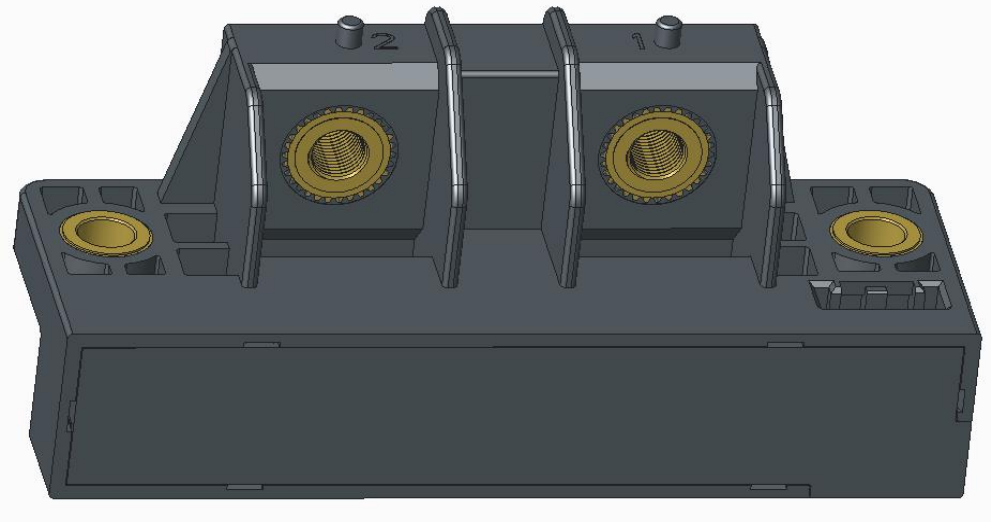
Current Sensor

Product Series: SHK-VBS-T

Part number: SHK-VBS-T5-300-S2

Version: Ver 1.3



Sinomags Technology Co., Ltd

Web site: www.sinomags.com

CONTENT

1. Description

The SHK-VBS-T5-300-S2 current sensor is based on Hall and open-loop design. It is suitable for DC, AC pulsed and any kind of irregular current measurement under the isolated conditions.

Typical applications

- AC Variable speed drives
- Inverter
- Electric welder power supply
- Switched model power supplies (SMPS)

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_a	℃	-40 ~ 125
Storage temperature	T_{stg}	℃	-40 ~ 125
Mass	m	g	100

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	V	-0.5 ~ 8 (Not operating)
			-0.5 ~ 6.5
Electrostatic discharge voltage	$U_{ESD\ HBM}$	kV	8(HMB)

Remark: the unrecoverable damage may occur when the product works on the conditions over the absolute maximum ratings. Long-time working on the absolute maximum ratings may cause the degradation on performance and reliability.

Isolation parameter

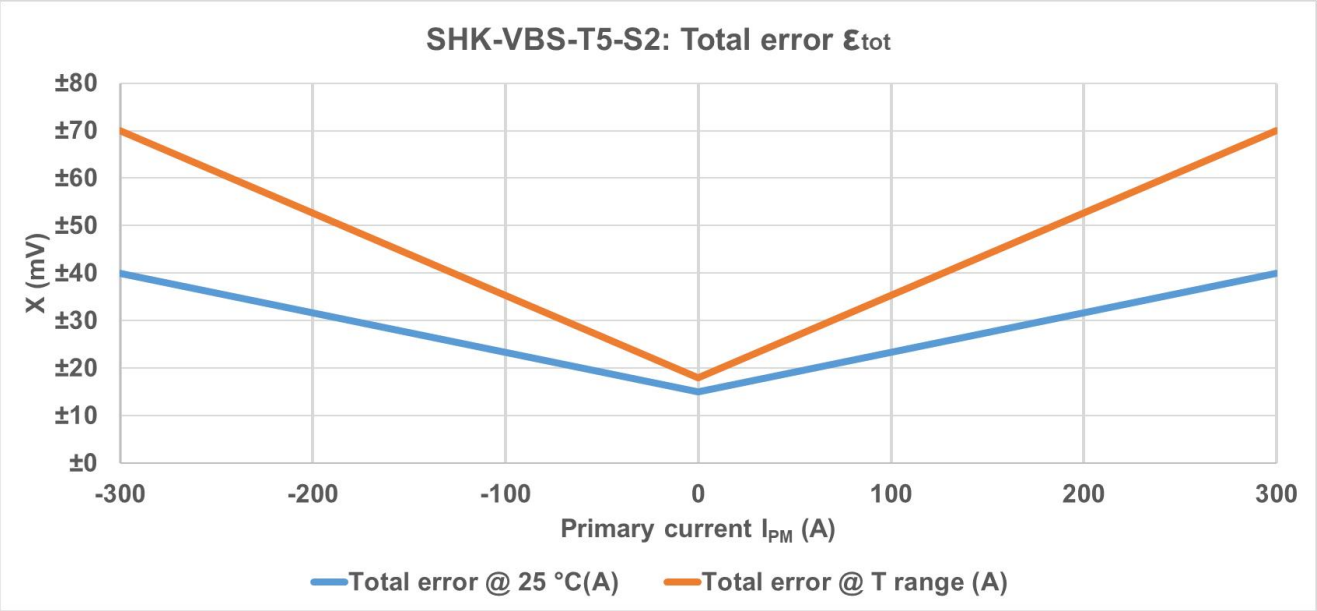
Parameter	Symbol	Unit	Value	Comment
Insulation voltage	U_d	kV	2.5	RMS voltage for AC test 50Hz-1 min
Insulation resistance	R_{INS}	MΩ	500	DC 1000V，ISO 16750
Clearance distance (pri. -sec)	d_{Cl}	mm	10.2	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	11.6	Shortest path along device body
Case material			V0 according to UL 94	

2. Electrical data

Condition: T_a = 25℃, V_{CC} = 5.0 V

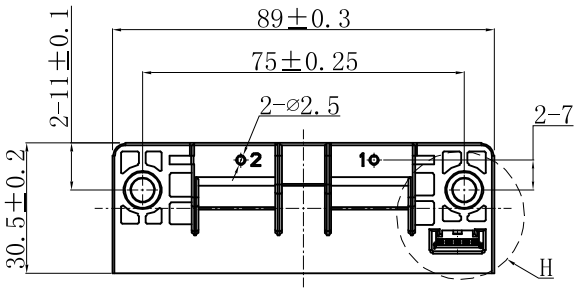
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-300		300	SHK-VBS-T5-300-S2
Supply voltage	V_{CC}	V	4.75	5	5.25	
Current consumption	I_{CC}	mA		30	40	@ V_{CC}= 5.0 V
Output voltage	V_{OUT}	V	$(V_{CC}/5)\times(V_{off}+G\times I_{PM})$			@ T_a = 25℃
Quiescent voltage	V_{off}	V		2.5		@ T_a = 25℃, V_{CC} = 5.0 V
Sensitivity	G	mV/A		6.67		@ T_a = 25℃, V_{CC} = 5.0 V
Load resistance	R_L	kΩ	10			
Ratiometricity error	ε_r	%		±0.5		
Sensitivity error	ε_G	%		±1		@ T_a = 25 °C, After T ° Cycles
Electrical offset voltage error	V_{OE}	mV		±2.0		@ T_a = 25℃, V_{CC} = 5.0 V
Magnetic offset voltage error	V_{OM}	mV		±7.0		@ T_a = 25℃, V_{CC} = 5.0 V
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/℃		±0.04		@ -40℃<T_a <125℃
Ave. Temp. coefficient of S	TCS_{AV}	%/℃		±0.02		@ -40℃<T_a <125℃
Linearity error	ε_L	% I_P		±1		of Full range, −300 A ≤ I_P ≤ 300 A @ T_a = 25℃, V_{CC} = 5.0 V
Response time	T_r	μs		2	4	@ 90% of I_{PM}
Frequency bandwidth (-3 dB)	BW	kHz	40			No RC circuit
Output voltage noise	V_{no}	mVpp			20	@ DC ~ 10 kHz

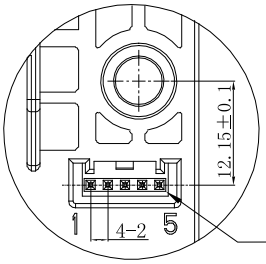
Total error(mV) for ⩽300A



Overall accuracy X specification						
I_{PM}(A)	@Ta=25℃， VCC=5.0V			@-40℃⩽Ta⩽125℃， VCC=5.0V		
-300	±40mV	±6A	±2%	±70mV	±10.5A	±3.5%
0	±15mV	±2.25A	±0.75%	±18mV	±2.7A	±0.9%
300	±40mV	±6A	±2%	±70mV	±10.5A	±3.5%

3. Dimension & Pin definitions





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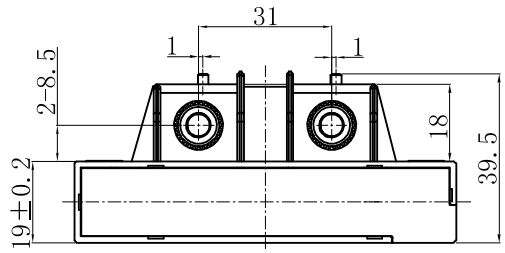
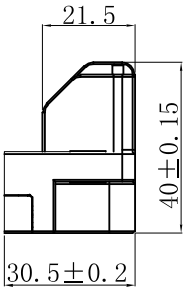
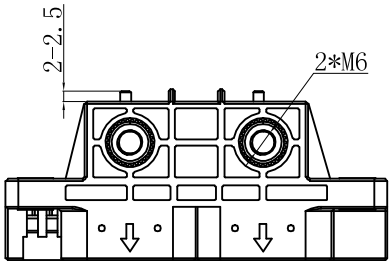
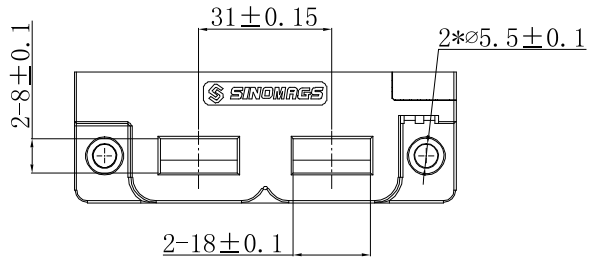
Sensor match with HRS connector GT8E-5S-HU.







Current Direction



Terminals:

Pin 1	Vdd
Pin 2	GND
Pin 3	Vout-1
Pin 4	Vout-2
Pin 5	NC

Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm