

# Current Sensor

Product Series: SHK-VBS-T

Part number: SHK-VBS-T8-1000-S5

Version: Ver 1.5



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## 1. Description

The SHK-VBS-T8-S5 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
- 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	144

### 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

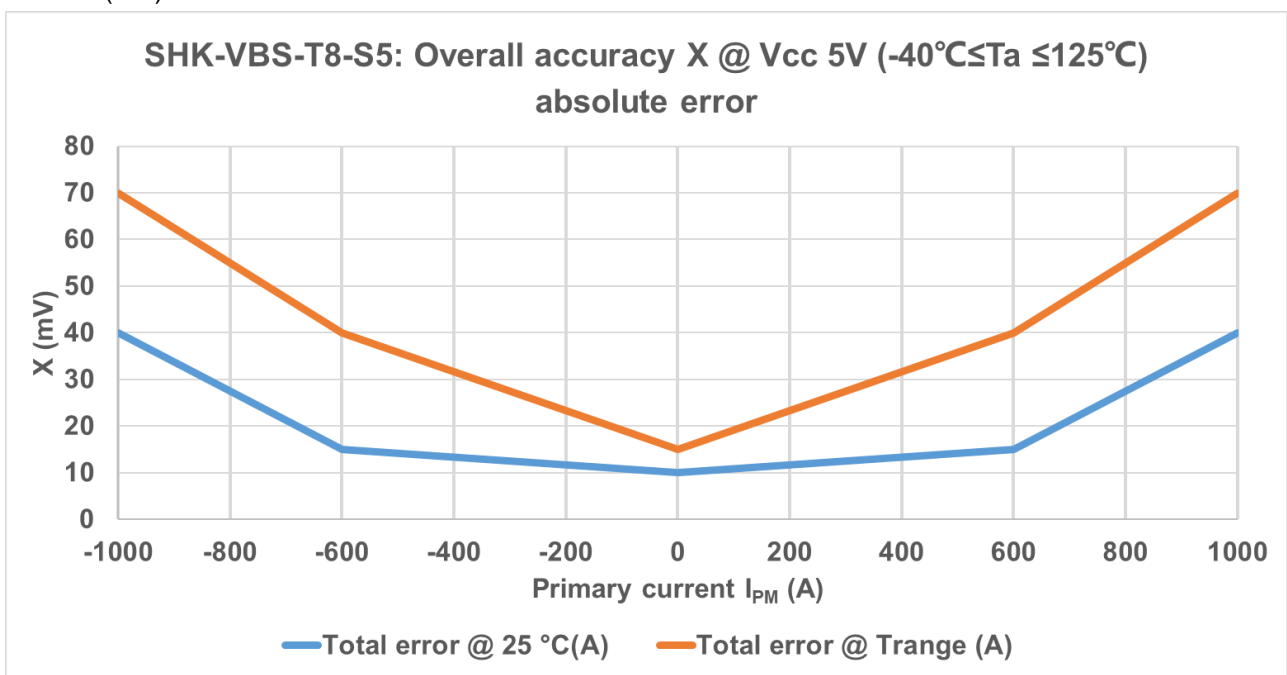
Parameter	Symbol	Unit	Value	Comment
Insulation voltage	$U_d$	kV	2.5	RMS voltage for AC test 50Hz-1 min
Insulation resistance	$R_{INS}$	MΩ	500	DC 500V, ISO 16750
Clearance distance (pri. -sec)	$d_{Cl}$	mm	5.1	Shortest distance through air
Creepage distance (pri. -sec)	$d_{Cp}$	mm	5.1	Shortest path along device body
Comparative tracking index	CTI		PLC 3	
Case material			V0 according to UL 94	

## 2. Electrical data

Condition :  $T_a = 25^{\circ}\text{C}$ ,  $V_{CC} = 5.0\text{ V}$

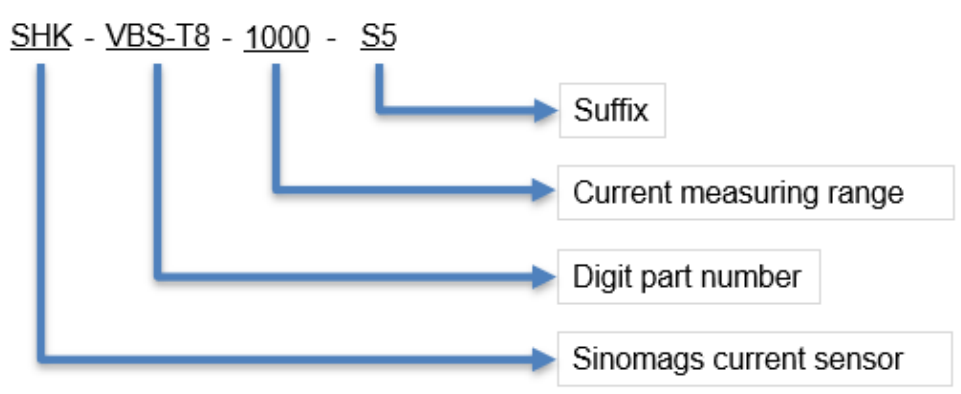
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	$I_{PM}$	A	-1000		1000	SHK-VBS-T8-1000-S5
Supply voltage	$V_{CC}$	V	4.75	5	5.25	All
Current consumption	$I_{CC}$	mA		39	60	@ $V_{CC} = 5.0\text{ V}$
Output voltage	$V_{OUT}$	V	$(V_{CC}/5) \times (V_{off} + G \times I_{PM})$			@ $T_a = 25^{\circ}\text{C}$
Quiescent voltage	$V_{off}$	V		2.5		@ $T_a = 25^{\circ}\text{C}$ , $V_{CC} = 5.0\text{ V}$
Sensitivity	G	mV/A		2.00		SHK-VBS-T8-1000-S5
Load resistance	$R_L$	k $\Omega$	10			
Ratiometricity error	$\epsilon_r$	%		$\pm 0.5$		@ $4.75\text{V} \leq V_{CC} \leq 5.25\text{V}$
Sensitivity error	$\epsilon_G$	%		$\pm 1$		@ $T_a = 25^{\circ}\text{C}$ , After $T^{\circ}$ Cycles
Electrical offset voltage error	$V_{OE}$	mV		$\pm 4.0$		@ $T_a = 25^{\circ}\text{C}$ , $V_{CC} = 5.0\text{ V}$
Magnetic offset voltage error	$V_{OM}$	mV	-7.5		7.5	@ $T_a = 25^{\circ}\text{C}$ , $V_{CC} = 5.0\text{ V}$
Ave. Temp. coefficient of $V_{OE}$	$TCV_{OEAV}$	mV/ $^{\circ}\text{C}$	-0.08		0.08	@ $-40^{\circ}\text{C} < T_a < 125^{\circ}\text{C}$
Ave. Temp. coefficient of S	$TCS_{AV}$	%/ $^{\circ}\text{C}$	-0.03	$\pm 0.01$	0.03	@ $-40^{\circ}\text{C} < T_a < 125^{\circ}\text{C}$
Linearity error	$\epsilon_L$	% $I_P$	-1		1	of Full range, $-1000\text{ A} \leq I_P \leq 1000\text{ A}$ @ $T_a = 25^{\circ}\text{C}$ , $V_{CC} = 5.0\text{ V}$
Response time	$T_r$	$\mu\text{s}$		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  $\leq 1000A$

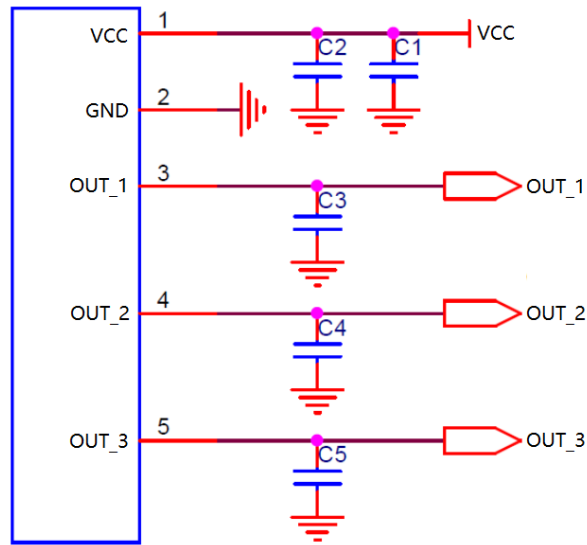


Overall accuracy X specification(mV)				
$I_{PM}(A)$	@Ta=25°C, VCC=5.0V		@-40°C ≤ Ta ≤ 125°C, VCC=5.0V	
1000	40	2.00%	70	3.50%
600	15	0.75%	40	2.00%
0	10	0.50%	15	0.75%
-600	15	0.75%	40	2.00%
-1000	40	2.00%	70	3.50%

### 3. Product definition statement



## 4. Electrical circuit diagram

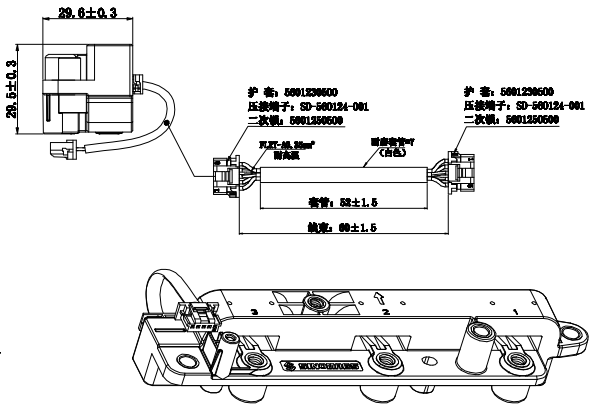
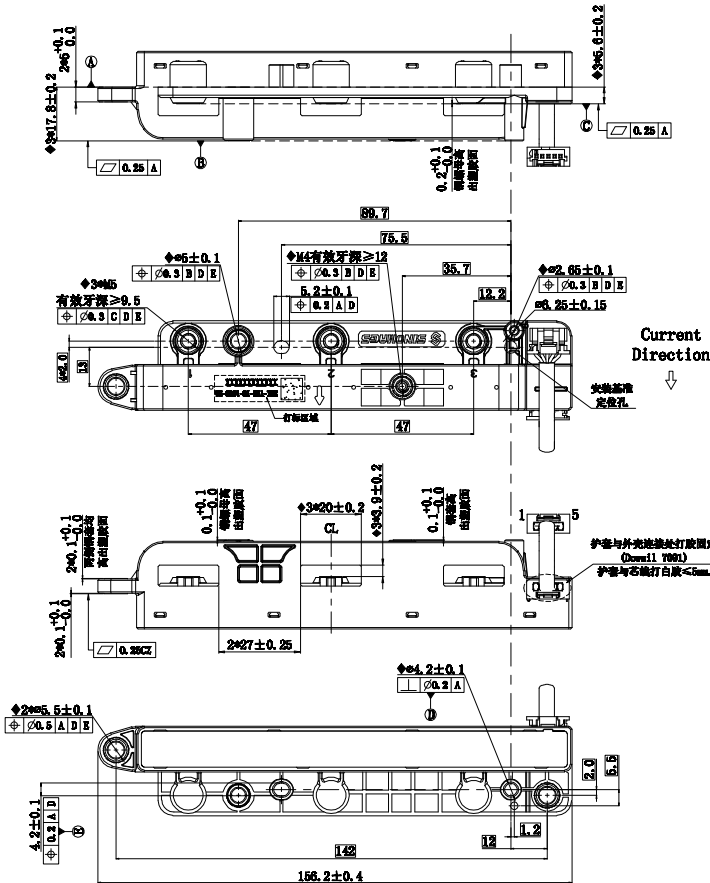


### Remarks:

Capacitor recommended specification:

C1	1uF
C2	100nF
C3、C4、C5	1Nf

### 5. Dimension & Pin definitions



**Terminals:**

Pin 1	Vcc(+5V)
Pin 2	GND
Pin 3	Yout-1
Pin 4	Yout-2
Pin 5	Yout-3

Material : Fit UL94V-0 & RoHS requirements ;  
General tolerance :  $\pm 0.5$   
Unit : mm



1. 传感器表面及接插件内部应清洁无油污，无裂纹、划伤、飞边和锈蚀等缺陷；
2. 传感器总成工作温度范围：(-40~125)℃；
3. 传感器总成工作电压：(5±0.25)V；测量范围：-1000A~1000A，对应输出电压为：(10~90%)Vcc；零点电压1/2Vcc；响应时间<4us；
4. 传感器总成工作电流≤60mA；
5. 传感器精度如下表所示：

Iw(A)	T=25°		-40° ≤ T ≤ 125°	
	±40mA	±2.00%	±70mA	±3.50%
600	±15mA	±0.75%	±40mA	±2.00%
0	±10mA	±0.50%	±15mA	±0.75%
-600	±15mA	±0.75%	±40mA	±2.00%
-1000	±40mA	±2.00%	±70mA	±3.50%

6. 传感器总成接插件端子镀锡，要求对配线束端子镀层与之保持一致；
7. 图示打印区域打印长安标识、生产日期、供应商代码、零部件号；
8. 图上未注明的性能要求应满足CTS-S21.55.25-A《电流传感器技术规范》所规定的技术要求。