



CURRENT SENSOR

PRODUCT SERIES: SHK-VBS8

PRODUCT PART NUMBER: SHK-800VBS8, SHK-1000VBS8
SHK-1200VBS8, SHK-1500VBS8
SHK-1600VBS8, SHK-2000VBS8

VERSION: Ver 1.3



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1. Description

The SHK-VBS8 series current sensor is based on HALL technology 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	170

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	V	8
ESD rating (HBM)	U_ESD	kV	4

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.

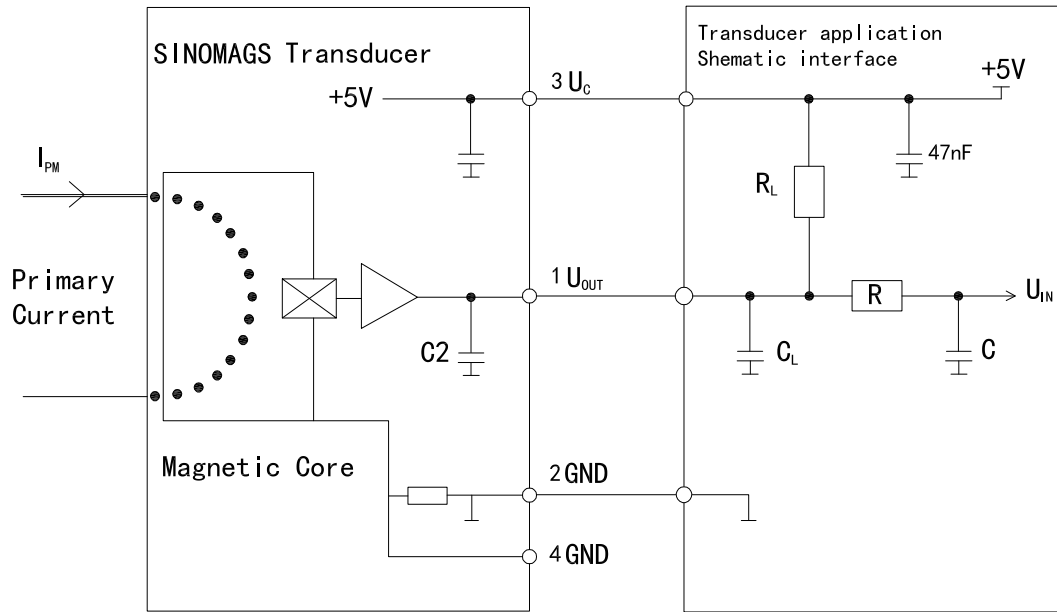
Isolation parameter

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	2.5	
Clearance distance (pri. -sec)	dCl	mm	6	
Creepage distance (pri. -sec)	dCp	mm	6	
Comparative tracking index	CTI		PLC3	
Case material			V0 according to UL 94	

Measuring current table

Product	Optimized Range I _{pm} (A)	Sensitivity, (mV/A)	T(°C)
SHK-800VBS8	± 800A	2.5	@U _C =5 V , T=25°C
SHK-1000VBS8	± 1000A	2	@U _C =5 V , T=25°C
SHK-1200VBS8	± 1200A	1.66	@U _C =5 V , T=25°C
SHK-1500VBS8	± 1500A	1.33	@U _C =5 V , T=25°C
SHK-1600VBS8	± 1600A	1.25	@U _C =5 V , T=25°C
SHK-2000VBS8	± 2000A	1	@U _C =5 V , T=25°C

System architecture(example)



2. Electrical data

Condition: $V_{CC} = 5.0\text{ V}$, $T_A = 25^\circ\text{C}$, unless specified.

Parameter	Symbol	Unit	Min	Typ	Max	Comment	Conditions
Current range (refer remark)	I_{PM}	A	-800		800	SHK-800VBS8	
	I_{PM}	A	-1000		1000	SHK-1000VBS8	
	I_{PM}	A	-1200		1200	SHK-1200VBS8	
	I_{PM}	A	-1500		1500	SHK-1500VBS8	
	I_{PM}	A	-1600		1600	SHK-1600VBS8	
	I_{PM}	A	-2000		2000	SHK-2000VBS8	
Supply voltage	V_{CC}	V	5 ± 5%			SHK-VBS8	
Current consumption	I_{CC}	mA		12		SHK-VBS8	@ $U_C=5\text{ V}$, $T=25^\circ\text{C}$
Quiescent voltage V_{out} @ 0 A	V_{off}	V	$\frac{V_{CC}}{2} + I_P * Sensitivity * \frac{V_{CC}}{5}$			SHK-VBS8	$I_P=0\text{ A}$
Output voltage V_{out}	V_{out}	V	$\frac{V_{CC}}{2} + I_P * Sensitivity * \frac{V_{CC}}{5}$			SHK-VBS8	
Peak output voltage (V_{out} @ $\pm I_{PM}$) – V_{off}	V_{FS}	V		± 2		SHK-VBS8	@ $U_C=5\text{ V}$, $T=25^\circ\text{C}$
Internal output resistance	R_{out}	Ω		1	10	V_{out}	DC to 1KHz
Load resistance	R_L	K Ω	10			SHK-VBS8	
Rated linearity error	Non-L	% I_{PN}		± 1		± I_{PN}	@ $U_C=5\text{ V}$, $T=25^\circ\text{C}$
Step response time	t_{res}	μs		3.5		@ 90% of I_{PN}	$di/dt=100\text{ A}/\mu\text{s}$
Frequency bandwidth (-3dB)	BW	kHz	40			No RC circuit	@ -3dB
Output voltage noise	V_{noise}	mVpp		10		SHK-VBS8	@ DC ~ 140 kHz
Temperature coefficient of V_{off}	TCV_{off}	mV	-18		18	SHK-VBS8	@ $-40^\circ\text{C} < T < 125^\circ\text{C}$
Accuracy @ 25°C	X	% of I_{PM}		± 2.25		All	@ $U_C=5\text{ V}$, $T=25^\circ\text{C}$
Accuracy @ $-40^\circ\text{C} \sim 125^\circ\text{C}$	X_TRa nge	% of I_{PM}	-3.25		3.25	All	@ $U_C=5\text{ V}$, $T=25^\circ\text{C}$

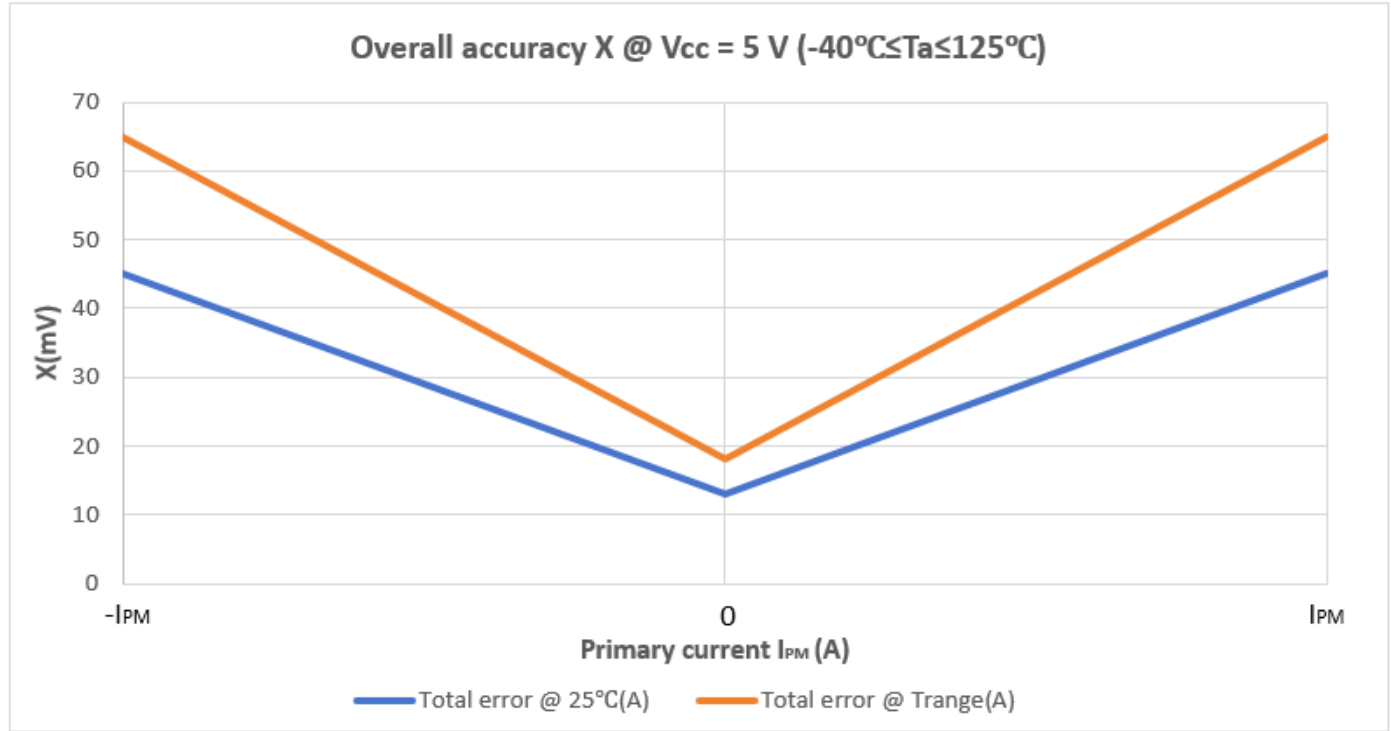
Note:

- Accuracy @ RT, $X = ((V_{out} @ I_n @ 25^\circ\text{C}) - (G_{fit} * I_n + V_{off} @ 25^\circ\text{C})) / V_{FS}$, Here I_n is the current test current. G_{fit} is the normal temperature fitting gain.
- Accuracy, $X_{TRange} = ((V_{out} @ I_n @ T_x) - (G_{fit}@25^\circ\text{C} * I_n + V_{off} @ 25^\circ\text{C})) / V_{FS}$, The fitting gain of the product at $G_{fit}@25^\circ\text{C}$ is 25°C .

Accuracy table:

SHK-VBS8:

Overall accuracy X specification				
I _{PM} (A)	@T _a = 25°C, V _{CC} = 5.0 V		@-40°C ≤ T _a ≤ 125°C, V _{CC} = 5.0 V	
- I _{PM}	45 mV	2.25%	65 mV	3.25%
0	13 mV	0.65%	18 mV	0.9%
I _{PM}	45 mV	2.25%	65 mV	3.25%



3. Precautions for use

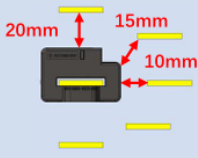
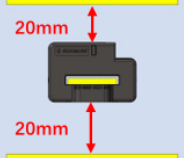
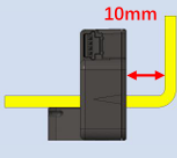
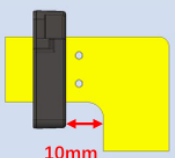
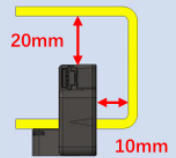
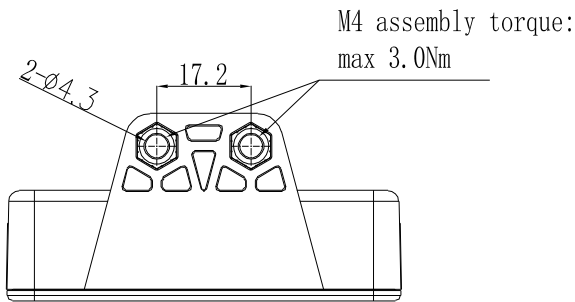
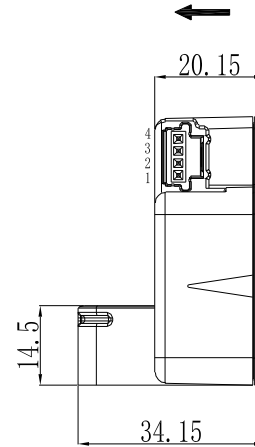
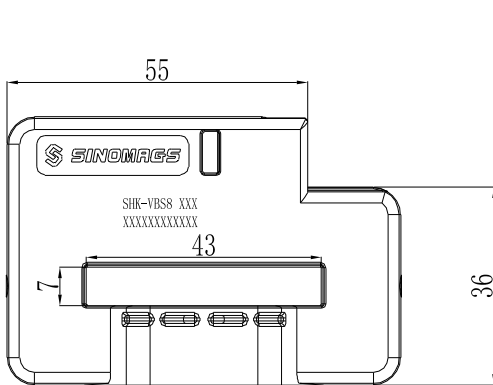
	Situation 1 Parallelism of the busbar to be tested with the space of the busbar not to be tested	Situation 2 Parallelism of the busbar to be tested with the space of the busbar not to be tested	Situation 3 L-shaped busbar installation	Situation 4 L-shaped busbar installation	Situation 5 U-shaped busbar row installation
illustrations					
Sensor accuracy for each mounting solution	<p>Non-tested busbar:</p> <ol style="list-style-type: none"> 1) 20mm from the top of the sensor: 1.5% accuracy 2) 45°&15mm from the top right of the sensor: 1% accuracy 3) 10mm from the right side of the sensor: 1% accuracy <p>The rest of the orientation refers to the opposite orientation distance</p>	<p>Non-tested busbar:</p> <ol style="list-style-type: none"> 1) 20mm from the top of the sensor: 1.5% accuracy 2) 20mm from the bottom of the sensor: 1% accuracy. 	L-shaped busbar mounting: Accuracy 1%	L-shaped busbar mounting: Accuracy 1%	L-shaped busbar mounting: Accuracy 1%

Fig.1 Precautions for use

Notes:

Wire Harness length: no special requirements, as short as possible to reduce the voltage drop.
 Wire Harness installation: need to separate high and low voltage; and the harness should have a shielding layer.

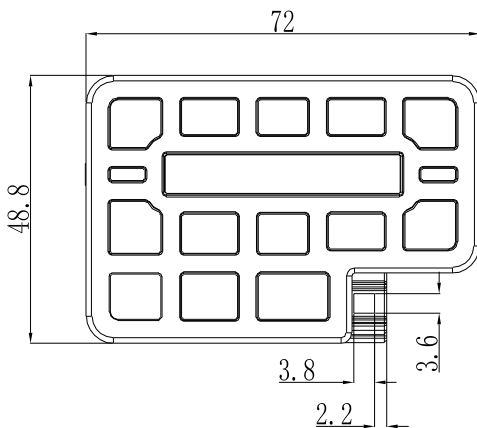
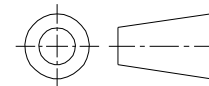
4. Dimension & Pin definitions



Terminals:

1	Vout
2	GND
3	Vcc
4	GND

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



Mechanical characteristics

- Connector type:TYCO connector P/N 1473672-1
- Material:
Housing: PBT with 30% GF,UL 94V-0,Black color.
Contacts: brass,H62, HV 116,0.64mm quadrilateral
- Finish:
Contacts: Matte-tin 3.0um min 5.0um max on solder tail , with entire contact underplated 4.0um min 5.0um max.
Nickel-palladium alloy