

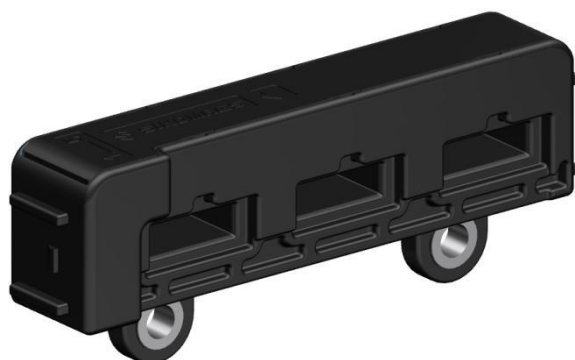
## Current Sensor

---

Product Series: SHK-VBS-T

Part number: SHK-VBS-TA-700-S2

Version: Ver 1.7.4



Sinomags Technology Co., Ltd

Web site: [www.sinomags.com](http://www.sinomags.com)

## CONTENT

|                                       |   |
|---------------------------------------|---|
| 1. Description.....                   | 2 |
| 2. Electrical data.....               | 3 |
| 3. Product definition statement ..... | 5 |
| 4. Electrical circuit diagram .....   | 5 |
| 5. Dimension & Pin definitions .....  | 6 |
| 6. Environmental test.....            | 7 |
| 7. Important notice .....             | 7 |

## 1. Description

The SHK-VBS-TA 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
- Converters
- Motor drive application
- Battery Management

### General parameter

| Parameter           | Symbol           | Unit               | Value     |
|---------------------|------------------|--------------------|-----------|
| Working temperature | $T_a$            | $^{\circ}\text{C}$ | -40 ~ 150 |
| Storage temperature | $T_{\text{stg}}$ | $^{\circ}\text{C}$ | -40 ~ 150 |
| Mass                | m                | g                  | 60        |

### Absolute maximum rating

| Parameter                       | Symbol           | Unit | Value                        |
|---------------------------------|------------------|------|------------------------------|
| Supply voltage                  | $V_{\text{cc}}$  | V    | -0.3 ~ 10<br>(Not operating) |
|                                 |                  |      | 6.5                          |
| Electrostatic discharge voltage | $U_{\text{ESD}}$ | kV   | 8<br>(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         | 2.5                   | RMS voltage for AC test 50Hz/1 min |
| Insulation resistance          | $R_{\text{is}}$ | M $\Omega$ | 500                   | DC 1kV/1 min                       |
| Clearance distance (pri. -sec) | $d_{\text{Cl}}$ | mm         | 8.0                   | Shortest distance through air      |
| Creepage distance (pri. -sec)  | $d_{\text{Cp}}$ | mm         | 8.0                   | Shortest path along device body    |
| Comparative tracking index     | CTI             |            | PLC 3                 |                                    |
| Case material                  |                 |            | V0 according to UL 94 |                                    |

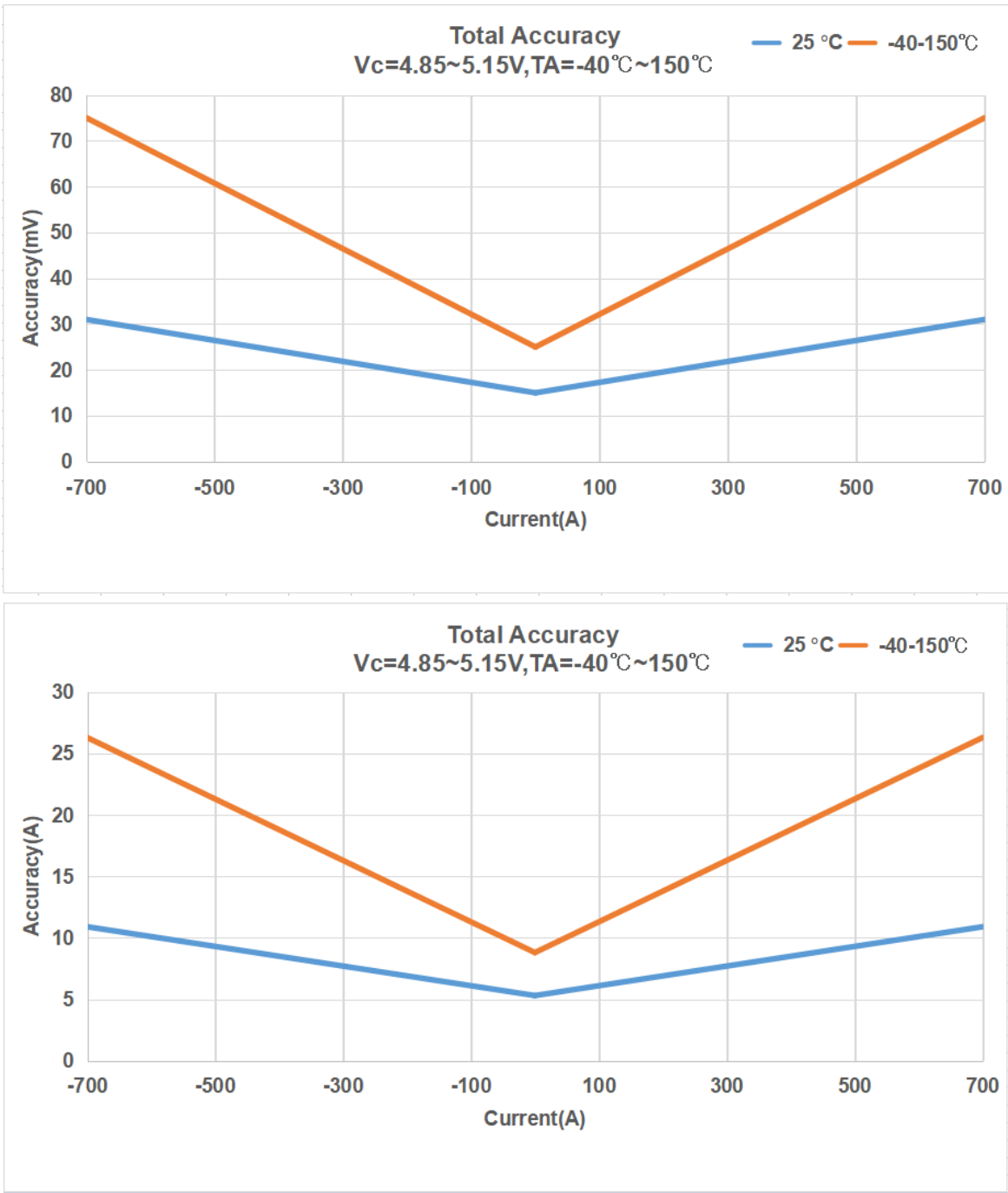
### Selection Guide

| Product           | Nominal current | Measuring range |
|-------------------|-----------------|-----------------|
| SHK-VBS-TA-700-S2 | 700 A           | 700 A           |

## 2. Electrical data

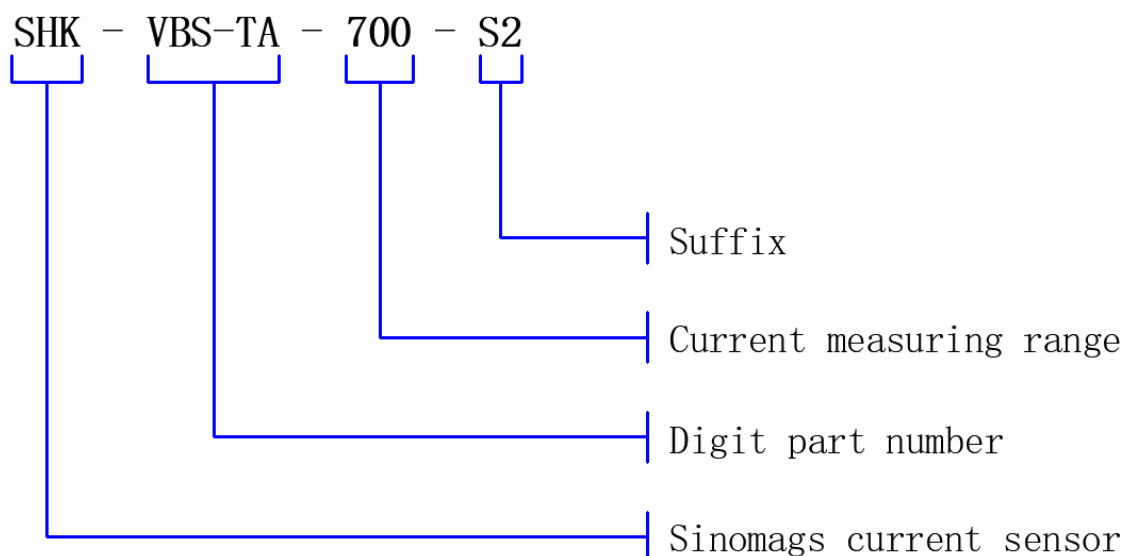
| Parameter                          | Symbol       | Unit                 | Min                                             | Typ        | Max   | Comment                                                                         |
|------------------------------------|--------------|----------------------|-------------------------------------------------|------------|-------|---------------------------------------------------------------------------------|
| Primary current measuring range    | $I_{PM}$     | A                    | -700                                            |            | 700   | SHK-VBS-TA-700-S2                                                               |
| Supply voltage                     | $V_{CC}$     | V                    | 4.75                                            |            | 5.25  |                                                                                 |
| Current consumption                | $I_{CC}$     | mA                   |                                                 | 39         | 45    | @ $V_{CC} = 5.0\text{ V}$                                                       |
| 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                    | 2.49                                            | 2.5        | 2.51  | @ $T_a = 25^\circ\text{C}$ ,<br>$V_{CC} = 5.0\text{ V}$                         |
| Sensitivity                        | G            | mV/A                 |                                                 | 2.857      |       | @ $T_a = 25^\circ\text{C}$ ,<br>$V_{CC} = 5.0\text{ V}$                         |
| Load resistance                    | $R_L$        | k $\Omega$           | 10                                              |            | 100   |                                                                                 |
| Ratiometricity error               | $\epsilon_r$ | %                    | -0.5                                            |            | 0.5   | @ $4.85\text{V} \leq V_{CC} \leq 5.15\text{V}$                                  |
| Sensitivity error                  | $\epsilon_G$ | %                    | -0.75                                           |            | 0.75  | @ $T_a = 25^\circ\text{C}$ ,<br>$V_{CC} = 5.0\text{ V}$                         |
| Magnetic offset voltage error      | $V_{OM}$     | mV                   | -3                                              | $\pm 2$    | 3     | @ $T_a = 25^\circ\text{C}$ ,<br>$V_{CC} = 5.0\text{ V}$ ,<br>after $\pm I_{PM}$ |
| Ave. Temp. coefficient of $V_{OE}$ | $TCV_{OEAV}$ | mV/ $^\circ\text{C}$ | -0.15                                           | $\pm 0.05$ | 0.15  | @ $-40^\circ\text{C} \leq T_a \leq 150^\circ\text{C}$                           |
| Ave. Temp. coefficient of G        | $TCG_{AV}$   | %/ $^\circ\text{C}$  | -0.025                                          | $\pm 0.01$ | 0.025 | @ $-40^\circ\text{C} \leq T_a \leq 150^\circ\text{C}$                           |
| Linearity                          | $\epsilon_L$ | %                    | -0.75                                           | $\pm 0.35$ | 0.75  | @ $T_a = 25^\circ\text{C}$ ,<br>$V_{CC} = 5.0\text{ V}$ ,<br>$I = I_{PM}$       |
| Response time                      | $T_r$        | $\mu\text{s}$        |                                                 | 2          | 5     | @ 90% of $I_{PM}$                                                               |
| Frequency bandwidth (-3 dB)        | BW           | kHz                  | 40                                              |            |       | No RC circuit                                                                   |
| Output voltage noise               | $V_{no}$     | mVpp                 |                                                 | 20         |       | @ DC ~ 10 kHz                                                                   |
| Power on delay                     | $T_{POD}$    | ms                   |                                                 |            | 1     |                                                                                 |

Total error(mV) for  $\leq 700\text{A}$

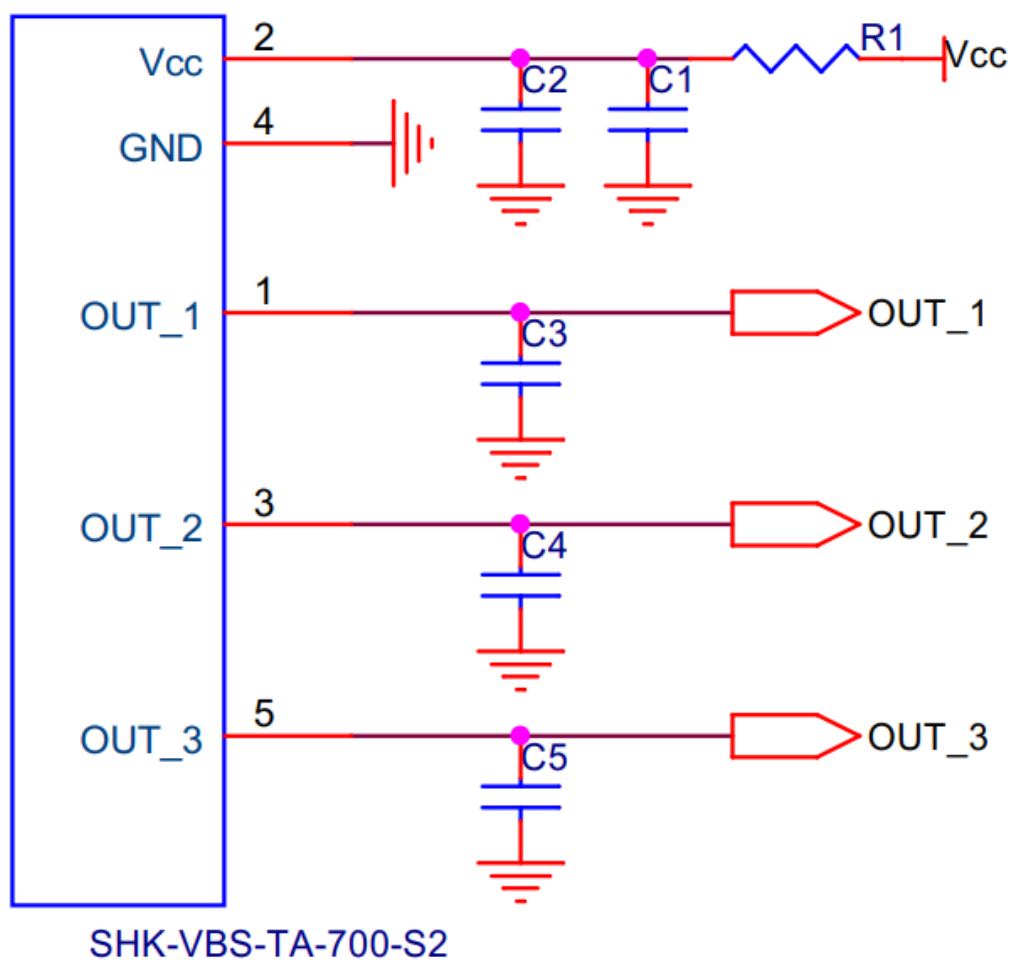


| Accuracy    | Specification |      |      | Unit | Note | Accuracy    | Specification |     |      | Unit | Note |
|-------------|---------------|------|------|------|------|-------------|---------------|-----|------|------|------|
|             | - 700A        | 0A   | 700A |      |      |             | -700A         | 0A  | 700A |      |      |
| 25°C        | 31.0          | 15.0 | 31.0 | mv   |      | 25°C        | 10.9          | 5.3 | 10.9 | A    |      |
| -40°C~125°C | 63.0          | 23.0 | 63.0 | mv   |      | -40°C~125°C | 22.1          | 8.1 | 22.1 | A    |      |
| -40°C~150°C | 75.0          | 25.0 | 75.0 | mv   |      | -40°C~150°C | 26.3          | 8.8 | 26.3 | A    |      |

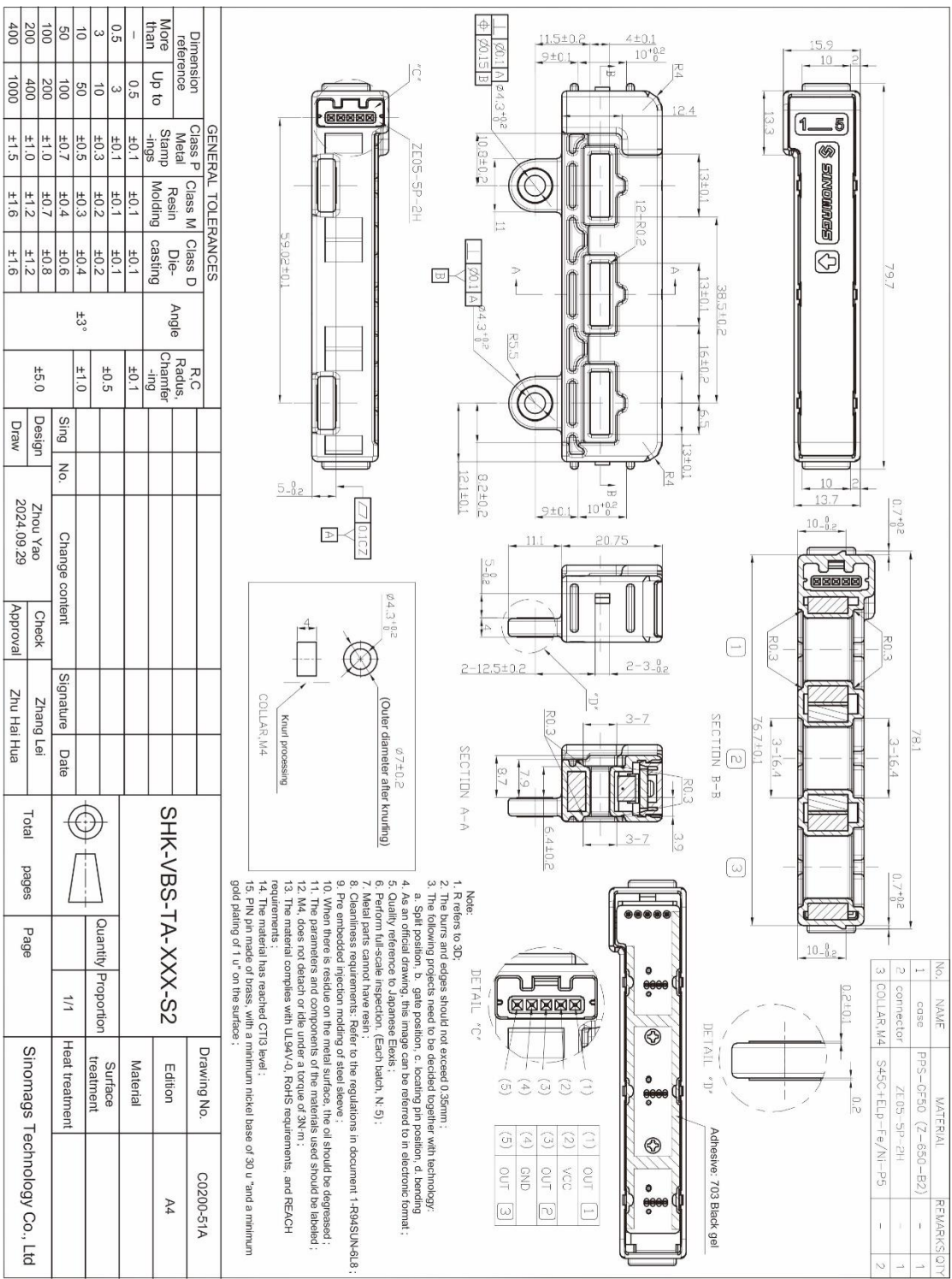
### 3. Product definition statement



### 4. Electrical circuit diagram



5. Dimension & Pin definitions



## 6. 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)       |

## 7. Important notice

This datasheet and any information contained therein may not be reproduced in whole or in part without the prior permission from Sinomags. The content of this information may be changed without notice for purposes such as improvement. Make sure you have the latest information when using the current sensor.