

Datasheet

RS Pro RS Series Thick Film Surface Mount Resistor 1206 Case $4.7\Omega \pm 5\%$ $0.25W \pm 200\text{ppm}/^\circ\text{C}$

RS Stock No: 713-1202



Product Details

RS Pro 1206 thick film surface mount resistor with $\pm 5\%$ tolerance, provides 4.7Ω resistance and is power rated at 0.25 W . The temperature coefficient of resistance is $\pm 200\text{ ppm}/^\circ\text{C}$. Applications include telecommunication equipment, radio and tape recorders, TV tuners, video cameras, watches, pocket calculators, automotive industry, computers, instruments, medical and military equipment.

Features and Benefits

- Small size and lightweight
- Highly reliable multilayer electrode construction
- Compatible with all soldering process

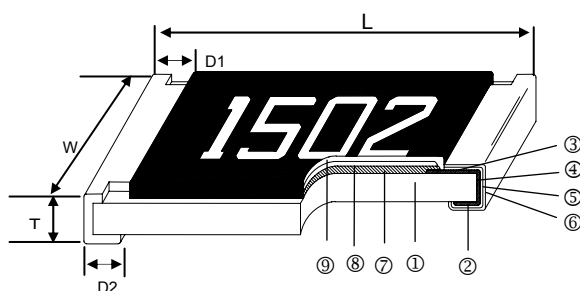
Specifications:

| | |
|---------------------------------|----------------------|
| Case Style | Ruthenium Oxide |
| Depth | 1.55 mm |
| Dimensions | 3.1 x 1.55 x 0.55 mm |
| Height | 0.55 mm |
| Length | 3.1 mm |
| Maximum Operating Temperature | +155°C |
| Maximum Temperature Coefficient | +200 ppm/°C |
| Minimum Operating Temperature | -55°C |
| Minimum Temperature Coefficient | -200 ppm/°C |
| Package/Case | 1206 |
| Power Rating | 0.25 W |
| Resistance | 4.7 Ω |
| Technology | Thick Film |
| Temperature Coefficient | ±200 ppm/°C |
| Termination Style | Solder Pad |
| Tolerance | ±5% |
| Maximum Operating Voltage | 200 V |
| Maximum Overload Voltage | 400 V |
| Tape Width | 8 mm |

Thick Film Chip Resistor 5% - RS Series

0201/0402/0603/0805/1206

Construction



| | | |
|-------------------------|---------------------------|---|
| ① Alumina Substrate | ④ Edge Electrode (NiCr) | ⑦ Resistor Layer (RuO ₂ /Ag) |
| ② Bottom Electrode (Ag) | ⑤ Barrier Layer (Ni) | ⑧ Primary Overcoat (Glass) |
| ③ Top Electrode (Ag-Pd) | ⑥ External Electrode (Sn) | ⑨ Secondary Overcoat (Epoxy) |

Dimensions

Unit: mm

| Type | Size (Inch) | L | W | T | D1 | D2 | Weight (g) (1000pcs) |
|---------|-------------|-----------|-----------|-----------|-----------|-----------|----------------------|
| RS-0201 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.23±0.03 | 0.15±0.05 | 0.15±0.05 | 0.150 |
| RS-0402 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.35±0.05 | 0.20±0.10 | 0.20±0.10 | 0.620 |
| RS-0603 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.30±0.20 | 2.042 |
| RS-0805 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.50±0.10 | 0.35±0.20 | 0.40±0.20 | 4.368 |
| RS-1206 | 1206 | 3.10±0.10 | 1.55±0.10 | 0.55±0.10 | 0.50±0.25 | 0.50±0.20 | 8.947 |

Part Numbering

| | | | | |
|-----|--------------------------------------|--|-----------|------------------------------------|
| RS- | 0402- | 10R- | 5%- | 0.0625W |
| | Dimensions | Resistance | Tolerance | Power Rating @ 70 °C |
| | 0201 0402 0603 0805 1206 | 10R: 10Ω 100R: 100Ω 10K: 10KΩ 100K: 100KΩ | 5% | 0.0625W 0.1W 0.125W 0.25W |

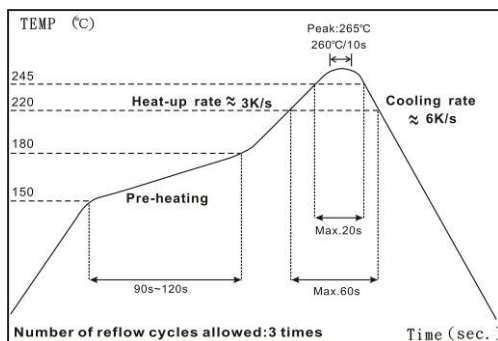
Derating Curve



Standard Electrical Specifications

| Item Type | Power Rating at 70°C Jumper Rated Current | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Resistance Range | TCR (PPM/°C) |
|--------------|---|-----------------------|------------------------|-----------------------|------------------|--------------|
| | | | | | ±5% | |
| RS-0201 | 1/20W | -55 ~ +155°C | 25V | 50V | 1Ω – 9.76MΩ | ±200 |
| Jumper | 1A | | | | 0Ω (<50mΩ) | - |
| RS-0402 | 1/16W | -55 ~ +155°C | 50V | 100V | 1Ω – 9.76MΩ | ±200 |
| Jumper | 1A | | | | 0Ω (<50mΩ) | - |
| RS-0603 | 1/10W | -55 ~ +155°C | 75V | 150V | 1Ω – 9.76MΩ | ±200 |
| Jumper | 1A | | | | 0Ω (<50mΩ) | - |
| RS-0805 | 1/8W | -55 ~ +155°C | 150V | 300V | 1Ω – 9.76MΩ | ±200 |
| Jumper | 2A | | | | 0Ω (<50mΩ) | - |
| RS-1206 | 1/4W | -55 ~ +155°C | 200V | 400V | 1Ω – 9.76MΩ | ±200 |
| Jumper | 2A | | | | 0Ω (<50mΩ) | - |

Soldering Condition



IR Reflow Soldering

- (1) Time of IR reflow soldering at maximum temperature point 260°C: 10s
- (2) Time of wave soldering at maximum temperature point 260°C: 10s
- (3) Time of soldering iron at maximum temperature point 410°C: 5s

Wave Soldering (Flow Soldering)



■ Environmental Characteristics

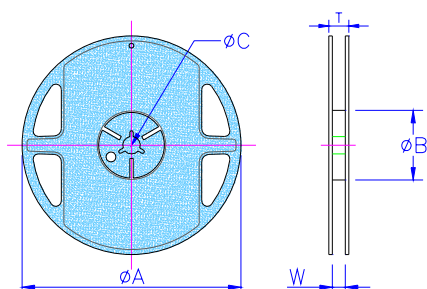
| Item | Requirement | | Test Method |
|--|---|--------|---|
| | ±5% | Jumper | |
| Temperature Coefficient of Resistance (T.C.R.) | As Spec. | | JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C~+125/+155°C, 25°C is the reference temperature |
| Short Time Overload | ±(2.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. overload voltage for 5 seconds, 2 seconds for high power series |
| Insulation Resistance | ≥10G | | JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. overload voltage for 1 minute |
| Endurance | ±(3.0%+0.10Ω) | <100mΩ | JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Damp Heat with Load | ±(3.0%+0.10Ω) | <100mΩ | JIS-C-5201-1 4.24 40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Dry Heat | ±(1.5%+0.10Ω) | <50mΩ | JIS-C-5201-1 4.23 IEC-60115-1 2.23.2 at +125/+155°C for 1000 hrs |
| Bending Strength | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm |
| Solderability | 95% min. coverage | | JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds |
| Voltage Proof | No breakdown or flashover | | JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times RCWV (RMS) for 1 minute |
| Leaching | Individual leaching area □5% Total leaching area □ 10% | | JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds |
| Rapid Change of Temperature | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.18 IEC-60115-1 4.18 -55°C to +125/+155°C, 5 cycles |

■ Storage Temperature: 25±3°C; Humidity < 80%RH

Packaging

ENGLISH

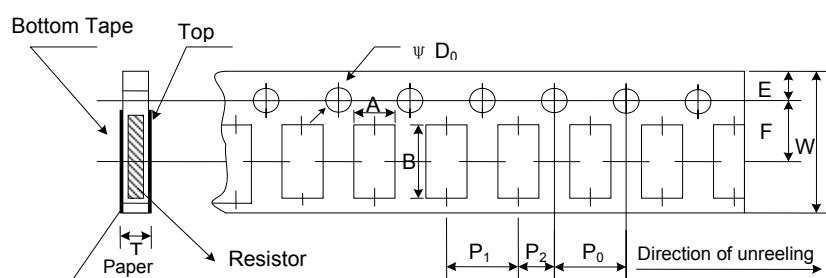
Reel Specifications & Packaging Quantity



Unit: mm

| Type | Packaging Quantity | Tape Width | Reel Diameter | ΦA | ΦB | ΦC | W | T |
|-------------------------------|--------------------|------------|---------------|-----------|---------------------|----------|---------|----------|
| RS-0201 RS-0402 | Paper | 8mm | 7 inch | 178.5±1.5 | 60 ^{+1/-0} | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 |
| RS-0603 RS-0805 RS-1206 | | | 10 inch | 254±1 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |
| | | | 13 inch | 330±1 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |

Paper Tape Specifications



Unit: mm

| Type | A | B | W | E | F | P ₀ | P ₁ | P ₂ | ΦD ₀ | T |
|---------|-----------|-----------|---------|----------|-----------|----------------|----------------|----------------|-----------------|----------|
| RS-0201 | 0.38±0.05 | 0.68±0.05 | 8.0±0.2 | 1.75±0.1 | 3.50±0.05 | 4.00±0.10 | 2.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.42±0.1 |
| RS-0402 | 0.65±0.10 | 1.15±0.1 | 8.0±0.2 | 1.75±0.1 | 3.50±0.05 | 4.00±0.10 | 2.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.45±0.1 |
| RS-0603 | 1.10±0.10 | 1.90±0.1 | 8.0±0.2 | 1.75±0.1 | 3.50±0.05 | 4.00±0.10 | 4.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.70±0.1 |
| RS-0805 | 1.60±0.10 | 2.40±0.2 | 8.0±0.2 | 1.75±0.1 | 3.50±0.05 | 4.00±0.10 | 4.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.85±0.1 |
| RS-1206 | 1.90±0.10 | 3.50±0.2 | 8.0±0.2 | 1.75±0.1 | 3.50±0.05 | 4.00±0.10 | 4.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.85±0.1 |



■ **Marking**

No Marking for 0201 and 0402

Jumper for all: Letter "0"

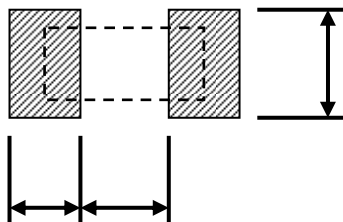
5% for 0603/0805/1206: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| E24 code | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

■ **Recommend Land Pattern**

Unit: mm



| Type | A | B | C |
|---------|------|------|------|
| RS-0201 | 0.30 | 0.25 | 0.30 |
| RS-0402 | 0.50 | 0.45 | 0.60 |
| RS-0603 | 0.90 | 0.60 | 0.90 |
| RS-0805 | 1.20 | 0.70 | 1.30 |
| RS-1206 | 2.00 | 0.90 | 1.60 |