

Data Sheet

Customer:

Product: Automotive Grade Current Sensing Thin Film Chip Resistor – CSTF..A Series

Size: 1206

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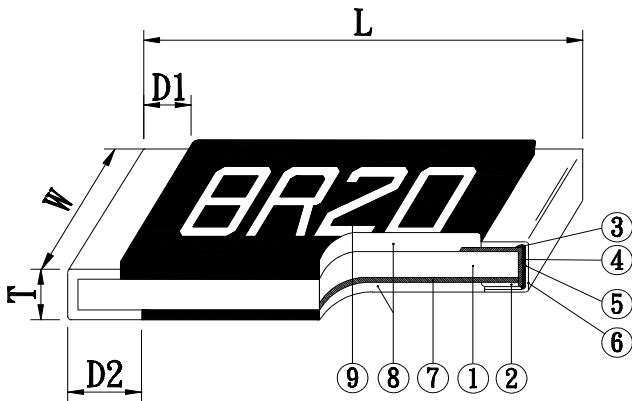
Automotive Grade Current Sensing Thin Film Chip Resistor



■ Features

- AEC-Q200 Qualified
- Highly reliable multilayer electrode construction
- Reduced size of final equipment reliability
- Low TCR of ± 50 PPM/ $^{\circ}$ C
- Resistance values from 1 to 10 ohm
- High purity alumina substrate for high power dissipation
- RoHS Compliance
- 100% CCD inspection
- MSL: Level 1

■ Construction



■ Applications

- Automotive Industry
- Power Management Applications
- Switching Power Supply
- Over Current Protection in Audio Applications
- Voltage Regulation Module (VRM)
- DC-DC Converter, Battery Pack, Charger, Adaptor
- Automotive Engine Control
- Disk Driver

| | | |
|---------------------|----------------------|------------------|
| ① Alumina Substrate | ④ Edge Electrode | ⑦ Resistor Layer |
| ② Bottom Electrode | ⑤ Barrier Layer | ⑧ Overcoat |
| ③ Top Electrode | ⑥ External Electrode | ⑨ Marking |

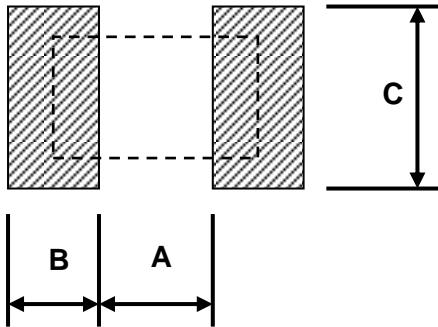
■ Dimensions

| Type | Size (Inch) | L (mm) | W (mm) | T (mm) | D1 (mm) | D2 (mm) | Weight (g) (1000pcs) |
|--------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------|
| CSTF06 | 1206 | 3.10 \pm 0.10 | 1.55 \pm 0.10 | 0.55 \pm 0.10 | 0.40 \pm 0.25 | 0.40 \pm 0.25 | 9.2 |

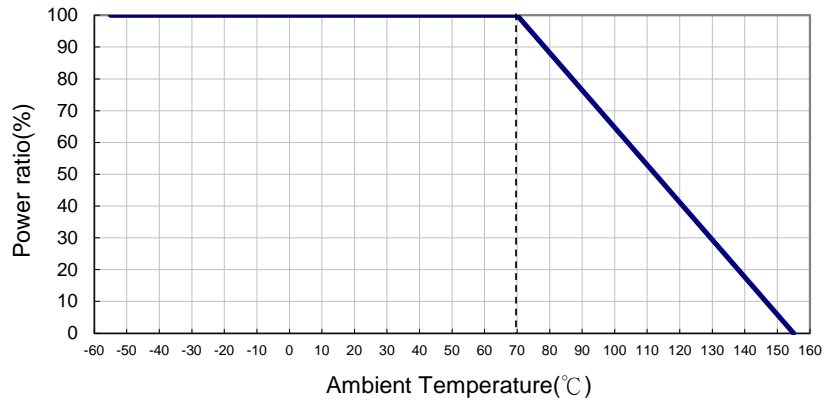
■ Part Numbering

| | | | | | | | |
|--------------|------------------|--|----------------|-----------------------------|------------------|---|---------------------|
| CSTF | 06 | F | T | D | U | 0010 | A |
| Product Type | Dimensions (LxW) | Resistance Tolerance | Packaging Code | TCR (PPM/ $^{\circ}$ C) | Power Rating | Resistance | Marking |
| | 06: 1206 | F: $\pm 1\%$ G: $\pm 2\%$ J: $\pm 5\%$ | T: Taping Reel | D: ± 50 E: ± 100 | T: 1W U: 1/2W | 0010: 1 Ω 4R70: 4.7 Ω 0100: 10 Ω | A: Automotive Grade |

Recommend Land Pattern



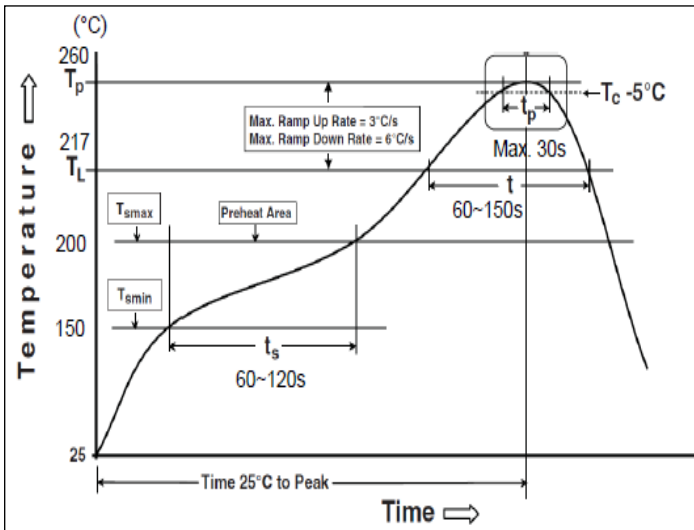
Derating Curve



Pad Layout

| Type | A (mm) | B (mm) | C (mm) |
|--------|--------|--------|----------|
| CSTF06 | 2.00 | 1.15 | 1.70±0.2 |

Soldering Condition (Ref. IPC/JEDEC J-STD-020 & J-STD-002)



| Reflow Profiles | |
|--|------------------|
| Profile Feature | Pb-Free Assembly |
| Preheat | |
| Min. Temperature (T _{min}) | 150 °C |
| Max Temperature (T _{max}) | 200 °C |
| Preheating time (t _s) from (T _{min} to T _{max}) | 60-120 seconds |
| Ramp-up rate (T _L to T _p) | 3 °C/second max. |
| Liquidous temperature (T _L) | 217 °C |
| Time (t _L) maintained above T _L | 60-150 seconds |
| Min. Peak temperature (T _p min) | 235°C |
| Max. Peak temperature (T _p max) | 260°C |
| Time (t _p) within 5 °C of the specified classification temperature (T _c) | 30 seconds max. |
| Ramp-down rate (T _p to T _L) | 6 °C/second max. |
| Time 25 °C to peak temperature | 8 minutes max. |

Electrical Specifications

| Type | Item | Power Rating at 70°C | Operating Temp. Range | Max. Operating Current | Resistance Range | | | TCR (PPM/°C) |
|---------------|------|----------------------|-----------------------|------------------------|------------------|-----------|-----------|--------------|
| | | | | | ±1% (E24 · E96) | ±2% (E24) | ±5% (E24) | |
| CSTF06 (1206) | | 1/2W | -55 ~ +155°C | 0.707A | 1Ω - 10Ω | | | ±50 ±100 |
| | | 1W | | 1A | | | | |

Operating Voltage= $\sqrt{P \cdot R}$; Operating Current= $\sqrt{P/R}$

■ 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. | JIS C 5201-1 4.8 IEC 60115-1 4.8 At 25°C/+125°C, 25°C is the reference temperature |
| Short Time Overload | ±(1.0%+0.05Ω) | JIS C 5201-1 4.13 IEC 60115-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds |
| Insulation Resistance | ≥ 10G | JIS C 5201-1 4.6 IEC 60115-1 4.6 Max. Overload Voltage for 1 minute |
| Operational Life(Endurance) | ±(1.0%+0.05Ω) | JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF” |
| Biased Humidity | ±(0.5%+0.05Ω) | MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power(≤100V). |
| High Temperature Exposure | ±(1.0%+0.05Ω) | MIL-STD-202 Method 108 at +155°C for 1000 hrs |
| Board Flex | ±(1.0%+0.05Ω) | AEC-Q200-005 Bending once for 60 seconds |
| Solderability | 95% min. coverage | JIS C 5201-1 4.17 IEC 60115-1 4.17 J-STD-002 245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±(0.5%+0.05Ω) | MIL-STD-202 Method 210 260±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 Max. Operating Voltage for 1 minute CSTF06:400V |
| 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 |
| Temperature Cycling | ±(1.0%+0.05Ω) | JESD22 Method JA-104 -55°C to +155°C, 1000 cycles |
| Mechanical Shock | ±(0.25%+0.05Ω) | MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6. |
| Vibration | ±(0.5%+0.05Ω) | MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz |
| ESD | ±(1.0%+0.05Ω) | AEC-Q200-002 Human body, 2KV |
| Resistance to Solvents | No visible damage on appearance and marking. | MIL-STD-202 Method 215 Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents. |
| Terminal Strength | No broken | AEC-Q200-006 Force of 1.8kg for 60 seconds. |
| Flammability | No ignition of the tissue paper or scorching or the pinewood board | UL-94 V-0 or V-1 are acceptable. Electrical test not required. |

| Item | Requirement | Test Method |
|-------------|--------------------|--|
| Sulfur Test | $\Delta R \pm 1\%$ | EIA-977 (Condition A) 60±2°C, no power rating for 500 hrs. |

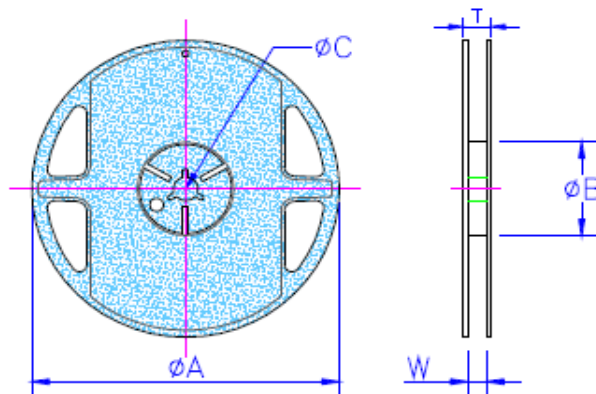
RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

■ **Storage Temperature: 15~28°C; Humidity < 80%RH**

■ **Shelf Life: 2 years from production date.**

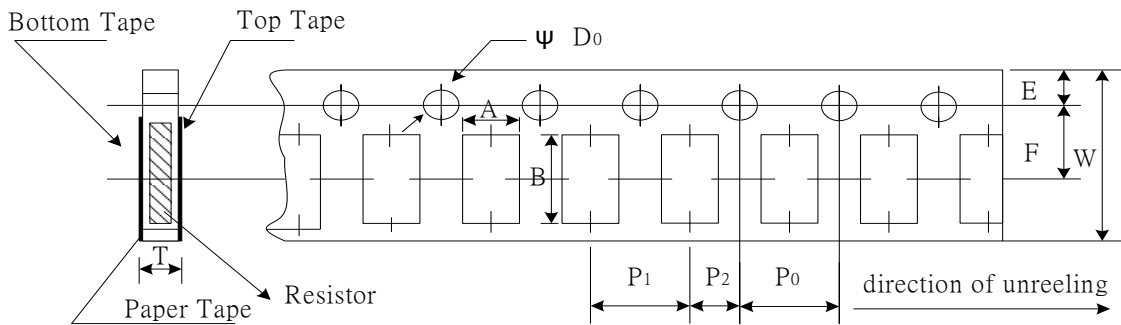
■ **Packaging**

Packaging Quantity & Reel Specifications



| Type | ΦA (mm) | ΦB (mm) | ΦC (mm) | W (mm) | T (mm) | Paper Tape (EA) |
|--------|-----------|----------|----------|---------|----------|-----------------|
| CSTF06 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±0.1 | 11.5±1.0 | 5,000 |

Paper Tape Specifications



| Type | A (mm) | B (mm) | W (mm) | E (mm) | F (mm) | P0 (mm) | P1 (mm) | P2 (mm) | ΦD ₀ (mm) | T (mm) |
|--------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|----------------------|-----------|
| CSTF06 | 1.90±0.10 | 3.50±0.20 | 8.0±0.20 | 1.75±0.10 | 3.50±0.05 | 4.00±0.10 | 4.00±0.05 | 2.00±0.05 | 1.50+0.1,-0 | 0.85±0.10 |

■ **Marking**

1%, 5% for 1206: 4 digits marking

Example:

| | | | |
|------------|------|------|------|
| Resistance | 1Ω | 4.7Ω | 10Ω |
| Marking | 1R00 | 4R70 | 10R0 |

REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------|--------------|---------------------|-----------------------|
| Version A | Nov 07, 2025 | - | - New product release |