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# (FLU) Alloy Sampling Shunt Current Sensing Resistors


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# Product Introduction

## "Stamping type" (FLU) precision sampling resistor provides up to 7W power and a TCR as low as 40ppm.

**Features :**

- Tolerance ±1%,±2% and ±5%.
- Low resistance 0.1mΩ to 10mΩ.
- Rated Power 1W ~ 7W with low inductance.
- Sustain high temperature.

**Applications :**

- Power Electronic.Home Appliance.
- Current Sensing.Communication System.
- Automotive electronics.Drive technology.

Achieving the best detection results in the smallest space is one of the most common requirements of electronic design engineers for circuit systems. This is the advantage of the Token Electronics' stamping sampling shunt resistor technology.

Stamping type shunt resistor is also known as current detection alloy resistor, current sensing resistor, sampling shunts, current induction shunts.

The sampling resistance is divided into current sampling and voltage sampling. For current sampling, a resistor with smaller resistance value is connected in series, while for voltage sampling, a resistor with larger resistance value is connected in parallel. The function of sampling resistance is to convert current into voltage signal for current measurement. In the actual circuit, it is connected in series with the load resistor.

Designated the (FLU) through-hole devices offer a high current, flameproof alternative to conventional axial devices and flat chips for current-sense circuits where PC board space is at a premium. The open air resistor's footprint is reduced by extending the height of the device above the board, thus keeping the resistor element's "hot spot" safely off the PC board and providing for increased air circulation under it, which in turn provides increased heat dissipation and cooler operation. The structure adopts advanced alloy stamping and features high temperature resistance with low inductance.

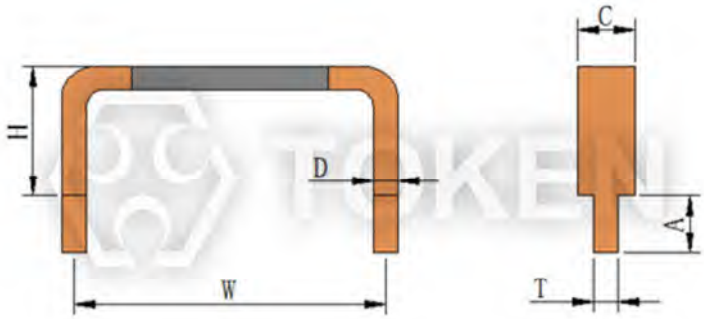
The (FLU) offers a higher current load than conventional axial resistors and SMD resistors, with a wide range pitch of radial pins to choose from. Its rated power can be up to 1W ~7W, temperature coefficient as low as ±40ppm/°C, resistance tolerance accuracy ±1%, ±2%, and ±5%, resistance range as low as 0.1mΩ to 10mΩ.

The Low Ohmic Alloy Shunts (FLU) are available in bulk packaging and is RoHS compliant and lead free. For non-standard technical requirements and special applications, contact us with your specific needs.Or link to Token official website "**Current Sense Resistors**". Contact us with your specific needs.

# Dimensions

## Dimensions - FLU (Unit：mm)

| Resistance (mΩ) | W (mm) | C (mm) | D (mm) | H (mm) | A (mm) | T (mm) |
|---|---|---|---|---|---|---|
| **0.1~10** | 5~30 | 10~35 | 0.3~3 | 5~30 | 4±0.2 | 1.0±0.2<br>1.5±0.2 |

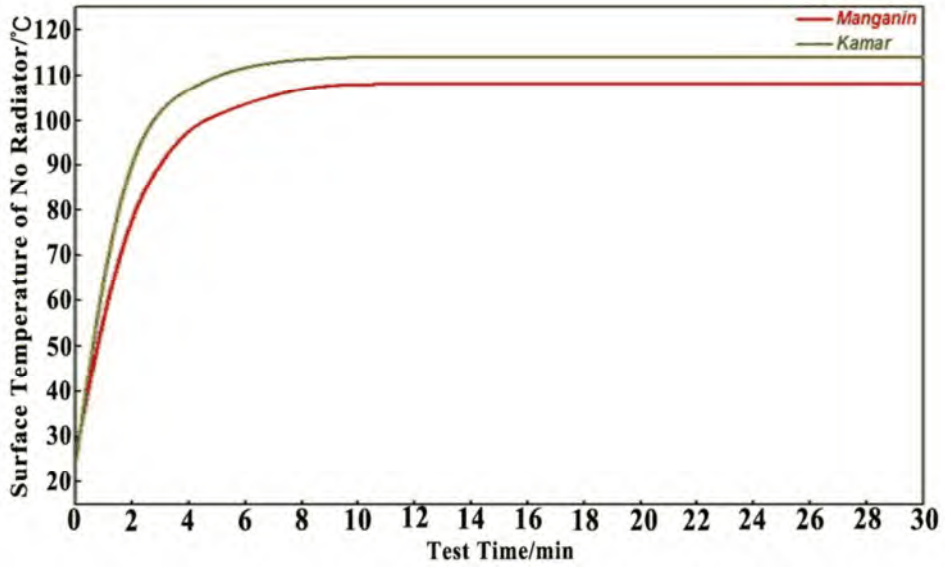



**Alloy Current Sensing Resistors (FLU) Dimensions**

- **Note: For non-standard dimensions of pins (A and T), Pitch (W), and Height (H) and variations of Rated current can be on request.**

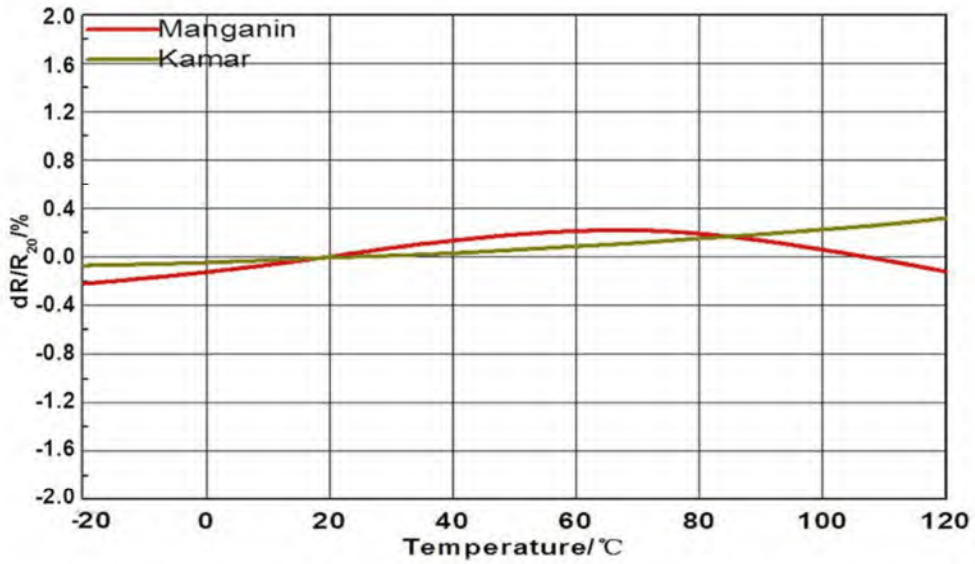
# Technical Specifications

## Surface Temperature Curve - FLU




(FLU) Surface Temperature Curve

## TCR Derating Curve - FLU




(FLU) TCR Derating Curve

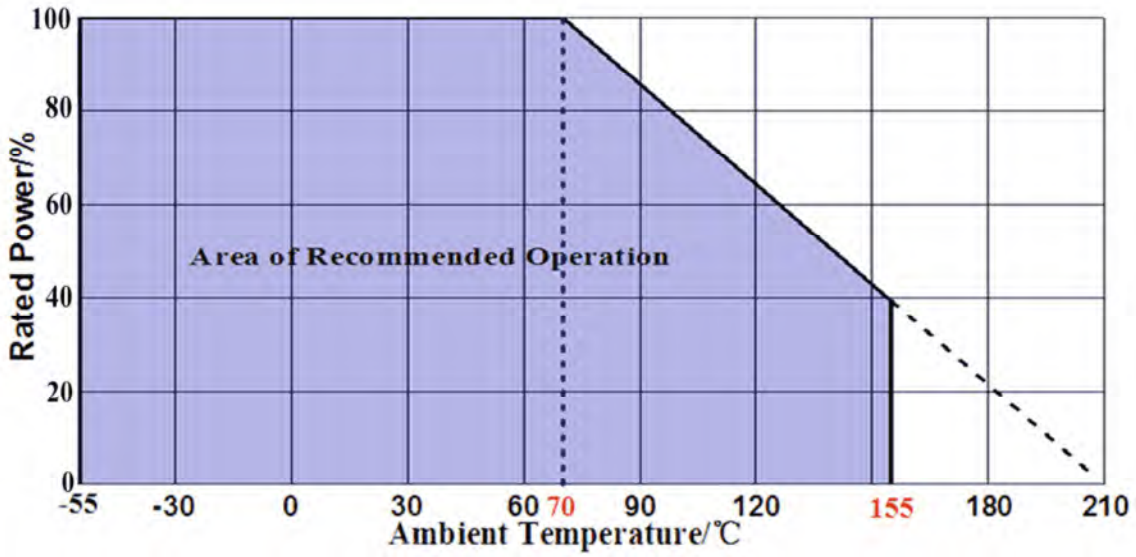
# Environmental Characteristics

## Environmental Characteristics - FLU

| Items | Methods | Requirement |
|---|---|---|
| **Temperature Cycling** | MIL-STD-202<br>1000 Cycles (-55°C to +125°C). Measurement at 24±2 hours after. | ±0.5% |
| **High Temperature** | MIL-STD-202<br>1000hrs. @T=125°. Unpowered. Measurement at 24±2 hours after. | ±0.5% |
| **Moisture Resistance** | MIL-STD-202<br>t=24 hrs/cycle.<br>Note:Steps 7a & 7b not required. Measurement at 24±2 hours after. | ±0.5% |
| **Biased Humidity** | MIL-STD-202<br>1000hrs 85°C/85% RH.<br>Note: Specified conditions: 10% of operating power. Measurement at 24±2 hours after. | ±0.5% |
| **Operational Life** | MIL-STD-202<br>Condition D Steady State TA=125°C at rated power. Measurement at 24±2 hours after. | ±0.5% |
| **Solderability** | J-STD-002C<br>245°C±5°C, 5s+0.5s/-0. | 95% Coverage Minimum. |
| **Vibration** | MIL-STD-202<br>5g's for 20 min, 12 cycles each of 3 orientations.<br>Note: Use 8"X5" PCB. 031" thick 7" secure points on one long side and secure points at corners of opposite sides which parts mounted within 2 from any secure point. Test from 10-2000 Hz. Measurement at 24±2 hours after test conclusion. | ±0.5% |
| **Resistance to Soldering Heat** | MIL-STD-202<br>260°C±5°C, 10s±1s. Measurement at 24±2 hours after test conclusion. | ±0.5% |
| **Short Time Overload** | MIL-STD-202<br>5 × Rated power for 5s. Measurement at 24±2 hours after test conclusion. | ±0.5% |
| **Thermal Shock** | MIL-STD-202<br>-55°C/+125°C, 300 Cycles, Maximum transfer time 20s Dwell. | ±1% |

# Derating Curve

## Derating Curve - FLU

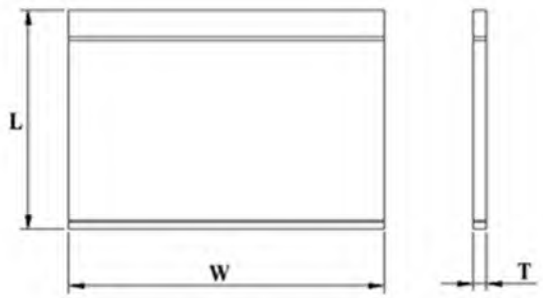



**Rated power VS Ambient temperature (Derating Cruve)**

# Packaging

## FLU - Internal Package

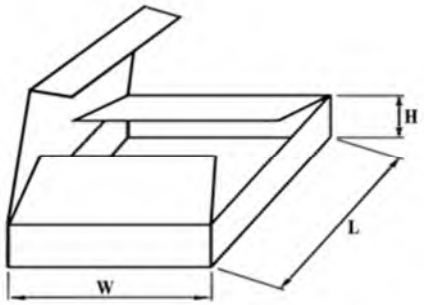
| Type | L/mm | W/mm | T/mm |
|---|---|---|---|
| **P1** | 130 | 130 | 0.2 |
| **P2** | 160 | 160 | 0.2 |
| **P3** | 210 | 150 | 0.1 |




**Internal Package (FLU)**

## FLU - External Package

| Type | L/mm | W/mm | H/mm |
|---|---|---|---|
| **B1** | 170 | 120 | 50 |
| **B2** | 240 | 180 | 115 |
| **B3** | 230 | 170 | 200 |
| **B4** | 250 | 250 | 250 |
| **B5** | 300 | 300 | 300 |




**External Package (FLU)**

# Order Codes

## Alloy Current Sensing Resistors (FLU) Order Code

| FLU | 5 | 0m10 | F |
|---|---|---|---|

| Part Number | Pitch (W) | | Resistance (Ω) | | Tolerance (%) | |
|---|---|---|---|---|---|---|
| FLU | 5 | 5mm | 0m10 | 0.00010Ω | J | ±5 |
| | 15 | 15mm | 0m50 | 0.00050Ω | G | ±2 |
| | 30 | 30mm | R005 | 0.00500Ω | F | ±1 |
| | | | R010 | 0.01000Ω | | |

- **Note: Plating, tin dipping, or size, please can be required.**

# General Information

### Your Current Options - Token Current Sense

As the world becomes more and more technology-driven, the uses for current sensing components will continue to increase. The need for even lower resistance value ranges is already becoming evident, as is the need for these resistors to handle more power. The industry-wide trend is the emergence of smaller and smaller products.

Token Electronics offers a wide variety of current sensing products from the industry to military standards, such as current sense in Thin-Film / Thick-Film Technology, Bare Element Resistors, and Open Air Shunts. This enables Token to present an astounding number of possible solutions for any circuit design needs.

### Applications of Current Detecting Components

Token's TCS and CS Series unique form factor provides automotive designers with several advantages. Both TCS and CS Series are ideal for applications involving window lift motors, fuel pump systems, seat belt pretensioners, and pulse width modulator feedback.

The wider resistive element and lower resistance enables higher current to pass through the device. Token's LRC ultra low Ohmic metal strip chip series provides the inherent ability to flex slightly and offers stress relief during extreme temperature cycling on typical or metal substrates. This LRC series is suitable for switch power supply applications (DC-DC Converter, Charger, and Adaptor) and power management of monitor.

The open air design of bare element resistor LRA and LRB Series provide a far cooler operation by allowing more air flow under the resistive element to keep excess heat from being transmitted to the PC board. They are suitable for high power AC/DC detection of power supply circuit.

Token axial moulded BWL series provides power rating up to 10 watts and lower resistance 0.005Ω, is ideal for all types of current sensing applications including switching and linear power supplies, instruments and power amplifiers.

Token standard current sensing components can be replacement for Vishay, IRC, Ohmite, KOA, Yageo devices with fast delivery and more competitive price. Contact us with your specific needs.