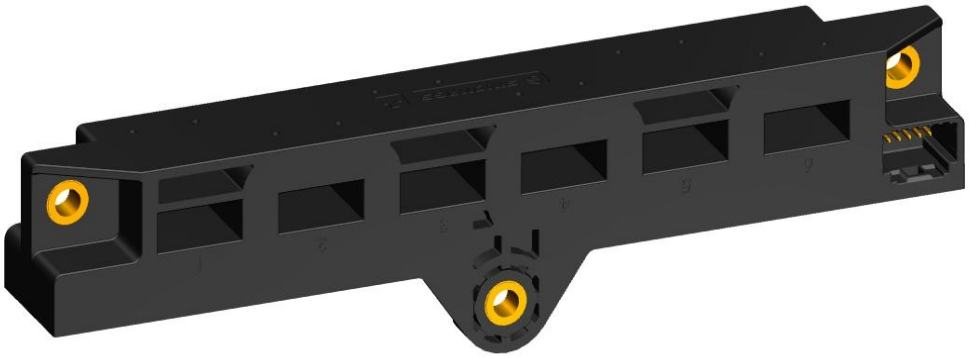
Current Sensor

Product Series: SHK-VBS-T7-S2

Part number: SHK-VBS-T7-600-S2
SHK-VBS-T7-700-S2

Version: Ver 1.4



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CONTENT

1. Description

The SHK-VBS-T7-S2 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	℃	-40 ~ 125
Storage temperature	T_{stg}	℃	-40 ~ 125
Mass	m	g	255

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	V	-0.5 ~ 8 (Not operating)
			-0.5 ~ 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 1000V，ISO 16750
Clearance distance (pri. -sec)	d_{Cl}	mm	4.2	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	4.2	Shortest path along device body
Comparative trraking index	CTI		PLC 3	
Case material			V0 according to UL 94	

Selection Guide

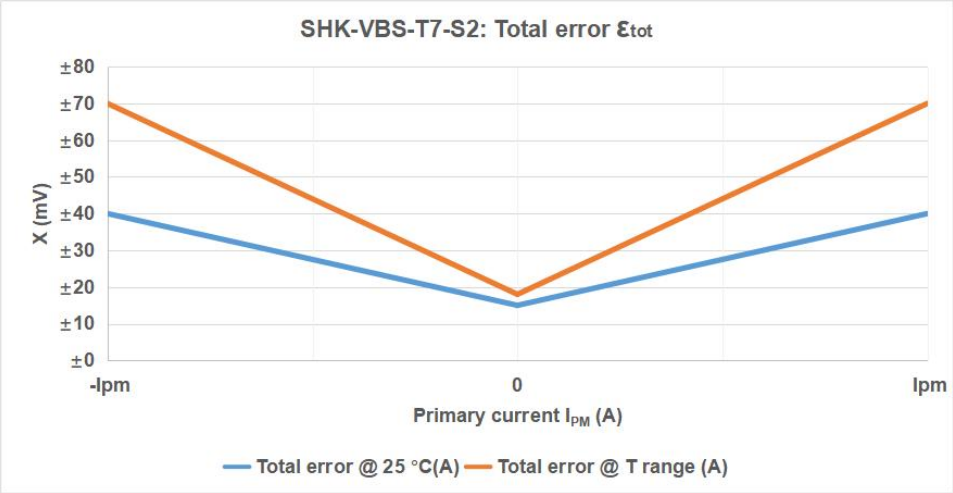
Product	**Channel range**	**Channel range**
SHK-VBS-T7-600-S2	±300 A：OUT - 4、5、6	±600 A：OUT – 1、2、3
SHK-VBS-T7-700-S2	±400 A：OUT - 1、2、3	±700 A：OUT – 4、5、6

2. Electrical data

Condition: T_a = 25℃, V_{CC} = 5.0 V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-300		300	SHK-VBS-T7-600-S2
			-600		600	
			-400		400	SHK-VBS-T7-700-S2
			-700		700	
Supply voltage	V_{CC}	V	4.75	5	5.25	All
Current consumption	I_{CC}	mA		90	120	@ V_{CC}= 5.0 V
Output voltage	V_{OUT}	V	$(V_{CC}-5)\times(V_{off}+G\times I_{PM})$			@ T_a = 25℃
Quiescent voltage	V_{off}	V		2.5		@ T_a = 25℃, V_{CC} = 5.0 V
Sensitivity	G	mV/A		6.67		I_{PM} = ±300A
				3.33		I_{PM} = ±600A
				5		I_{PM} = ±400A
				2.85		I_{PM} = ±700A
Load resistance	R_L	kΩ	10			
Ratiometricity error	ε_r	%		±0.5		@ 4.75V ≤ V_{CC} ≤ 5.25V
Sensitivity error	ε_G	%		±1		@ T_a = 25 °C
Electrical offset voltage error	V_{OE}	mV		±2.0		@ T_a = 25℃, V_{CC} = 5.0 V
Magnetic offset voltage error	V_{OM}	mV		±7.0		@ T_a = 25℃, V_{CC} = 5.0 V
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/℃		±0.04		@ -40℃<T_a <125℃
Ave. Temp. coefficient of S	TCS_{AV}	%/℃		±0.02		@ -40℃<T_a <125℃
Linearity error	ε_L	% I_P		±1		of Full range
Response time	T_r	μs		2	4	@ 90% of I_{PM}
Frequency bandwidth (-3 dB)	BW	kHz	40			No RC circuit
Output voltage noise	V_{no}	mVpp			20	@ DC ~ 1 MHz

Total error(mV)



Total error specification				
I_{PM}(A)	@Ta=25℃，VCC=5.0V		@-40℃≤Ta≤125℃，VCC=5.0V	
-I_{PM}	40mv	±2%	70mv	±3.5%
0	15mv	±0.75%	18mv	±0.9%
I_{PM}	40mv	±2%	70mv	±3.5%

3. Dimension & Pin definitions