

Data Sheet

Customer :

Product : Four Terminal High Precision Current Sense Resistors – 4T Series

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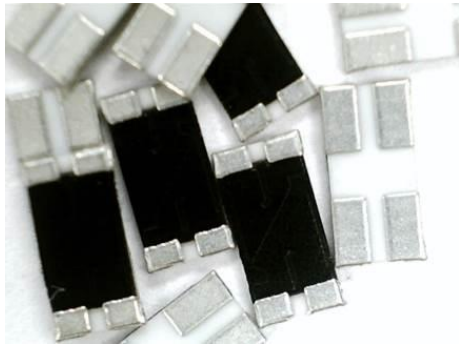
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Four Terminal High Precision Current Sense Resistors (4T Series)



■ Features

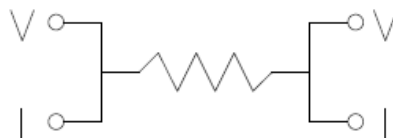
- SMD Type designed for automatic insertion
- High power rating in small size
- Metal foil construction ensures high reliability and performance with very low and stable TCR
- Design for current sense circuits in power electronic systems
- Industry standard sizes

■ Applications

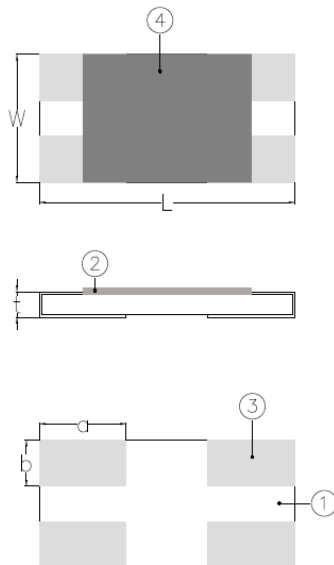
- Power Management Applications
- Switching Power Supply
- Over Current Protection in Audio Applications
- Voltage Regulation Module (VRM)
- DC-DC Converter, Battery Pack, Charger, Adaptor
- Disk Driver
- Portable Devices (PDA, Cell Phone)

■ Schematic diagram

- V = voltage terminal
- I = current terminal



■ Construction



| | |
|---------------------|-------------------|
| ① Alumina Substrate | ④ Protection coat |
| ② Resistor Layer | |
| ③ Electrode | |

■ Dimensions

Unit: mm

| Type | Size (Inch) | L | W | T | a | b | Weight (g) (1000pcs) |
|------|-------------|---------|---------|----------|---------|----------|----------------------|
| 4T06 | 1206 | 3.0±0.2 | 1.6±0.2 | 0.5±0.15 | 1.0±0.2 | 0.55±0.2 | 10 |
| 4T10 | 2010 | 5.0±0.2 | 2.5±0.2 | 0.5±0.15 | 1.7±0.2 | 0.9±0.2 | 29 |

Part Numbering

| | | | | | | | |
|--------------|----------------------|--|---------------------------|-----------------------------|--------------------|-------------|-----------------------------|
| 4T | 06 | D | T | W | U | R010 | N |
| Product Type | Dimensions (LxW) | Resistance Tolerance | Packaging Code | TCR (PPM/°C) | Power Rating | Resistance | Marking Code |
| | 06: 1206 10: 2010 | D: ±0.5% F: ±1% G: ±2% J: ±5% | T: Taping Reel B: Bulk | D: ±50 W: ±75 E: ±100 | Q: 3/4W U: 1/2W | R010: 0.01Ω | : Standard N: No Marking |

Standard Electrical Specifications

| Item Type | Power Rating at 70°C | Operating Temp. Range | Resistance Range (mΩ) | | | | TCR (PPM/°C) |
|--------------|----------------------|-----------------------|-----------------------|-----|-----|-----|--------------------|
| | | | ±0.5% | ±1% | ±2% | ±5% | |
| 4T06 (1206) | 1/2W | -55 ~ +155°C | 10 – 20 | | | | ±50 ±75 ±100 |
| 4T10 (2010) | 3/4W | -55 ~ +155°C | 10 – 20 | | | | ±50 ±75 ±100 |

Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.
 Overload Voltage= $1.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.
 ■ Viking is capable of manufacturing the optional spec based on customer's requirement.

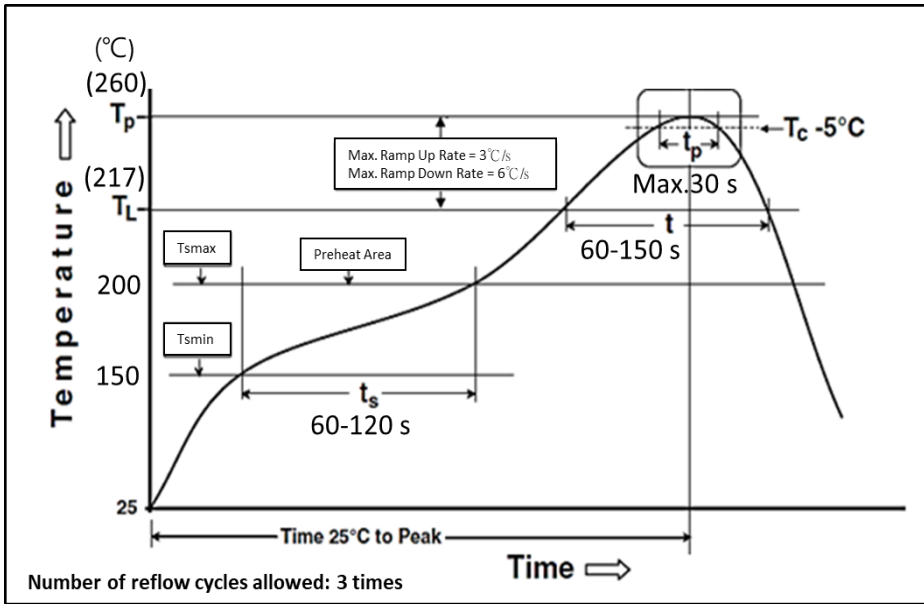
Environmental Characteristics

| Item | Requirement | Test Method |
|--|-------------------|---|
| Temperature Coefficient of Resistance (T.C.R.) | As Spec. | +25/-55/+25/+125/+25°C |
| Short Time Overload | ±(0.5%+0.0005Ω) | RCWV*1.5 for 5 seconds |
| Insulation Resistance | >1000MΩ | Apply 100V _{DC} for 1 minute |
| Endurance | ±(0.5%+0.0005Ω) | 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Damp Heat with Load | ±(0.5%+0.0005Ω) | 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Bending Strength | ±(0.5%+0.0005Ω) | Bending amplitude 3 mm for 10 seconds |
| Solderability | 95% min. coverage | 245±5°C for 3 seconds |
| Dielectric Withstand Voltage | By Type | Apply Max. Overload Voltage for 1 minute |
| Resistance to Soldering Heat | ±(0.5%+0.0005Ω) | 260±5°C for 10 seconds |
| Rapid change of temperature | ±(0.5%+0.0005Ω) | -55°C ~155°C, 5 cycles |

RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower

- Reference Standards: MIL-STD-202, JIS-C 5201
- Storage Temperature: 15~28°C; Humidity < 80%RH
- Shelf Life: 2 years from production date.

■ Soldering Condition(IPC/JEDEC J-STD-020)

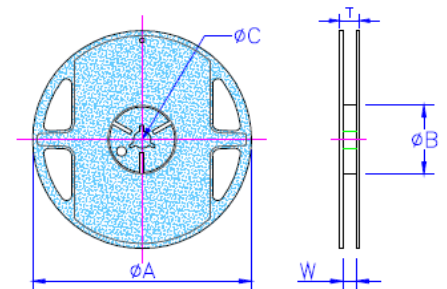


■ Packaging

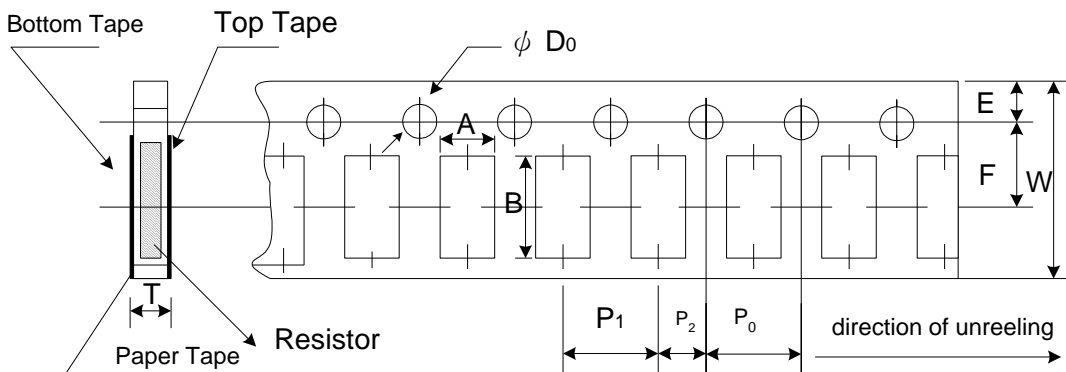
Packing Quantity & Reel Specifications

Unit :mm

| Type | ØA | ØB | ØC | W | T | Paper Tape (EA) | Emboss Plastic Tape (EA) |
|------|-----------|----------|----------|----------|----------|-----------------|--------------------------|
| 4T06 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 5,000 | |
| 4T10 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 13.5±1.0 | 15.5±1.0 | - | 4,000 |



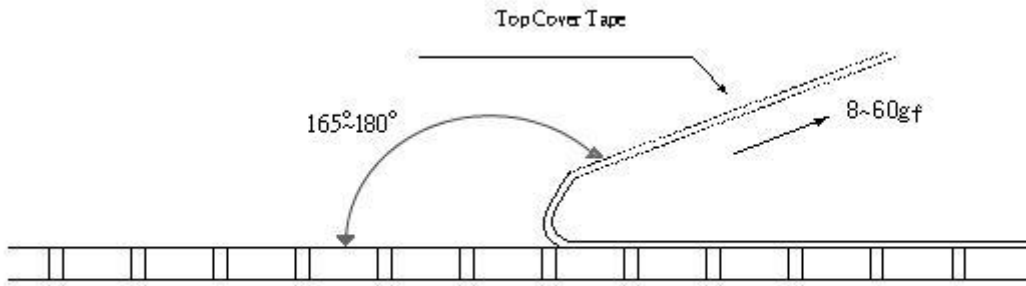
Paper Tape Specifications



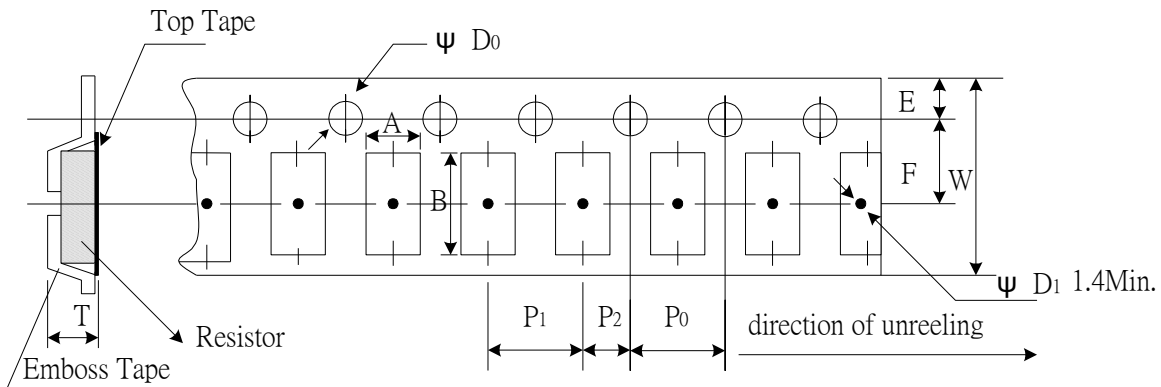
Unit: mm

| Type | A | B | W | E | F | P ₀ | P ₁ | P ₂ | ΦD ₀ | T |
|------|-----------|-----------|-----------|-----------|----------|----------------|----------------|----------------|-----------------|-----------|
| 4T06 | 2.00±0.05 | 3.55±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.55±0.05 | 0.75±0.05 |

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8gf to 60gf



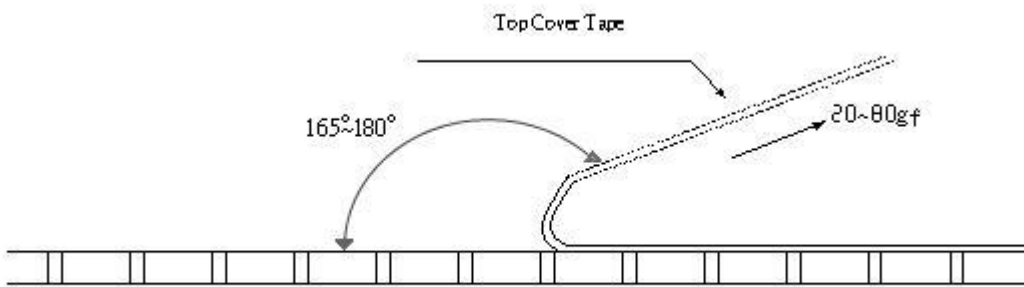
Emboss Plastic Tape Specifications



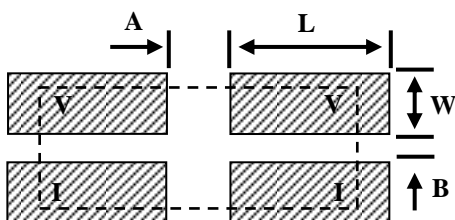
Unit: mm

| Type | A | B | W | E | F | P ₀ | P ₁ | P ₂ | ØD ₀ | T |
|------|-----------|-----------|-----------|-----------|----------|----------------|----------------|----------------|-----------------|-----------|
| 4T10 | 2.85±0.10 | 5.45±0.10 | 12.0±0.10 | 1.75±0.10 | 5.5±0.05 | 4.00±0.05 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 1.00±0.20 |

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 20gf to 80gf



Recommend Land Pattern



Unit: mm

| Type | L | W | A | B |
|------|------|------|------|------|
| 4T06 | 1.75 | 1.10 | 1.00 | 0.30 |
| 4T10 | 2.55 | 1.55 | 1.40 | 0.50 |