



## Features

- Up to 50 W permanent power
- High pulse power rating
- Maximum fastening torque: 10 Nm
- Tinned terminals
- Customized versions available
- AEC-Q200 and RoHS\* compliant

## Applications

- Current sensing for hybrid & electric vehicles - Battery management systems
- Current sensing in bus bars
- Current sensing in welding equipment
- Frequency converters

## Model CSM2F-7036 Series Current Sense Resistor

### Electrical Characteristics

| Characteristic                            | Model CSM2F-7036 Series |
|---|-------------------------|
| Resistance Range / Power Rating @ 70 °C** | 50 MicroOhms / 50 Watts |
| Operating Temperature Range               | -40 °C to +170 °C       |
| TCR on Test Points                        | ±150 PPM/°C             |
| TCR Resistance Alloy***                   | < 50 PPM/°C             |
| Thermal EMF (µV/K)                        | < 0.25 for 50 MicroOhms |
| Resistance Tolerance                      | ±5 %                    |

\*\* Terminal temperature

\*\*\* For full TCR range, refer to TCR curve.

### How to Order

**CSM 2F - 7036 - L050 J 01**

Model \_\_\_\_\_

No. of Terminals & Style \_\_\_\_\_

Size (Metric) \_\_\_\_\_

Resistance Code (Milliohms) \_\_\_\_\_

"L" Represents Decimal Point  
L050 = 50 MicroOhms

Resistance Tolerance \_\_\_\_\_

J = ±5 %

Packaging \_\_\_\_\_

01 = Bulk Pack (50 pcs. per bag)  
T1 = Tray Pack (28 pcs. per tray)

### Environmental Characteristics

| Characteristic               | Test Condition                                 | ΔTR Max.           |
|------------------------------|--|--------------------|
| Thermal Shock                | -55 to +150 °C / 1000 cycles                   | ±1.0 %             |
| Resistance to Soldering Heat | +260 °C / 10 seconds                           | ±0.5 %             |
| High Temperature Exposure    | +170 °C / 1000 hours                           | ±1.5 %             |
| Low Temperature Storage      | -65 °C / 24 hours                              | ±0.5 %             |
| Biased Humidity Test         | +85 °C, 85 % RH, 10 % bias, 1000 hours         | ±0.5 %             |
| Mechanical Shock             | 100 g, 6 milliseconds, 5 pulses                | ±0.5 %             |
| Vibration, High Frequency    | 10-2000 Hz in 1 minute, 3 directions, 12 hours | ±0.5 %             |
| Load Life                    | 1000 hours at max. load, derated at 125 °C     | ±1.0 %             |
| Solderability                | J-STD-002                                      | 95 % coverage min. |
| Short time Overload          | 5 times rated power for 5 seconds              | ±0.5 %             |

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\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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Technical drawing of a rectangular component with dimensions and tolerances. The drawing includes a top view and a side view.

**Top View Dimensions:**

- Overall width:  $50.00 \pm 0.20$  (1.969  $\pm$  0.008)
- Overall height:  $36.00 \pm 0.20$  (1.417  $\pm$  0.008)
- Left chamfer:  $45^\circ \times 5.0$  (0.197) CHAMFER 1 PLACE
- Right chamfer:  $45^\circ \times 2.0$  (0.079) CHAMFER TYP. 3 PLCS.
- Top center feature: OPTIONAL TRIMMING 2 PLCS. with a width of  $9.40$  (0.370)
- Bottom center feature:  $12.57 \pm 0.15$  (0.495  $\pm$  0.006)
- Left circular feature:  $8.50 \pm 0.15$  (0.335  $\pm$  0.006) DIA. 2 PLCS.
- Right circular feature:  $12.57 \pm 0.15$  (0.495  $\pm$  0.006)
- Material: BASE MATERIAL C10200 (NOTE 1)
- Voltage test points are indicated on the top surface.

**Side View Dimensions:**

- Overall length:  $70.00 \pm 0.40$  (2.756  $\pm$  0.016)
- Left thickness:  $2.00$  (0.079)
- Right thickness:  $3.00$  (0.118)
- Resistive material is indicated on the bottom surface.

**Dimensions:** MM (INCHES)

**Tolerances:** 0.25 (0.010) UNLESS OTHERWISE NOTED

1. Tinned Terminals: 100 % Sn, RoHS Complaint, JESD201 Class-2, ST200 Process, 2.5 -8 micrometers, NI underplate 1.5- 4 micrometers.
2. Base Material Copper: C10200 Temper 1/2 Hard.

**Temperature Dependence for Resistive Material**

The graph plots the relative change in resistance,  $dR / R_{25} (\%)$ , against temperature in degrees Celsius. The solid line represents the material's resistance change, while the dashed lines define the  $\pm 50$  PPM tolerance band.

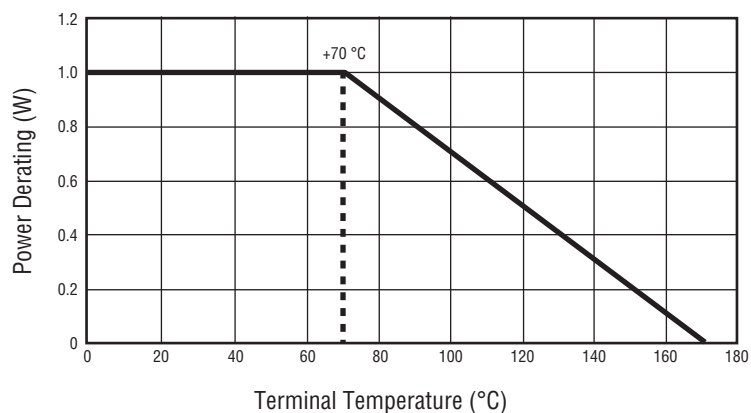
| Temperature (°C) | Material Chart $dR / R_{25} (\%)$ | +50 PPM Tolerance $dR / R_{25} (\%)$ | -50 PPM Tolerance $dR / R_{25} (\%)$ |
|------------------|-----------------------------------|--------------------------------------|--------------------------------------|
| -50              | -0.55                             | -0.50                                | -0.45                                |
| -40              | -0.45                             | -0.40                                | -0.35                                |
| -30              | -0.35                             | -0.30                                | -0.25                                |
| -20              | -0.25                             | -0.20                                | -0.15                                |
| -10              | -0.15                             | -0.10                                | -0.05                                |
| 0                | -0.05                             | -0.05                                | -0.05                                |
| 10               | 0.05                              | -0.05                                | -0.15                                |
| 20               | 0.10                              | -0.10                                | -0.20                                |
| 30               | 0.12                              | -0.15                                | -0.25                                |
| 40               | 0.13                              | -0.20                                | -0.30                                |
| 50               | 0.14                              | -0.25                                | -0.35                                |
| 60               | 0.14                              | -0.30                                | -0.40                                |
| 70               | 0.13                              | -0.35                                | -0.45                                |
| 80               | 0.12                              | -0.40                                | -0.50                                |
| 90               | 0.11                              | -0.45                                | -0.55                                |
| 100              | 0.10                              | -0.50                                | -0.60                                |
| 110              | 0.09                              | -0.55                                | -0.65                                |
| 120              | 0.08                              | -0.60                                | -0.70                                |
| 130              | 0.07                              | -0.65                                | -0.75                                |
| 140              | 0.06                              | -0.70                                | -0.80                                |
| 150              | 0.05                              | -0.75                                | -0.85                                |
| 160              | 0.04                              | -0.80                                | -0.90                                |
| 170              | 0.03                              | -0.85                                | -0.95                                |

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## Model CSM2F-7036 Series Current Sense Resistor

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### Power Derating Curve



### General Specifications

Moisture Sensitivity Level ..... 1  
ESD Classification ..... Level 6  
per AEC-Q200-002,  
≥ 25,000 V air discharge

### Packaging Specifications

Standard Bulk Pack  
..... 50 pcs. per plastic bag;  
100 pcs. per box  
Tray Pack ..... 28 pcs. per high impact  
polystyrene tray;  
140 pcs. per box

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