

Version:  
February 28, 2017

# DIRECT

## Electronics Tech.

### (LPS)

# 4 Kelvin Current Sense Resistor

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

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

**Direct Electronics Industry Co., Ltd.**

**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

**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

## ▶ Product Introduction

Direct's low value 4 lead kelvin current sensing (LPS) resistors family offers a variety of possibilities for current shunts.

### Features :

- Radial leads.
- Non-inductance.
- Solderable Copper Leads.
- Lead (Pb)-free and RoHS compliant.
- $\pm 2\%$ ,  $\pm 5\%$ ,  $\pm 10\%$  standard tolerance.
- High stability bare metal element open air resistor.

### Applications :

- Automotive, Feedback System.
- Residual Battery Power Detection.
- CPU Drive Control, Power Tool Motor controls.
- Power Supply Shunt, Current Detective, and Current Sensing.
- Inverter and Switching Power Supplies
- High power AC/DC detection.

The (LPS) family for shunt is expected to gain wide acceptance in the worldwide market as a result of offering a variety of possibilities.

The U-shaped semi-customized LPS family for direct board mounting is specified for precision current sensing, feedback, current detective, supper low inductance, as well as surge and pulse applications. LPS family Available in very low ohm ( $0.002\Omega \sim 0.05\Omega$ ) and high power ( $1W \sim 5W$ ).

The dimension of the semi-customized final unit is designed in accordance with the application requirements of resistance value and required power rating. Direct's LPS series can be manufactured with 2 or 4 solder tags (terminals). The LPS type B with 2 solder tags (1 pin on each side) is a standard part of LPS series and type A with 4 terminals (2 pin on each side) is used either for Kelvin connections or for high current applications. Depending from the alloy material's thickness, one terminal contact on each side can carry up to 50A ( $A \text{ (Current)} = (W \text{ (Power)} / \Omega \text{ (Resistance)})^{1/2}$ ), so a 4-terminal part can carry 100A (ask Direct factory).

Operating temperature range is  $-50^{\circ}\text{C}$  to  $300^{\circ}\text{C}$  with tolerances  $\pm 2\%$ ,  $\pm 5\%$ , and  $\pm 10\%$ .

Direct will also produce low value current sense resistor LPS series outside these specifications to meet customer requirements. Contact us with your specific needs, or link to Direct official website "[Current Sensing Resistors](#)" for more information.

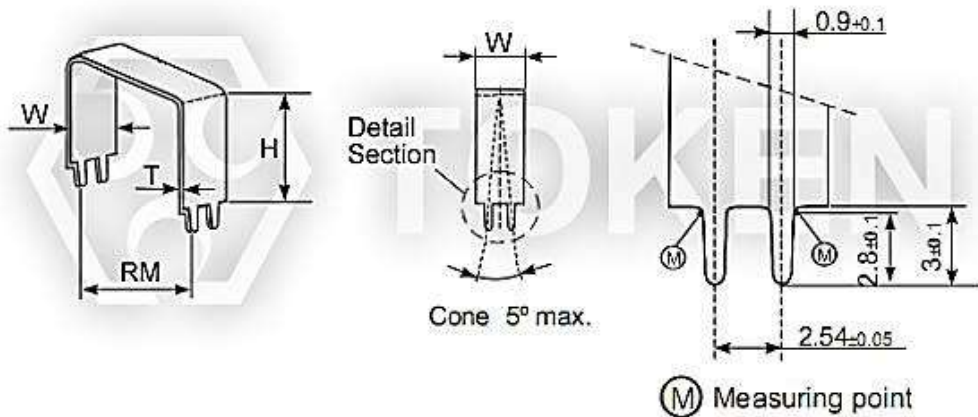


**Dimensions**

**Dimensions (Unit: mm) Open Air 4-T & 2-T (LPS)**

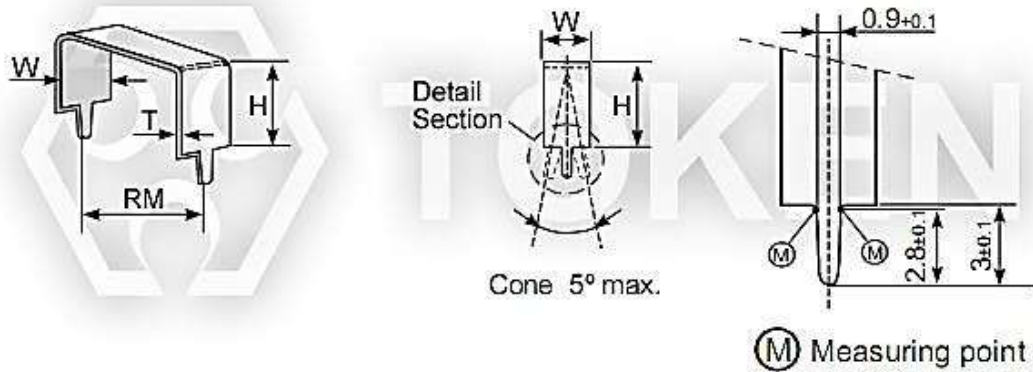
Type	Power (Watts)	Resistance Range ( $\Omega$ )	RM (mm)	H (mm) Max.
LPS359-008	1	R005~R05	5 ~ 30	20.0
LPS359-009	2	R005~R02		
LPS359-010	3	R003~R01		
LPS359-011	5	R002~R005		

**Type A - 4 Terminals**



**Semi-customized (LPS) Dimensions Type A - Four Terminal for Kelvin Connection**

**Type B - Two Terminals**



**Semi-customized (LPS) Dimensions Type B - Open Air Low Value Two Terminal Resistor**

**Construction:**

- 1. W, T and H depend on material, resistance value and required power rating.
- 2. RM: 5~30 mm, preferably in 5 mm-steps. Special varieties on request.
- 3. M: Measuring point.



## Characteristics

### Characteristic Specification (LPS)

Test Items	Specification
Resistance range	R002~R05
Tolerances	±2%, ±5%, ±10%
Temperature coefficient	Upon request
Insulation voltage	Non insulated
Insulation resistance	Non insulated
Derating, linear	70~300°C (0W)
Climatic category	55/155/21
Temperature range	-50~300°C
Endurance (P70, 70°C, 1000 Hrs.)	$\Delta R \leq \pm 2\%R$
Damp heat, steady state (40°C, 93% r.h., 56d)	$\Delta R \leq \pm 2\%R$
Climatic sequence	$\Delta R \leq \pm 0.5\%R$
Terminal strength	None
Terminal tensile strength	None
Resistance to soldering heat (350°C, 3.5s)	$\Delta R \leq \pm 0.5\%R$ typ.
Solderability (Solder bath method 235±5°C, 2±0.5s)	Good tinning (≥ 90 % covered), no visible damage

## Order Codes

### Order Codes (LPS)

LPS359-008	B	3	R024	J	P		
Part Number	Terminal Type	Rated Power		Resistance Value (Ω)		Tolerance (%)	Pack. -Code
LPS359-008	A 4 Terminals	1	1 W	R002	0.002	G ±2	P Bulk
LPS359-009	B 2 Terminals	2	2 W	R010	0.010	J ±5	
LPS359-010		3	3 W	R022	0.022	K ±10	
LPS359-011		5	5 W	R050	0.050		



## ► General Information

### **Your Current Options - Direct 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.

Direct 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 Direct to present an astounding number of possible solutions for any circuit design needs.

### **Applications of Current Detecting Components**

Direct'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. Direct'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.

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

Direct 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.

