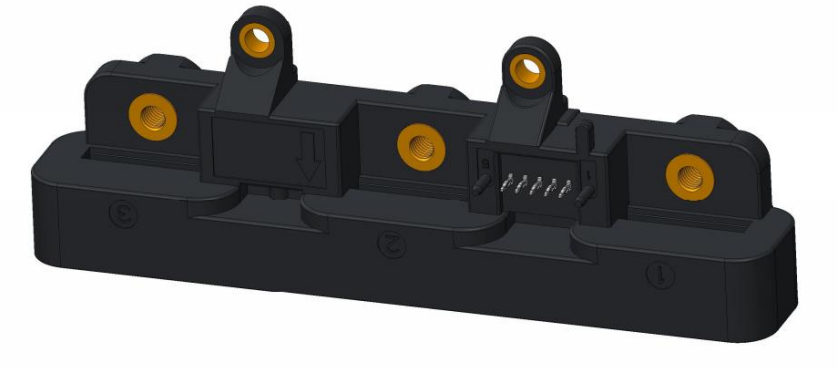
SINOMAGS 希 磁 科 技

Current Sensor

Product Series: SHK-VBS-T

Part number:
SHK-VBS-TM-600-S2
SHK-VBS-TM-800-S2
SHK-VBS-TM-900-S2
SHK-VBS-TM-1000-S2

Version: Ver 1.3



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Web site: www.sinomags.com

CONTENT

1. Description

The SHK-VBS-T 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

- Electrical Power Steering
- Motor drive application
- Converters
- Battery Management

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_a	℃	-40 ~ 125
Storage temperature	T_{stg}	℃	-40 ~ 125
Mass	m	g	105

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	V	-0.3 ~ 10 (Not operating)
			6.5
Electrostatic discharge voltage	U_{ESD}	kV	8 (HBM)

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.

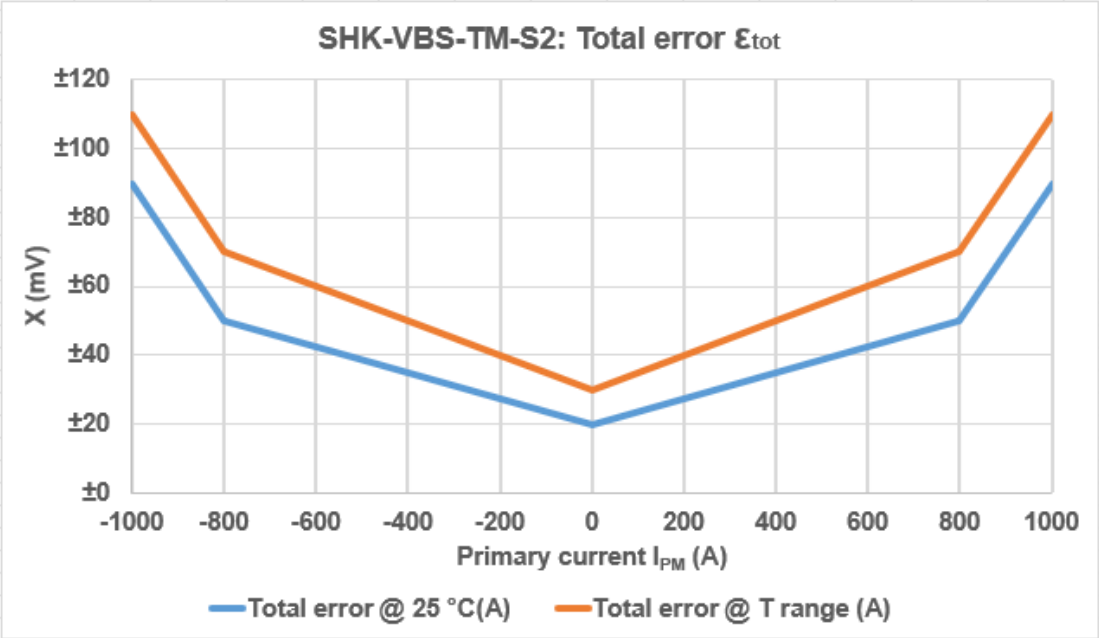
Isolation parameter

Parameter	Symbol	Unit	Value	Comment
Insulation voltage	U_d	kV	2.8	RMS voltage for AC test 50Hz/1 min
Insulation resistance	R_{is}	MΩ	500	DC 1kV/1 min
Clearance distance (pri. -sec)	d_{Cl}	mm	9	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	9	Shortest path along device body
Comparative tracking index	CTI	0	600	IEC60112
Case material			V0 according to UL 94	

2. Electrical data

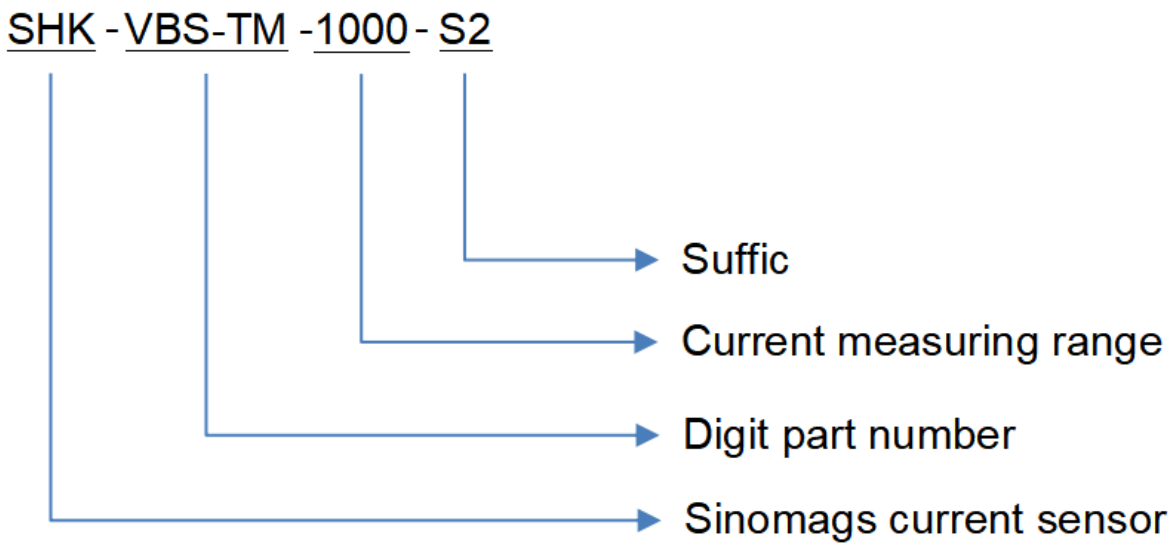
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-600		600	SHK-VBS-TM-600-S2
			-800		800	SHK-VBS-TM-800-S2
			-900		900	SHK-VBS-TM-900-S2
			-1000		1000	SHK-VBS-TM-1000-S2
Supply voltage	V_{CC}	V	4.75	5	5.25	
Current consumption	I_{CC}	mA		45	60	@ V_{CC}= 5.0 V
Output 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		3.33		SHK-VBS-TM-600-S2
				2.5		SHK-VBS-TM-800-S2
				2.22		SHK-VBS-TM-900-S2
				2.0		SHK-VBS-TM-1000-S2
Load resistance	R_L	kΩ	10		100	
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	-20	±10	20	@ T_a = 25℃, V_{CC} = 5.0 V
Magnetic offset voltage error	V_{OM}	mV		±5		@ T_a = 25℃, V_{CC} = 5.0 V, after ±I_{PM}
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/℃		±0.15		@ -40℃≤T_a ≤125℃
Ave. Temp. coefficient of G	TCG_{AV}	%/℃		±0.03		@ -40℃≤T_a ≤125℃
Linearity	ε_L	%		±1		@ T_a = 25℃, V_{CC} = 5.0 V, -800A< I_P <800A
				±3		@ T_a = 25℃, V_{CC} = 5.0 V, 800A< I_P <1000A, -1000A< I_P <-800A
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

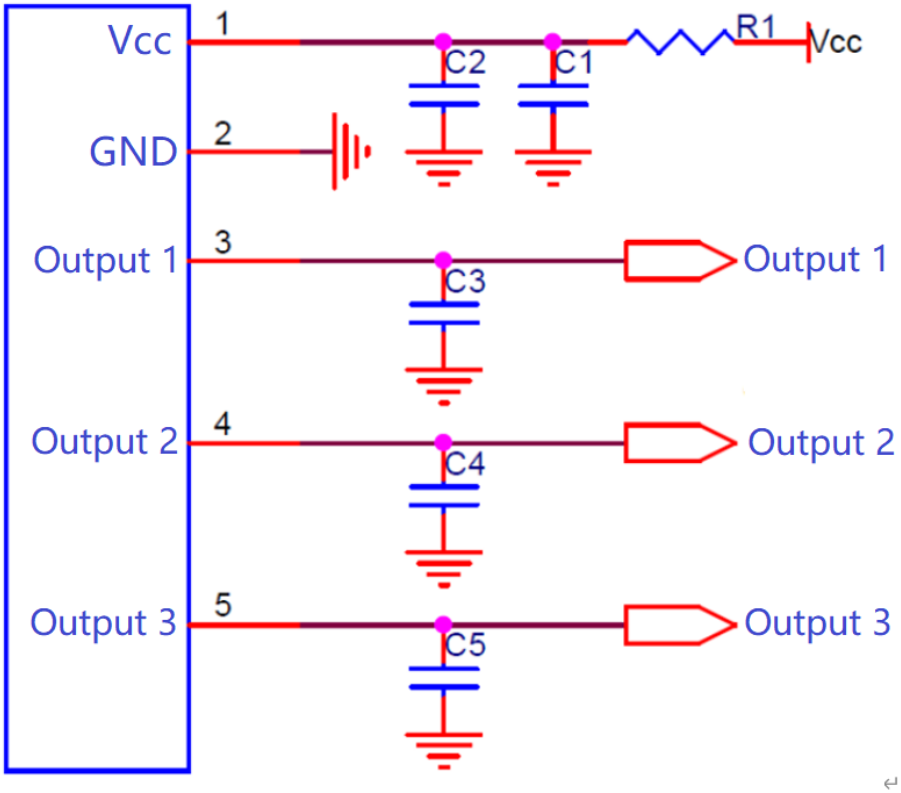


Total error εtot specification(mV)						
I_{PM}(A)	@Ta=25℃, Vcc=5.0V			@-40℃≤Ta≤125℃, Vcc=5.0V		
-1000	90mv	45A	4.50%	110mv	55A	5.50%
-800	50mv	25A	2.50%	70mv	35A	3.50%
0	20mv	10A	1.00%	30mv	15A	1.50%
800	50mv	25A	2.50%	70mv	35A	3.50%
1000	90mv	45A	4.50%	110mv	55A	5.50%

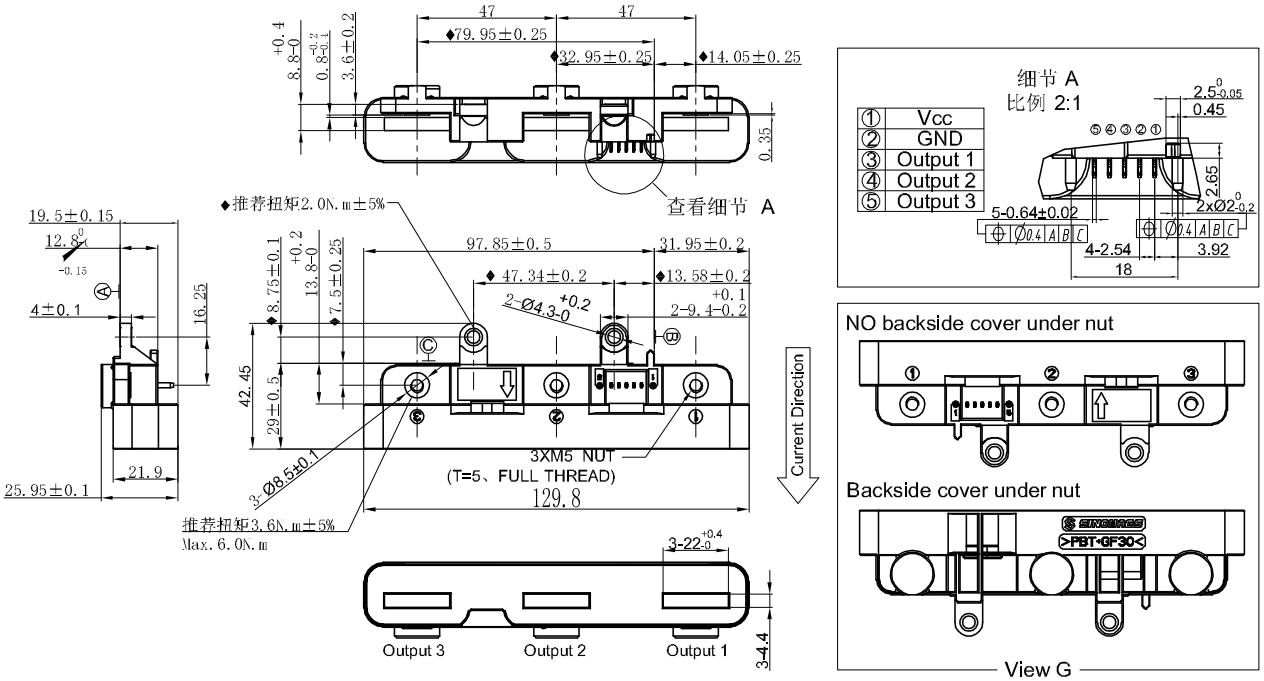
3. Product definition statement

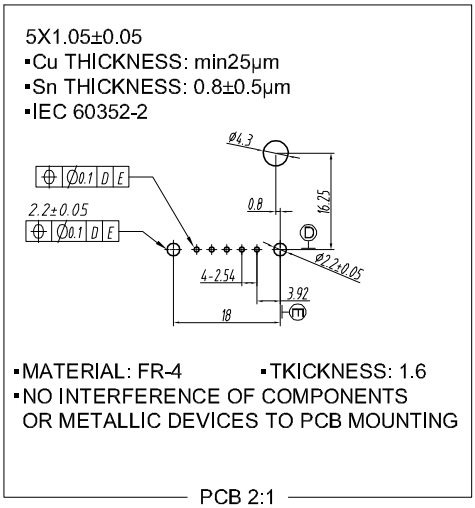


4. Electrical circuit diagram



5. Dimension & Pin definitions

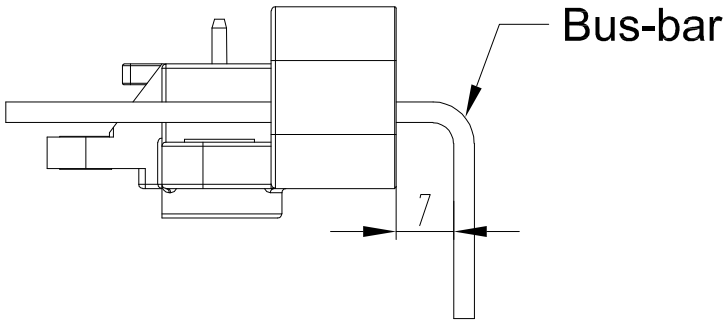




Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm

Remarks：

1. The clearance distance of the product is related to the installation mode of bus-bar .



6. Environmental test

Name	Test condition
Electrical tests	
Humidity test	85℃/85%,1000hr
Thermal shock	-40℃/125℃, 1000cycles
High temperature test	125℃, 1000hr
Low temperature test	-40℃, 1000hr
Insulation voltage	2.8kV, 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)

7. Important notice

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