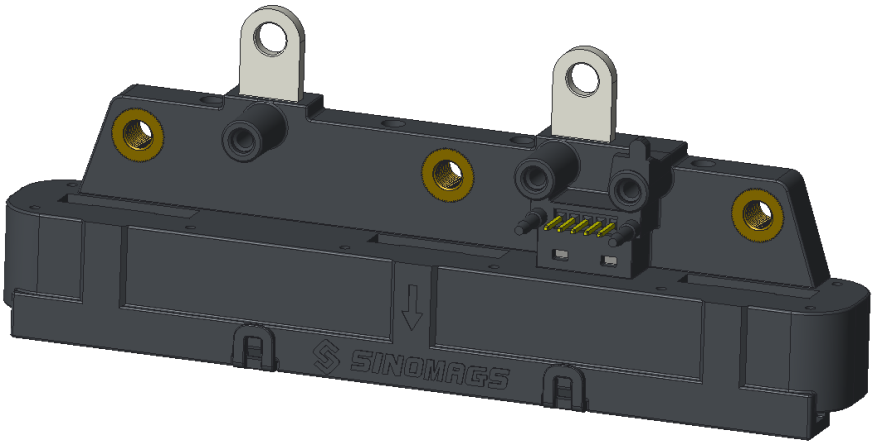
SINOMAGS 希 磁 科 技

Current Sensor

Product Series: SHK-VBS-T

Part number:
SHK-VBS-T6-800-S5
SHK-VBS-T6-900-S5
SHK-VBS-T6-1000-S5
SHK-VBS-T6-1100-S5
SHK-VBS-T6-1200-S5

Version: Ver 1.1



Sinomags Technology Co., Ltd

Web site: www.sinomags.com

CONTENT

1. Description

The SHK-VBS-T6 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	117

Absolute maximum rating

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

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	500 V DC, ISO 16750
Clearance distance (pri. -sec)	d_{Cl}	mm	4	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	5.1	Shortest path along device body
Comparative trraking index	CTI		PLC 3	
Case material			V0 according to UL 94	

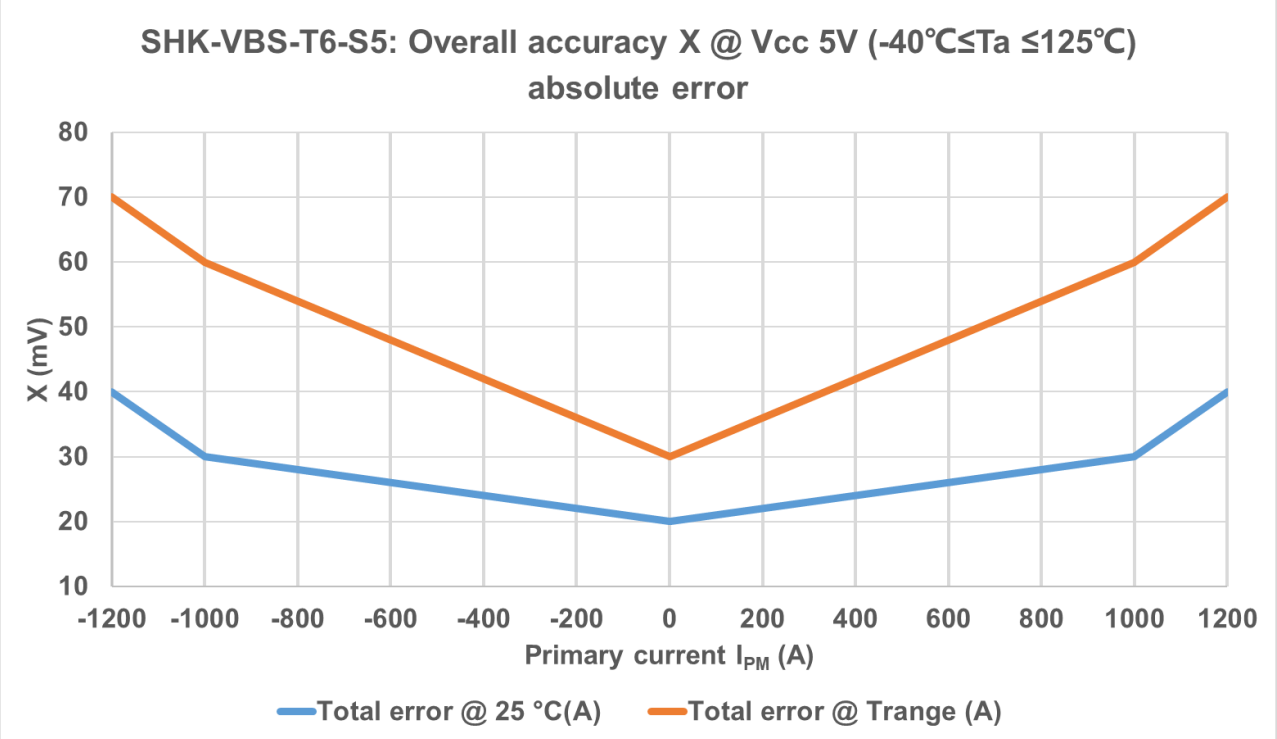
2. Electrical data

Condition：T_a = 25℃， V_{CC} = 5.0 V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-800		800	SHK-VBS-T6-800-S5
			-900		900	SHK-VBS-T6-900-S5
			-1000		1000	SHK-VBS-T6-1000-S5
			-1100		1100	SHK-VBS-T6-1100-S5
			-1200		1200	SHK-VBS-T6-1200-S5
Supply voltage	V_{CC}	V	4.75	5	5.25	All
Current consumption	I_{CC}	mA		45	60	@ V_{CC}= 5.0 V
Output voltage	V_{OUT}	V	$(V_{CC}/5)\times(V_{off}+G\times I_P)$			@ T_a = 25℃
Quiescent voltage	V_{off}	V		2.5		@ T_a = 25℃, V_{CC} = 5.0 V
Sensitivity	G	mV/A		2.50		SHK-VBS-T6-800-S5
				2.22		SHK-VBS-T6-900-S5
				2.00		SHK-VBS-T6-1000-S5
				1.82		SHK-VBS-T6-1100-S5
				1.67		SHK-VBS-T6-1200-S5
Load resistance	R_L	kΩ	10			
Ratiometricity error	ε_r	%		±0.5		@ 4.75V ≤ V_{CC} ≤ 5.25V
Sensitivity error	ε_G	%		±1		@ T_a = 25℃, V_{CC} = 5.0 V
Electrical offset voltage error	V_{OE}	mV		±2.0		@ T_a = 25℃, V_{CC} = 5.0 V
Magnetic offset voltage error	V_{OM}	mV		±2.0		@ T_a = 25℃, V_{CC} = 5.0 V, after ±I_{PM}
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		1	% of Full range, -1000 A ≤ I_P ≤ 1000 A
			-2		2	% of Full range, 1000 A < |I_P| < 1200 A

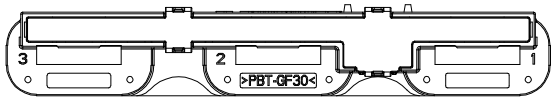
Accuracy @ 25℃	E_{TOT}	% of I_P	-1.5		1.5	@ T_a = 25℃,V_{CC} = 5.0 V -1000 A ≤ I_P ≤ 1000 A
			-2		2	@ T_a = 25℃,V_{CC} = 5.0 V 1000 A < $\|I_P\|$ < 1200 A
Accuracy @ -40℃ ~ 125℃	E_{TOT}	% of I_P	-3		3	@ -40℃≤T_a ≤125℃, V_{CC} = 5.0 V -1000 A ≤ I_P ≤ 1000 A
			-3.5		3.5	@ -40℃≤T_a ≤125℃, V_{CC} = 5.0 V 1000 A < $\|I_P\|$ < 1200 A
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

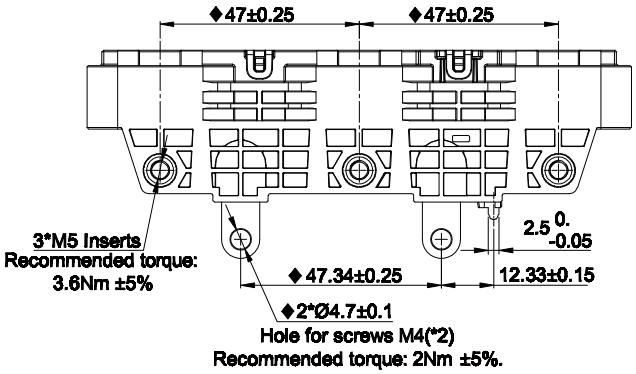
Total error(mV) for I_P

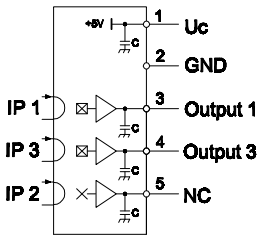


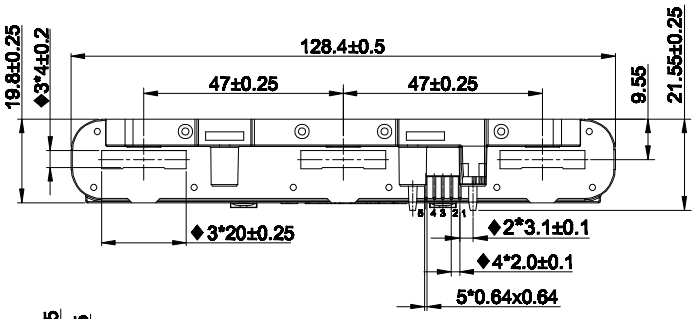
Overall accuracy X specification						
I_{PM}(A)	@Ta=25C°, VCC=5.0V			@-40C°≤Ta≤125C°, VCC=5.0V		
-1200	40mV	24A	2.00%	70mV	42A	3.50%
-1000	30mV	18A	1.50%	60mV	36A	3.00%
-800	20mV	12A	1.00%	30mV	18A	1.50%
0	20mV	12A	1.00%	30mV	18A	1.50%
800	20mV	12A	1.00%	30mV	18A	1.50%
1000	30mV	18A	1.50%	60mV	36A	3.00%
1200	40mV	24A	2.00%	70mV	42A	3.50%

3. Dimension & Pin definitions



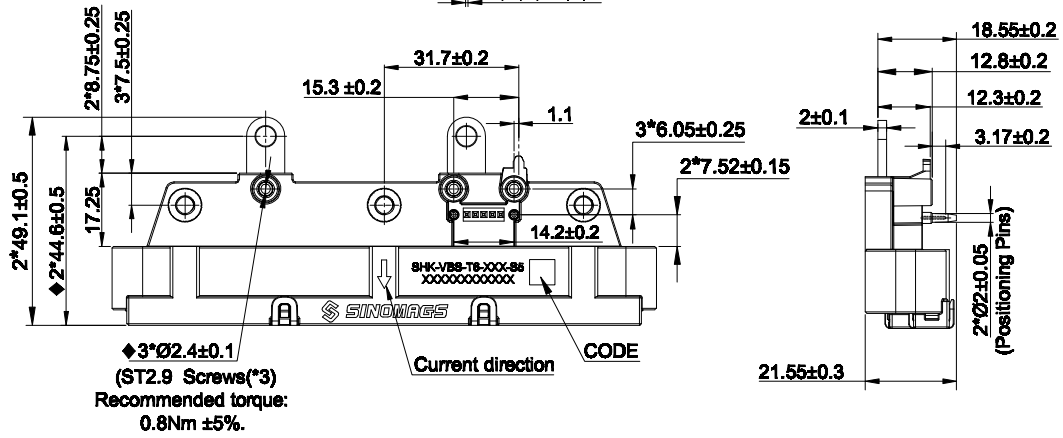


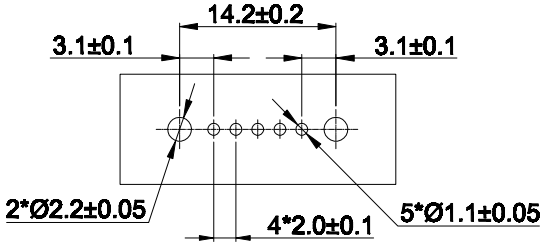




Terminals:

Pin 1	Uc
Pin 2	GND
Pin 3	Output 1
Pin 4	Output 3
Pin 5	NC





PCB DRILLING FOR SOLDERING
SCALE 2:1

NOTES
1. Materials: -Plastis parts: PBT+30%GF (BLACK);
2. Inserts / spacers: Brass;
3. General tolerance :
0-10 ± 0.1
10-30 ± 0.2
30-130 ± 0.3

4. Environmental test

Name	Test condition
Environmental tests, electrical tests	
Humidity test	85℃/85%,1000hr
Thermal shock	-40℃/125℃, 1000cycles
High temperature test	125℃, 1000hr
Low temperature test	-40℃, 1000hr
Insulation voltage	2.5kV, 50Hz, 1min
Insulation resistance	DC500V, 1min
Mechanical tests	
Shocks	ISO16750-3
Vibration test	ISO16750-3
EMC tests	
Electrostatic discharges	ISO10605(07/2008)
Bulk current injection	ISO11452-4(12/2011)
Immunity to Radiated disturbances	ISO11452-2(11/2004), ALSE
Emission radiated	CISPR25(03/2008), ALSE
Immunity power line magnetic fields	ISO11452-8(06/2015)

5. Important notice

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