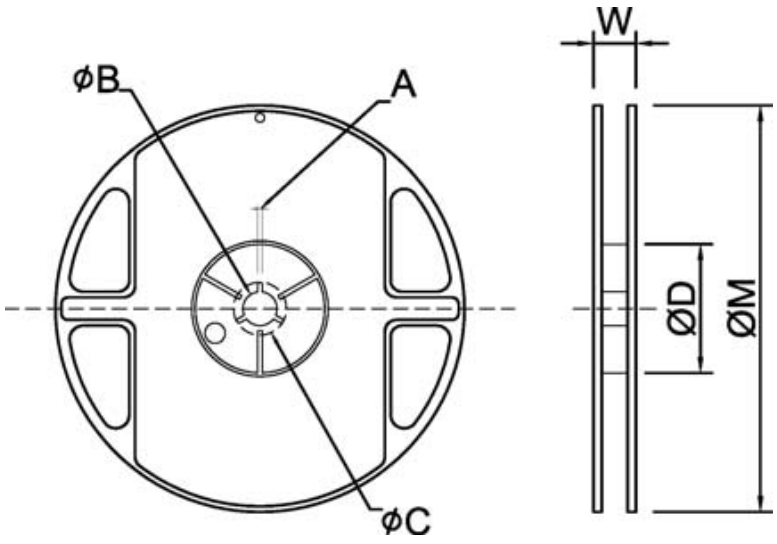



Recommended IR Reflow Soldering Profile




Recommended double-wave Soldering Profile
Typical values (solid line)
Process limits (dotted line)

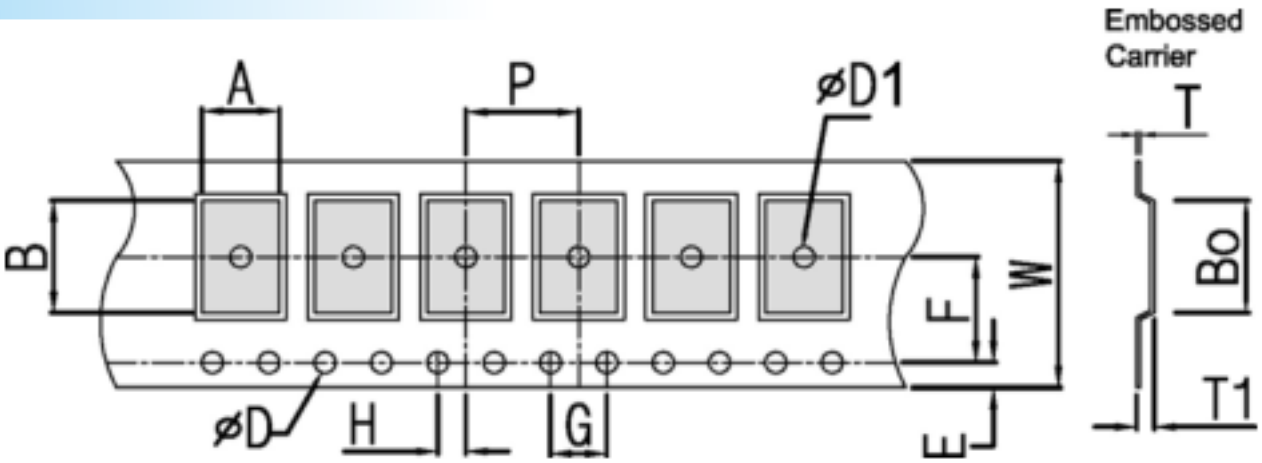
## Packaging




Uint:mm

| Reel Type / Tape | A | ΦB | ΦC | ΦD | W | ΦM |
|---|---|---|---|---|---|---|
| 7” reel for 12 mm embossed | 2.5±0.5 | 13.5±0.5 | 17.7±0.5 | 60.0±0.5 | 16.2±0.5 | 178±1.0 |
| 7” reel for 8 mm embossed (for LR1206 only) | 2.0±0.5 | 13.2±0.5 | 17.7±0.5 | 60.0±0.5 | 12.0±0.5 | 178±1.0 |
| 7” reel for 24 mm embossed | 2.0±0.5 | 13.5±0.5 | 17.7±0.5 | 60.0±0.5 | 24.4±2.0 | 178±1.0 |

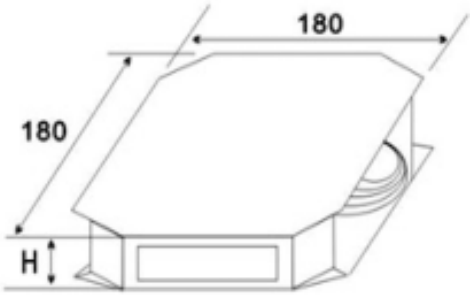
## Embossed Dimension

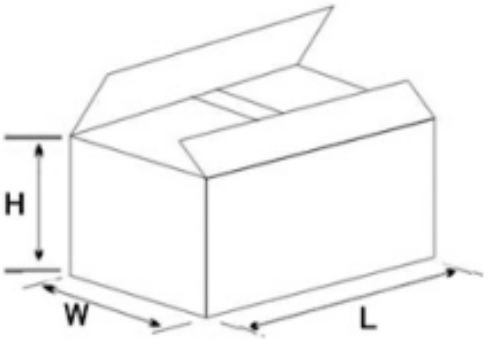



Uint: mm

| Item | W | P | E | F | ΦD | ΦD1 | G | H | A | Bo | T1 | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LR1206 | 8.00 | 4.00 | 1.75 | 3.50 | 1.55 | 1.00 | 4.00 | 2.00 | 1.83 | 3.50 | 0.90 | 0.20 |
| LR2010 | 12.00 | 4.00 | 1.75 | 5.50 | 1.50 | 1.50 | 4.00 | 2.00 | 2.90 | 5.45 | 1.10 | 0.23 |
| LR2512 | 12.00 | 8.00 | 1.75 | 5.50 | 1.55 | 1.50 | 4.00 | 2.00 | 3.90 | 6.74 | 1.08 | 0.24 |
| LR2725 | 12.00 | 8.00 | 1.75 | 5.50 | 1.50 | 1.50 | 4.00 | 2.00 | 6.75 | 7.15 | 1.70 | 0.25 |
| LR2728 | 12.00 | 12.00 | 1.75 | 5.50 | 1.55 | 1.55 | 4.00 | 2.00 | 7.70 | 7.15 | 1.20 | 0.25 |
| Tolerance | ±0.15 | ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.05 |
| LR4527 | 24.00 | 12.00 | 1.75 | 11.50 | 1.50 | 1.50 | 4.00 | 2.00 | 7.12 | 11.70 | 1.55 | 0.30 |
| Tolerance | ±0.30 | ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 |

## Embossed Dimension




| Inner Box Size | | |
|---|---|---|
| Reel | H(mm) | |
| | LR1206 only | Other series |
| 1 | 16 | 24 |
| 2 | 24 | 36 |
| 3 | 36 | 58 |
| 4 | 48 | 72 |
| 5 | 58 | 83 |

| External Box Size | | | |
|---|---|---|---|
| Contain (Kpcs) | Length (mm) | Width (mm) | Height (mm) |
| 5K | 195 | 130 | 200 |
| 10K | 195 | 185 | 200 |
| 20K | 375 | 185 | 200 |
| 30K | 375 | 270 | 200 |

## Peformance

| Test Item | Test Method | Procedure | Requirements |
|---|---|---|---|
| Temperature Coefficient of Resistance (TCR) | JIS C 5201 clause 4.8 | $TCR\ (ppm/^{\circ}C) = \frac{R2-R1}{R1\ (T2-T1)} \times 10^{6}$<br>R1：resistance of room temperature (T1)<br>R2：resistance of 150°C (T2) | Refer to Ratings |
| Short Time Overload | JIS C 5201 clause 4.13 | 3 times rated power for LR2512-3W, LR2728-3W, LR2728-3.5W<br>4 times rated power for LR1206-1W, LR2010-1W LR2512-2W, LR2725-4W, LR2728-4W, LR4527-5W<br>5 times rated power for LR2512-1W, LR2512-1.5W<br>Rating power duration: 5secs | ±(0.5%R0+0.0005Ω)△R |
| Insulation Resistance | JIS C 5201 clause 4.6 | 100±15VDC for 1 minute | $\geqq 10^{9}\Omega$ |
| Dielectric Withstanding Voltage | JIS C 5201 clause 4.7 | Applied 500VAC for 1 minute, and Limit surge current 50 mA (max.) | Without break down |
| Resistance to Solder Heat | JIS C 5201 clause 4.18 | Solder temp./immersion time: 260±5°C, 10±1secs and 350±10°C, 3.5±0.5secs | ±(0.5%R0+0.0005Ω)△R |
| Solderability Test | JIS C 5201 clause 4.17 | Specimen prep.: 4 hours ± 15 min. Steam Aging；Solder Bath/Dip and Look Test, 245±5°C,3±1 secs | 95% coverage |
| Vibration | JIS C 5201 clause 4.22 | Frequency varied 55Hz in one minute, 3 orientations @ Total duration 12 hours | ±(0.5%R0+0.0005Ω)△R |
| Resistance to Solvent | JIS C 5201 clause 4.29, 4.30 | Immersion time: 60±5 secs @ 20°C ~25°C | ±(0.5%R0+0.0005Ω)△R |
| Mechanical Shock | JIS C 5201 clause 4.21 | 100 grams for 6 milliseconds, 5 pulses | ±(0.5%R0+0.0005Ω)△R |
| Low Temperature Exposure (Storage) | JIS C 5201 clause 4.23.4 | 1,000 hours @ -55°C | ±(0.5%R0+0.0005Ω)△R |
| High Temperature Exposure (Storage) | JIS C 5201 clause 4.23.2 | 1,000 hours @ + 155°C | ±(1.0%R0+0.0005Ω)△R |
| Temperature Cycling (Rapid Temperature Change) | JIS C 5201 clause 4.19 | Air to air, - 55°C to + 150°C, 1,000 cycles, 15 minutes at each extreme, transition time 2 to 3 minutes | ±(0.5%R0+0.0005Ω)△R |
| Moisture Resistance (Climatic Sequence) | JIS C 5201 clause 4.23 | Mil-STD-202, Method 106, 0% power, 7a and 7b not required, t = 24h/cycle, 10 cycles, Unpowered, | ±(0.5%R0+0.0005Ω)△R |
| Bias Humidity | JIS C 5201 clause 4.24 | + 85°C, 85% RH, 10% Bias, Extended Life Test: 1,000 hours, 1.5 hours On, 0.5 hours Off | ±(0.5%R0+0.0005Ω)△R |
| Load Life | JIS C 5201 clause 4.25.1 | Test temperature 100 °C Rated continuous working voltage, Extended Life Test: 1,000 hours, 1.5 hours On， 0.5 hours Off | ±(1.0%R0+0.0005Ω)△R |

## Ordering Information

Example

| LR | 1206 | 1W | J | 0R002 | E | 04 |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Type | Size (inch) | Reatd Power | Resistance Tolerance | Reisitance | Package | Quantity |

(1)Type:LR

(2)Size:1206,2010,2512,2725,2728,4527

(3)Reatd power:1W,1.5W,2W,3W,3.5W,4W,5W

(4)Resistance Tolerance: D=±0.5%,F=±1%,G=±2%,J=±5%

(5)Reisitance:R0005=0.5mΩ,0R001=1mΩ,0R100=100mΩ,1R000=1Ω

(6)Package:E= Embossed taping

(7)Quantity:01=1000PCS,02=2000PCS,04=4000PCS