SINOMAGS
希 磁 科 技

# CURRENT SENSOR

| | |
|---|---|
| PRODUCT SERIES： | SHK-VBS8 |
| PRODUCT PART NUMBER： | SHK-800VBS8，SHK-1200VBS8<br>SHK-1500VBS8，SHK-1600VBS8<br>SHK-2000VBS8 |
| VERSION： | Ver 1.1 |


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# CONTENT

# 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
- 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 | 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.

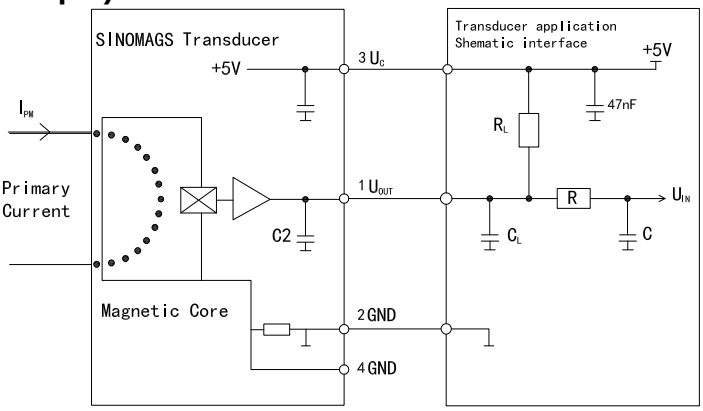
## Isolation parameter

| 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 traking index | CTI | | PLC3 | |
| Case material | | | V0 according to UL 94 | |

## Measuring current table

| **Product** | **Optimized Range I_pm (A)** | **Sensitivity, (mV/A)** | **T(℃)** |
|---|---|---|---|
| SHK-800VBS8 | ±800A | 2.5 | @$U_C$=5 V , T=25℃ |
| SHK-1200VBS8 | ±1200A | 1.66 | @$U_C$=5 V , T=25℃ |
| SHK-1500VBS8 | ±1500A | 1.33 | @$U_C$=5 V , T=25℃ |
| SHK-1600VBS8 | ±1600A | 1.25 | @$U_C$=5 V , T=25℃ |
| SHK-2000VBS8 | ±2000A | 1 | @$U_C$=5 V , T=25℃ |

**System architecture(example)**




## 2. Electrical data

Condition: Vcc = 5.0 V, T_A = 25℃, unless specified.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment | Conditions |
|---|---|---|---|---|---|---|---|
| Current range (refer remark) | $I_{PM}$ | A | -800 | | 800 | SHK-800VBS8 | |
| | $I_{PM}$ | 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 | Vcc | V | 5 ± 5% | | | SHK-VBS8 | |
| Current consumption | Icc | mA | | 12 | | SHK-VBS8 | @$U_C$=5 V , T=25℃ |
| Quiescent voltage Vout @ 0 A | Voff | V | (VCC/5)×(Voff+G×IP) | | | SHK-VBS8 | |
| Peak output voltage (Vout @ ±$I_{PM}$) – Voff | V_FS | V | | ± 2 | | SHK-VBS8 | @$U_C$=5 V , T=25℃ |
| Internal output resistance | R_out | Ω | | 1 | 10 | Vout | DC to 1KHz |
| Load resistance | R_L | KΩ | 10 | | | SHK-VBS8 | |
| Rated linearity error | Non-L | % $I_{PN}$ | | ± 1 | | ±$I_{PN}$ | @$U_C$=5 V , T=25℃ |
| Step response time | t_res | μs | | 3.5 | | @90% of $I_{PN}$ | di/dt=100A/μs |
| Frequency bandwidth (-3dB) | BW | kHz | 40 | | | No RC circuit | @ -3dB |
| Output voltage noise | Vnoise | mVpp | | 10 | | SHK-VBS8 | @ DC ~ 140 kHz |
| Temperature coefficient of $V_{off}$ | TC$V_{off}$ | mV | -18 | | 18 | SHK-VBS8 | @-40℃<T<125℃ |
| Accuracy @ 25℃ | X | % of $I_{PM}$ | | ±2.25 | | All | @$U_C$=5 V , T=25℃ |
| Accuracy @ -40℃ ~ 125℃ | X_TRange | % of $I_{PM}$ | -3.25 | | 3.25 | All | @$U_C$=5 V , T=25℃ |

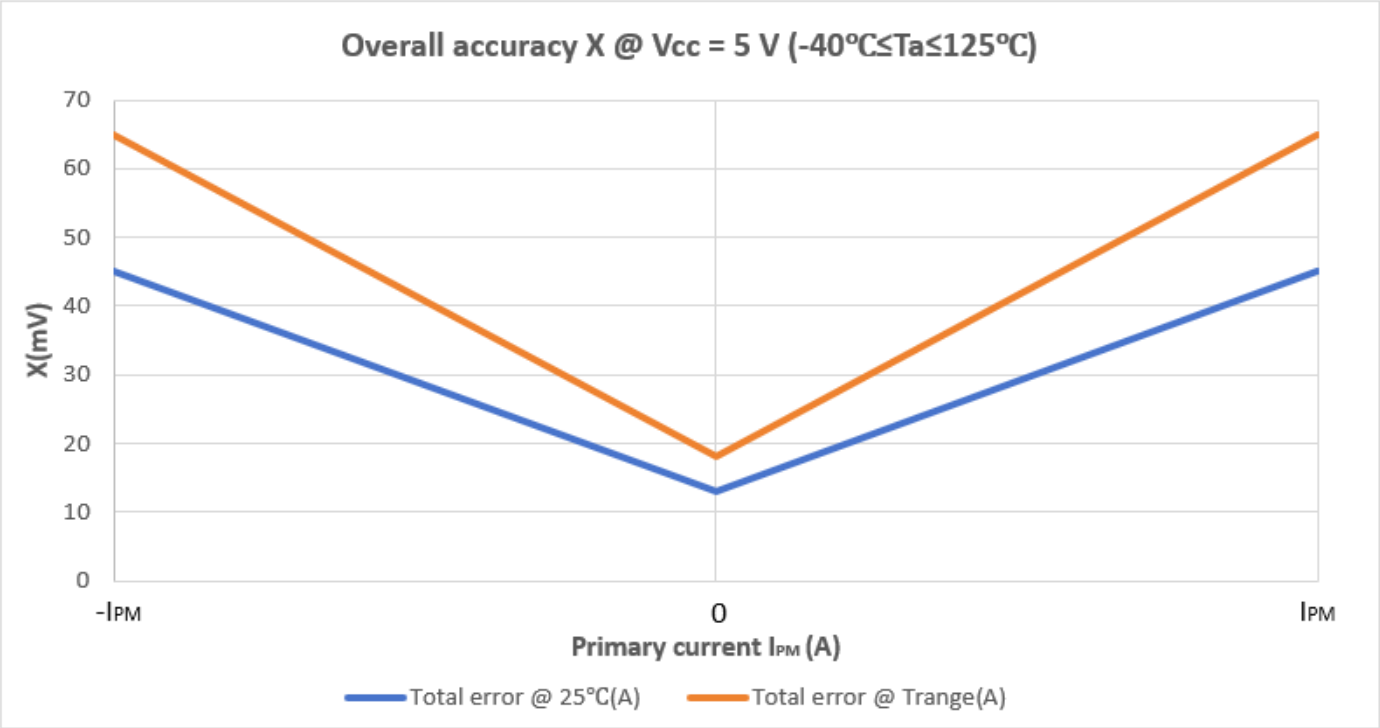
Note:

1. Accuracy @ RT,X = ((Vout @ In @ 25℃) – (G_fit * In+Voff @ 25℃)) / V_FS,Here In is the current test current. G_fit is the normal temperature fitting gain.
2. Accuracy,X_TRange = ((Vout @ In @ T_x) – (G_fit@25℃ * In+Voff @ 25℃)) / V_FS,The fitting gain of the product at G_fit@25 ℃ is 25 ℃.

## Accuracy table：

### SHK-VBS8：

| Overall accuracy X specification | | | | |
|---|---|---|---|---|
| $I_{PM}$(A) | @$T_a$ = 25℃,$V_{CC}$ = 5.0 V | | @-40℃≤$T_a$ ≤125℃,$V_{CC}$ = 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

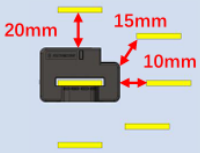
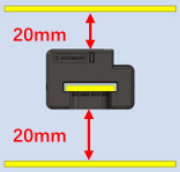
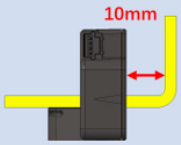
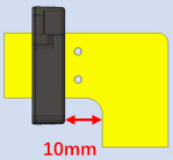
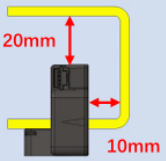
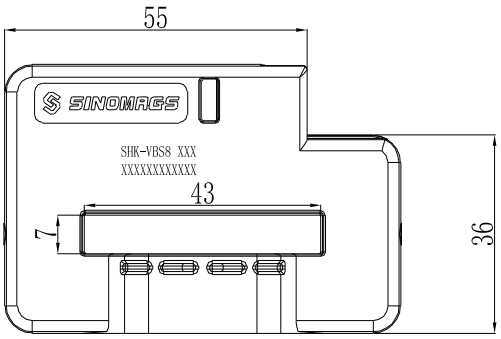
| | Situation 1<br>Parallelism of the busbar to be tested with the space of the busbar not to be tested | Situation 2<br>Parallelism of the busbar to be tested with the space of the busbar not to be tested | Situation 3<br>L-shaped busbar installation | Situation 4<br>L-shaped busbar installation | Situation 5<br>U-shaped busbar row installation |
|---|---|---|---|---|---|
| illustrations |  |  |  |  |  |
| Sensor accuracy for each mounting solution | Non-tested busbar:<br>1) 20mm from the top of the sensor: 1.5% accuracy<br>2) 2) 45°&15mm from the top right of the sensor: 1% accuracy<br>3) 10mm from the right side of the sensor: 1%accuracy<br>The rest of the orientation refers to the opposite orientation distance | Non-tested busbar:<br>1) 20mm from the top of the sensor: 1.5% accuracy<br>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% |

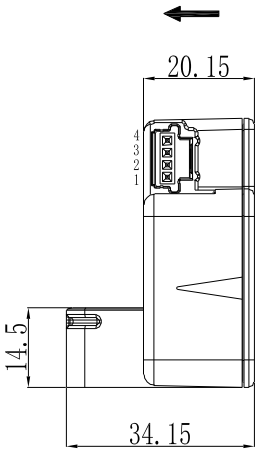
Fig.1 Precautions for use

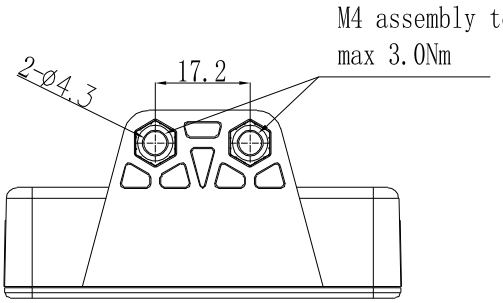
## Notes:

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



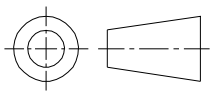



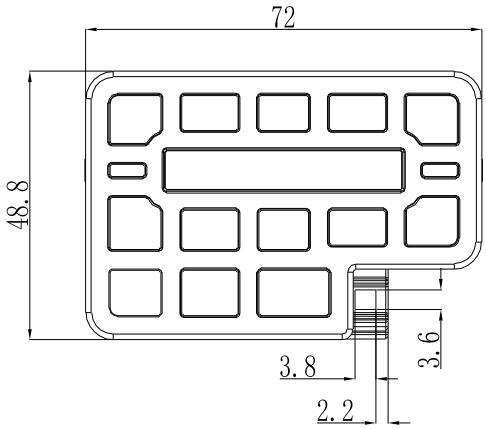




Terminals:

| | |
|---|---|
| 1 | Vout |
| 2 | GND |
| 3 | Vcc |
| 4 | GND |

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






Mechanical characteristics
1.Connector type:TYCO connector P/N 1473672-1
2.Material:
Housing: PBT with 30% GF,UL 94V-0,Black color.
Contacts: brass,H62, HV 116,0.64mm quadrilateral
3.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