

Current Sensor

Product Series: SHK-VBS-T

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

Version: Ver 1.0



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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
- Electric welder power supply
- Inverter
- Switched model power supplies (SMPS)

General parameter

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

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	V_{cc}	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

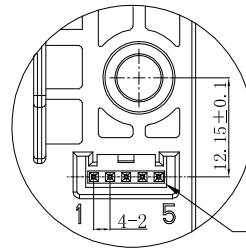
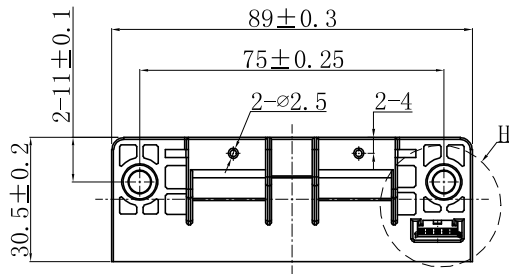
Parameter	Symbol	Unit	Value	Comment
Insulation voltage	U_d	kV	2.5	RMS voltage for AC test 50Hz-1 min
Insulation resistance	R_{INS}	MΩ	500	DC 1000V, ISO 16750
Clearance distance (pri. -sec)	d_{Cl}	mm	10.2	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	11.6	Shortest path along device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

2. Electrical data

 Condition : $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$

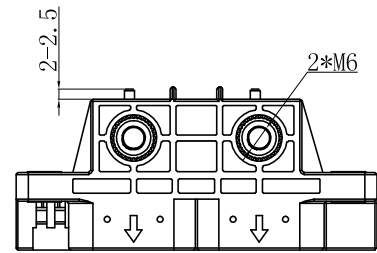
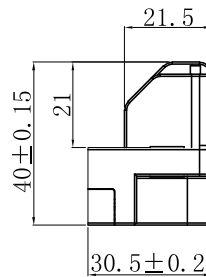
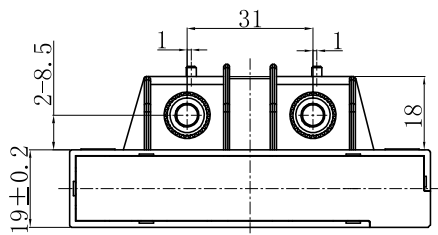
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-300		300	SHK-VBS-T5-300-S2
Supply voltage	V_{CC}	V	4.75	5	5.25	
Current consumption	I_{CC}	mA		30	40	@ $V_{CC} = 5.0\text{ V}$
Output voltage	V_{OUT}	V	$(V_{CC}/5) \times (V_{off} + G \times I_{PM})$			@ $T_a = 25^{\circ}\text{C}$
Quiescent voltage	V_{off}	V		2.5		@ $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$
Sensitivity	G	mV/A		6.67		@ $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$
Load resistance	R_L	k Ω	10			
Ratiometricity error	ϵ_r	%		± 0.5		
Sensitivity error	ϵ_G	%		± 1		@ $T_a = 25^{\circ}\text{C}$, After T ° Cycles
Electrical offset voltage error	V_{OE}	mV		± 2.0		@ $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$
Magnetic offset voltage error	V_{OM}	mV		± 7.0		@ $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/ $^{\circ}\text{C}$		± 0.04		@ $-40^{\circ}\text{C} < T_a < 125^{\circ}\text{C}$
Ave. Temp. coefficient of S	TCS_{AV}	%/ $^{\circ}\text{C}$		± 0.02		@ $-40^{\circ}\text{C} < T_a < 125^{\circ}\text{C}$
Linearity error	ϵ_L	% I_P		± 1		of Full range, $-300\text{ A} \leq I_P \leq 300\text{ A}$ @ $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V}$
Response time	T_r	μs		2	6	@ 90% of I_{PM}
Frequency bandwidth (-3 dB)	BW	kHz	40			No RC circuit
Output voltage noise	V_{no}	mVpp			20	@ DC ~ 10 kHz

3. Dimension & Pin definitions

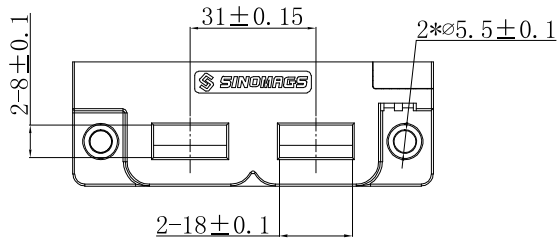


Sensor match with HRS connector GT8E-5S-HU.

Detail-H 2:1



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

