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(FLP) Large Current Sense Resistor Power Shunts

Token Electronics Industry Co., Ltd.

Taiwan: No.137, Sec. 1, Zhongxing Rd., Wugu District,
New Taipei City, Taiwan, R.O.C. 24872
Tel: +886 2981 0109 **Fax:** +886 2988 7487

China: 12F, Zhong Xing Industry Bld., Chuang Ye Road,
Nan Shan District, Shen Zhen City,
Guang Dong, China 518054
Tel: +86 755 26055363; **Fax:** +86 755 26055365

[Web: www.token.com.tw](http://www.token.com.tw)

[Email: rfq@token.com.tw](mailto:rfq@token.com.tw)



▶ Product Introduction

Token's Metal Plate Shunt Resistor (FLP) serves high-current precision measurement applications.

Features :

- Inductance less than 10 nH, Lead-free and RoHS compliant.
- Tolerance $\pm 1\%$, $\pm 2\%$, $\pm 5\%$. Resistance values down to 0.00005Ω .
- Overcurrent capacity 100A ~ 600A, Rated Power 3W ~ 70W.
- TCR down to $\pm 50\text{ppm}/^\circ\text{C}$ and $\pm 100\text{ppm}/^\circ\text{C}$.

Applications :

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

Token Electronics provides a wide range of precise shunts designed for high current applications requiring high precision, such as instruments, power supplies, watt-hour meters, automotive control systems, etc.

As one of current sensing resistors, metal plate alloy shunt resistors are precise low resistance which are often used in AC or DC voltage measurement. They are also called ammeter shunts.

The FLP shunt is composed of precise manganese kamar alloy plate, which is easy to weld and ensures the electrical performance of the welding joint. Strong structure provides high reliability, low inductance, and high load capacity. It is widely used in current limiting circuits such as communication systems, electronic machines, automatic control power supply, and current sharing or sampling detection.

Metal Plate FLP shunts can withstand higher current load than traditional resistors and surface mount resistors. Its power can reach 3W~70W, temperature coefficient $\pm 50\text{ppm}/^\circ\text{C}$, $\pm 100\text{ppm}/^\circ\text{C}$, inductance is less than 10 nH, resistance is as low as 0.00005Ω , tolerance accuracy $\pm 1\%$, $\pm 2\%$, and $\pm 5\%$, and overcurrent capacity can reach 100A~600A.

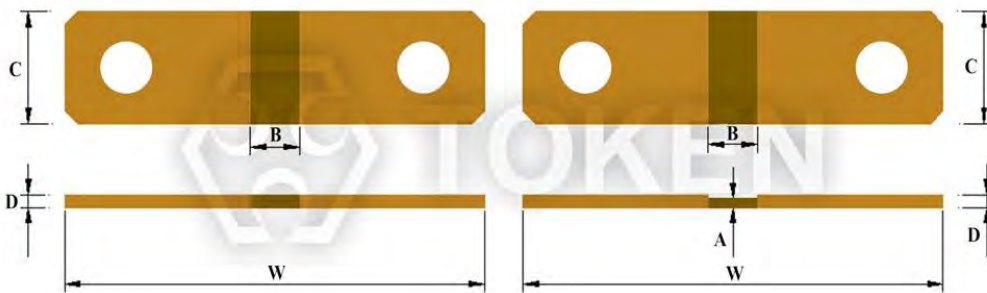
Token provides bulk FLP series, which meets the lead-free and RoHS compliant. It can be customized according to customer's needs and provide customers with lower resistance series current sensing shunt resistors. Special resistance, size, specifications, and latest product information, please contact our Business Department. Or link to Token official website "[Current Sense Resistors](http://www.token.com.tw)". Contact us with your specific needs.



► Dimensions

Power Shunts (FLP) Dimensions (Unit: mm)

Type	* Over current / A	W (mm)	B (mm)	C (mm)	D (mm)	A (mm)
FLP-M-0m05	600	85±0.5	4.5±0.2	18±0.5	3±0.1	2.15±0.1
FLP-M-0m10	600	84±0.5	10±0.2	20±0.5	3±0.1	2.3±0.1
FLP-M-0m10	400	35±0.5	5±0.2	15±0.5	1.5±0.1	-
FLP-M-0m20	600	50±0.5	10±0.2	10±0.5	3±0.1	2.3±0.1
FLP-M-0m50	150	35±0.5	8±0.2	15±0.5	0.47±0.1	-
FLP-M-R001	100	35±0.5	12±0.2	15±0.5	0.35±0.1	-
FLP-K-R002	150	35±0.5	14±0.2	15±0.5	0.62±0.1	-
FLP-K-R004	100	35±0.5	14±0.2	15±0.5	0.31±0.1	-



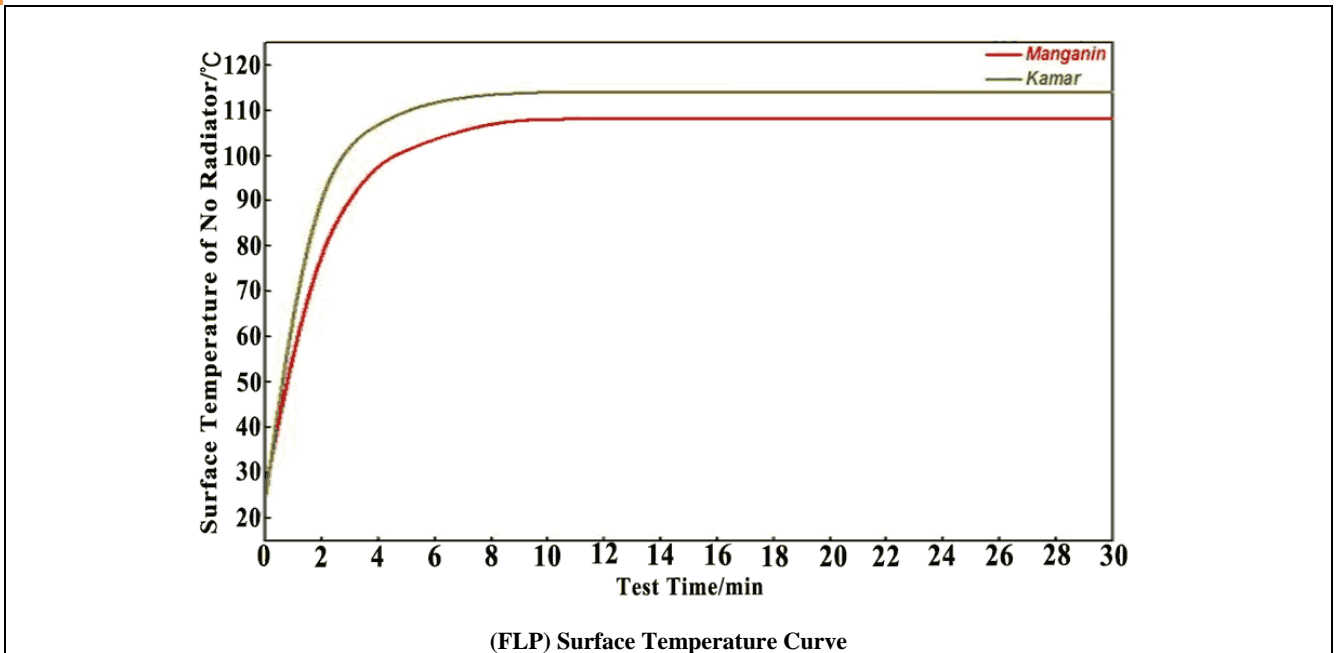
FLP - Power Shunts Dimensions

* Remark:

- Overcurrent is the current exceeds the rated current.
- Circuit currents larger than the rated load current of the circuit conductor are all overcurrent including overload current and short circuit current.
- The difference is that the overcurrent before the circuit insulation damage is called overload current, and the overcurrent after the insulation damage is called short-circuit current.

Technical Specifications

FLP - Surface Temperature Curve



FLP - TCR Derating Curve



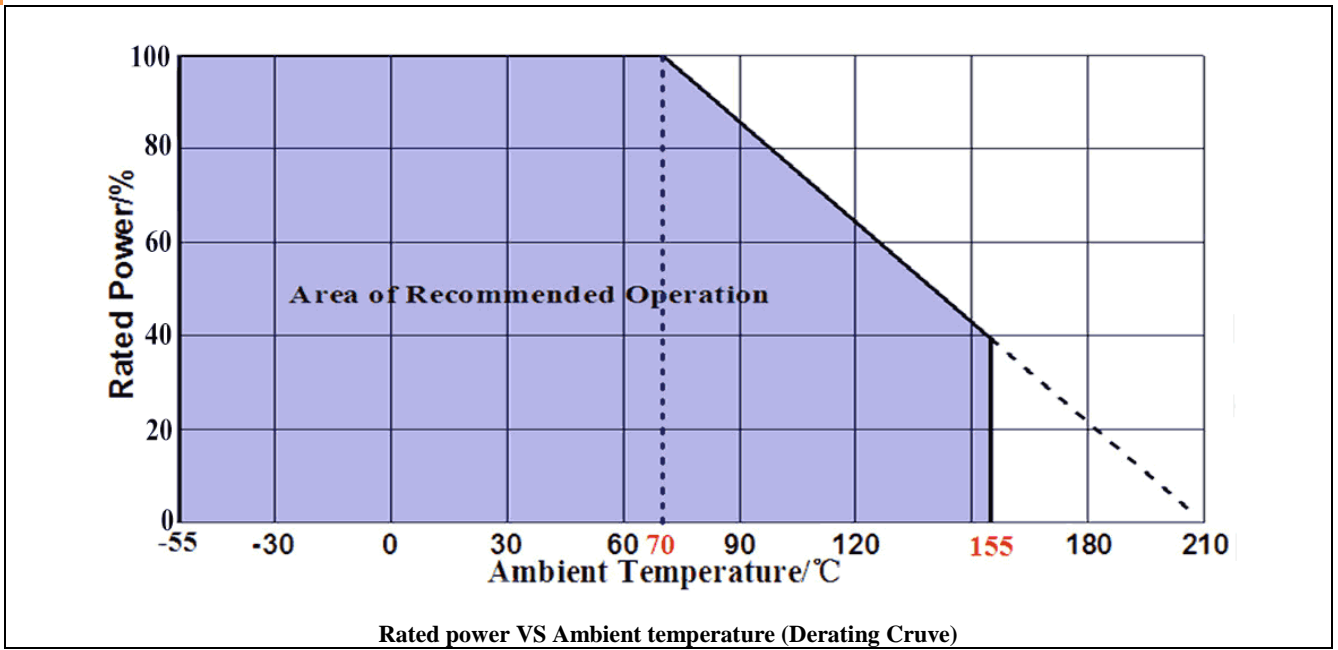
► Environmental Characteristics

Shunt Resistors (FLP) Environmental Characteristics

Items	Requirement	Test Methods
Temperature Cycling	±0.5%	JESD22 1000 Cycles (-55°C to +125°C). Measurement at 24±2 hours after test.
High Temperature Exposure	±0.5%	MIL-STD-202 1000hrs.@T=125°C. Unpowered. Measurement at 24±2 hours after test.
Moisture Resistance	±0.5%	MIL-STD-202 t=24hrs/cycle. Note:Steps 7a & 7b not required.Unpowered. Measurement at 24±2 hours after test.
Biased Humidity	±0.5%	MIL-STD-202 1000hrs 85°C/85% RH. Note: Specified conditions: 10% of operating power. Measurement at 24±2 hours after test.
Operational Life	±0.5%	MIL-STD-202 Condition D Steady State TA=125°C at rated power. Measurement at 24±2 hours after test.
Solderability	95% Coverage Minimum.	J-STD-002C 245°C±5°C, 5s+0.5s/-0.
Resistance to Soldering Heat	±0.5%	MIL-STD-202 260°C±5°C, 10s±1s. Measurement at 24±2 hours after test.
Short Time Overload	±0.5%	MIL-STD-202 5 × Rated power for 5s. Measurement at 24±2 hours after test.
Thermal Shock	±1%	MIL-STD-202 -55°C/+125°C, 300 Cycles. Maximum transfer time 20s, Dwell time 15min.
Vibration	±0.5%	MIL-STD-202 5g's for 20 min, 12 cycles each of 3 orientations. 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.

▶ Derating Curve

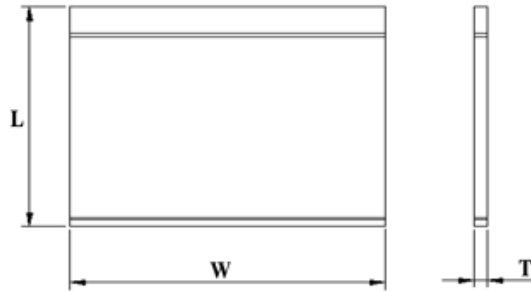
Shunt Resistors (FLP) Derating Curve



► Packaging

Large Current Shunts (FLP) Internal Package

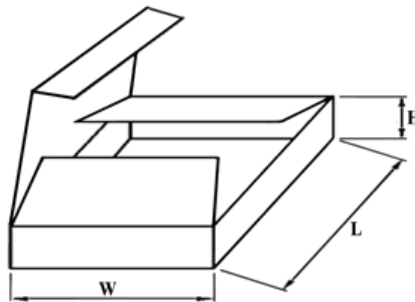
Type	L/mm	W/mm	T/mm
P1	130	130	0.2
P2	160	160	0.2
P3	210	150	0.1



FLP - Internal Package

Large Current Shunts (FLP) 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



FLP - External Package

Order Codes

Metal Plate Large Current Sense Power Shunts (FLP) - Order Code

FLP	600		M		0m20		F	
Part Number	Over Current (A)		Material		Resistance (Ω)		Tolerance (%)	
FLP	100	100 A	M	Manganin	0m05	0.00005 Ω	J	± 5
	150	150 A	K	Kamar	0m20	0.0002 Ω	G	± 2
	400	400 A			0m50	0.0005 Ω	F	± 1
	600	600 A			R001	0.001 Ω		
					R004	0.004 Ω		

- 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.

