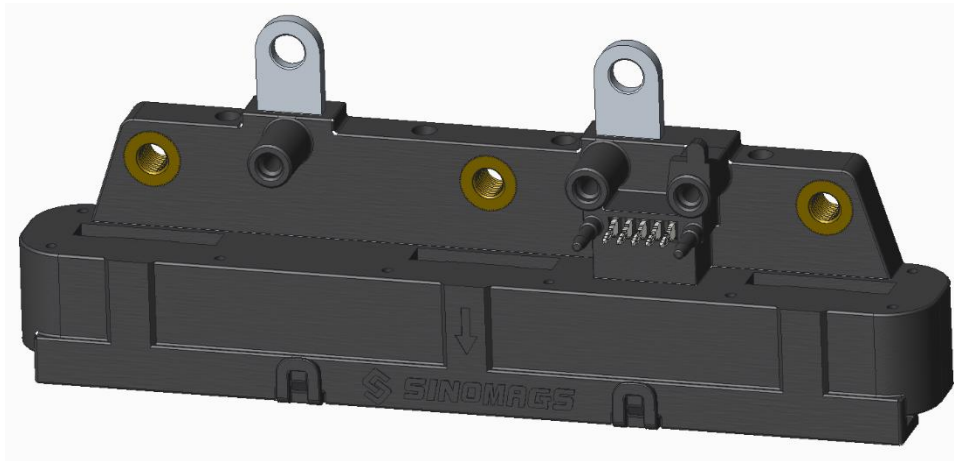


Current Sensor

Product Series: SHK-VBS-T

Part number: SHK-VBS-T6-800-S3
SHK-VBS-T6-900-S3
SHK-VBS-T6-1000-S3
SHK-VBS-T6-1100-S3
SHK-VBS-T6-1200-S3

Version: Ver 1.1



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1. Description

The SHK-VBS-T6 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
- Inverter
- Electric welder power supply
- 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	126

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	V_{cc}	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

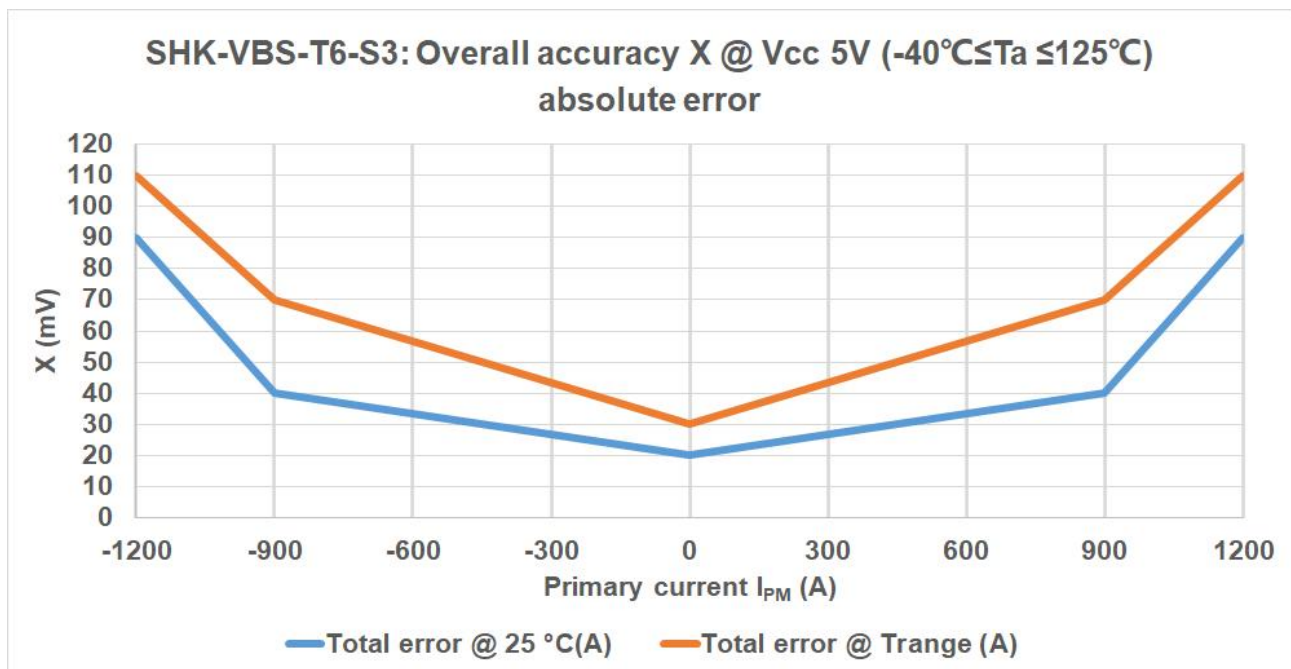
Parameter	Symbol	Unit	Value	Comment
Insulation voltage	U_d	kV	2.5	RMS voltage for AC test 50Hz-1 min
Insulation resistance	R_{INS}	MΩ	500	500 V DC, ISO 16750
Clearance distance (pri. -sec)	d_{Cl}	mm	4	Shortest distance through air
Creepage distance (pri. -sec)	d_{cp}	mm	5.1	Shortest path along device 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	-800		800	SHK-VBS-T6-800-S3
			-900		900	SHK-VBS-T6-900-S3
			-1000		1000	SHK-VBS-T6-1000-S3
			-1100		1100	SHK-VBS-T6-1100-S3
			-1200		1200	SHK-VBS-T6-1200-S3
Supply voltage	V_{CC}	V	4.75	5	5.25	All
Current consumption	I_{CC}	mA		45	60	@ $V_{CC} = 5.0\text{ V}$
Output voltage	V_{OUT}	V	$(V_{CC}/5) \times (V_{off} + G \times I_P)$			@ $T_a = 25^\circ\text{C}$
Quiescent voltage	V_{off}	V		2.5		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Sensitivity	G	mV/A		2.50		SHK-VBS-T6-800-S3
				2.22		SHK-VBS-T6-900-S3
				2.00		SHK-VBS-T6-1000-S3
				1.82		SHK-VBS-T6-1100-S3
				1.67		SHK-VBS-T6-1200-S3
Load resistance	R_L	k Ω	10			
Ratiometricity error	ϵ_r	%		± 0.5		@ $4.75\text{ V} \leq V_{CC} \leq 5.25\text{ V}$
Sensitivity error	ϵ_G	%		± 1		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Electrical offset voltage error	V_{OE}	mV		± 2.0		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Magnetic offset voltage error	V_{OM}	mV		± 2.0		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, after $\pm I_{PM}$
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/ $^\circ\text{C}$		± 0.04		@ $-40^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$
Ave. Temp. coefficient of S	TCS_{AV}	%/ $^\circ\text{C}$		± 0.02		@ $-40^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$
Linearity error	ϵ_L	% I_P	-0.5		0.5	% of Full range, $-1000\text{ A} < I_P < 1000\text{ A}$
			-2		2	% of Full range, $1000\text{ A} < I_P < 1200\text{ A}$

Accuracy @ 25°C	E _{TOT}	% of I _P	-2		2	@ T _a = 25°C, V _{CC} = 5.0 V -1000 A < I _P < 1000 A
			-4.5		4.5	@ T _a = 25°C, V _{CC} = 5.0 V 1000 A < I _P < 1200 A
Accuracy @ -40°C ~ 125°C	E _{TOT}	% of I _P	-3.5		3.5	@ -40°C ≤ T _a ≤ 125°C, V _{CC} = 5.0 V -1000 A < I _P < 1000 A
			-5.5		5.5	@ -40°C ≤ T _a ≤ 125°C, V _{CC} = 5.0 V 1000 A < I _P < 1200 A
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(mV) for I_P


Overall accuracy X specification						
I _{PM} (A)	@T _a =25°C, V _{CC} =5.0V			@-40°C ≤ T _a ≤ 125°C, V _{CC} =5.0V		
-1200	90mV	54A	4.50%	110mV	66A	5.50%
-1000	40mV	24A	2.00%	70mV	42A	3.50%
-100	22.22mV	13.33A	---	34.44mV	20.66A	---
0	20mV	12A	1.00%	30mV	18A	1.50%
100	22.22mV	13.33A	---	34.44mV	20.66A	---
1000	40mV	30A	2.00%	70mV	42A	3.50%
1200	90mV	54A	4.50%	110mV	66A	5.50%

3. Dimension & Pin definitions

