

## Closed Loop Hall AC/DC Current Sensor CYHCS-LSP

This Hall Effect current sensor is based on closed loop principle and designed with a high galvanic isolation between primary conductor and secondary circuit. It can be used for measurement of DC and AC current, pulse currents etc. The output of the transducer reflects the real wave of the current carrying conductor.

Product Characteristics	Applications
<ul style="list-style-type: none"> <li>• Excellent accuracy</li> <li>• Very good linearity</li> <li>• Small size and encapsulated</li> <li>• Less power consumption</li> <li>• Current overload capability</li> </ul>	<ul style="list-style-type: none"> <li>• Photovoltaic equipment</li> <li>• General Purpose Inverters</li> <li>• AC/DC Variable Speed Drivers</li> <li>• Battery Supplied Applications</li> <li>• Uninterruptible Power Supplies (UPS)</li> <li>• Switched Mode Power Supplies</li> </ul>

### ELECTRICAL CHARACTERISTIC

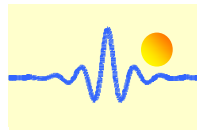
Part number	CYHCS-LSP6A	CYHCS-LSP15A	CYHCS-LSP20A	CYHCS-LSP25A	CYHCS-LSP50A	CYHCS-LSP80A
Nominal current (I <sub>pn</sub> )	6A	15A	20A	25A	50A	80A
Measuring range (I <sub>p</sub> )	±6.6A	±16.5A	±22A	±27.5A	±55A	±88A
Secondary Turns (N <sub>s</sub> )	1200±1	1500±1	1000±1	1250±1	1000±1	1200±1
Secondary resistor	40Ω	45Ω	25Ω	25Ω	20Ω	36Ω
sampling resistor	100Ω±0.1%	50Ω±0.1%	25Ω±0.1%	25Ω±0.1%	10Ω±0.1%	7.5Ω±0.1%
Nominal output voltage	(±2.5VDC±0.4%) ± (2V ± 0.5%), at I <sub>p</sub> =I <sub>pn</sub>					
Supply voltage	+5VDC ±5%					
Galvanic isolation	50Hz, 1min, 2.5kV					
Impulse withstand voltage	1.2/50μs, >8kV					
Creepage distance	>15.4mm					
Load capacity	≤ 10nF @ V <sub>out</sub> and GND					
Load resistance	10 kΩ					

### ACCURACY DYNAMIC PERFORMANCE

Zero offset voltage T <sub>a</sub> =25°C	2.5 ±0.4%	V
Thermal drift of offset voltage I <sub>p</sub> =0, T <sub>a</sub> =-40°C ~ +105°C	≤ ±0.1	mV/°C
Thermal drift of output voltage I <sub>p</sub> =0, T <sub>a</sub> =-40°C ~ +105°C	≤ ±0.1	mV/°C
Total measuring accuracy	≤±0.7	% FS
Linearity	≤±0.1	%FS
Following accuracy di/dt	>50	A/μs
Response time	<1.0	μS
Bandwidth (-3dB)	DC ~ 100	kHz
Current consumption	15 +I <sub>p</sub> /N <sub>s</sub>	mA

### GENERAL CHARACTERISTIC

Operating temperature	-40 ~ +105	°C
Storage temperature	-40 ~ +125	°C
Unit weight	10	g
Reference Standard	UL94-V0, EN60947-1:2004, IEC60950-1:2001, SJ 20790-2000	

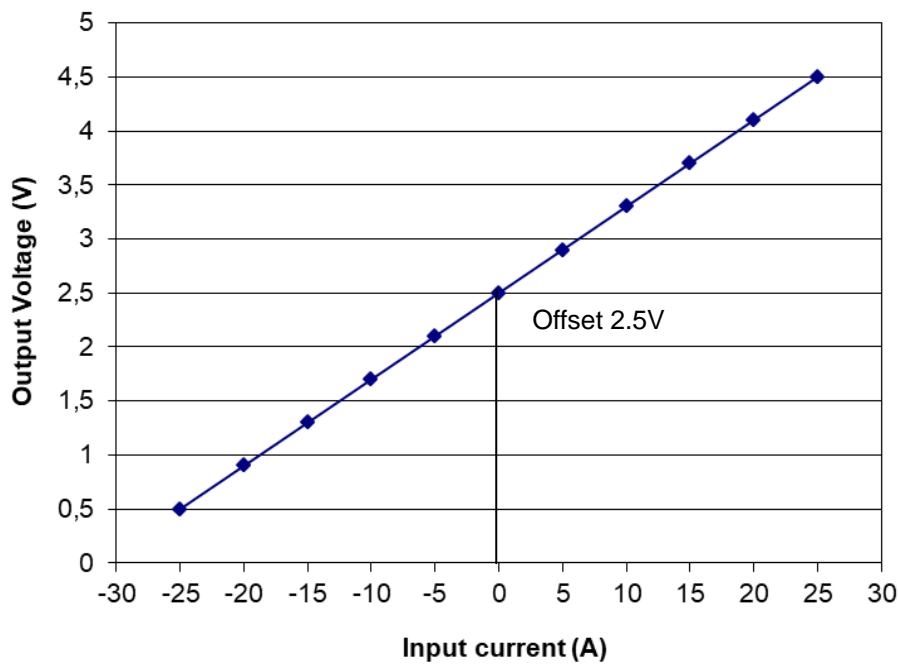


## Relation between Input Current and Output Voltage

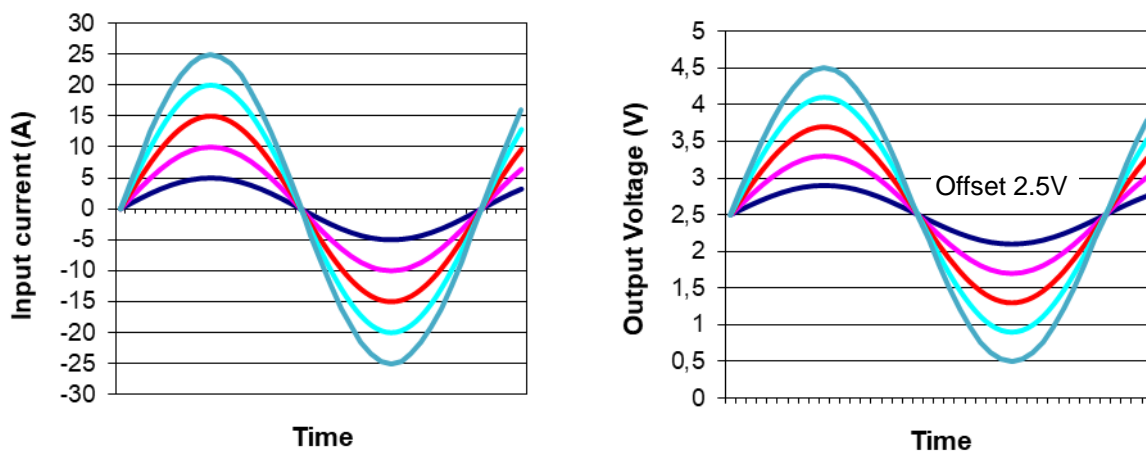
Take the sensor CYHCS-LSP-25A as sample, the relation between the input current and output voltage is shown in the table 1, Fig.1 and Fig. 2

**Table 1.** Relation between the input current and output voltage

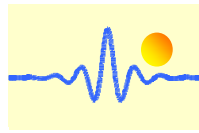
Input current (A)	-25	-20	-15	-10	-5	0	5	10	15	20	25
Output voltage (V)	0.5	0.9	1.3	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.5



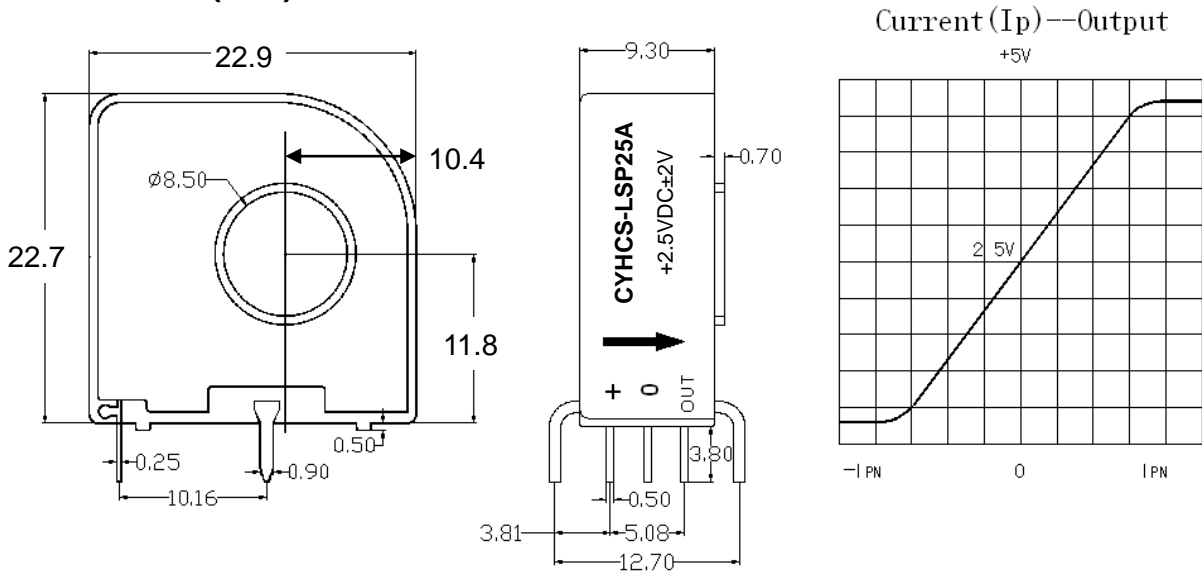
**Fig. 1** Relation between the input current (DC) and output voltage (DC)



**Fig. 2** Relations between the input current (AC) and output voltage (AC)

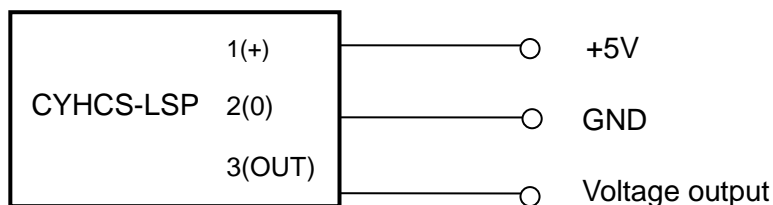


## Dimensions (mm)



**Fig. 3** Dimensions of CYHCS-LSP

## Connection



**Fig. 4** Connection of CYHCS-LSP

## Sizes and tolerances:

- Geometric tolerance:  $\pm 0.2\text{mm}$
- Sizes of 3 pins:  $0.25 \times 0.5\text{mm}$
- Size of mounting pins:  $0.8 \times 0.9\text{mm}$
- Hole diameter:  $\Phi 8.5\text{mm}$

## Pin arrangement

- +: +5VDC
- 0: GND
- OUT: Output

## Notes:

1. Connect the terminals of power source, output respectively and correctly, never make wrong connection for DC current.
2. Temperature of the primary conductor should not exceed  $100\text{ }^{\circ}\text{C}$ .
3. Dynamic performances ( $di/dt$  and the response time) are best with a single bar completely filling the primary hole.
4. In order to achieve the best magnetic coupling, the primary windings have to be wound over the top edge of the device.