

Current Sensor

Product Series: SHK-VBS3-S9

SHK-1000VBS3-S9

SHK-1100VBS3-S9

SHK-1200VBS3-S9

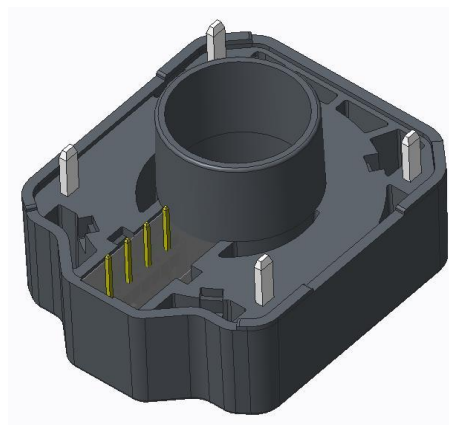
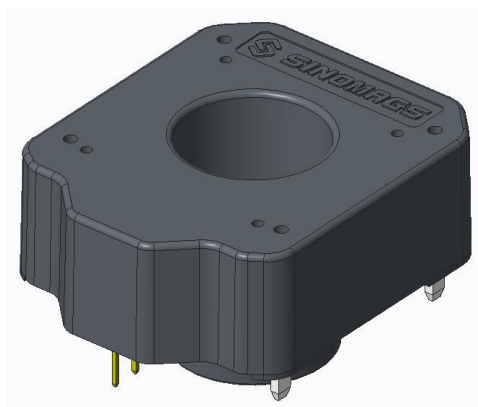
Part number: SHK-1300VBS3-S9

SHK-1400VBS3-S9

SHK-1500VBS3-S9

SHK-1600VBS3-S9

VERSION: Ver 1.0



Sinomags Technology Co., Ltd

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1. Introduction

The SHK-VBS3/S9 series current sensor is based on Hall technology, and it has an 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
- Motor driver

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T _A	°C	-40 ~ 125
Storage temperature	T _{stg}	°C	-40 ~ 125
Mass	m	g	30

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage (not-destructive)	V _{CC}	V	6.5
ESD rating (HBM)	U _{ESD}	kV	2

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	U _d	kV	3.6	
Case material			V0 according to UL 94	
Creepage distance (pri. -sec)	d _{Cp}	mm	11	
Clearance distance (pri. -sec)	d _{Cl}	mm	5	
Comparative tracking index	CTI			PLC3

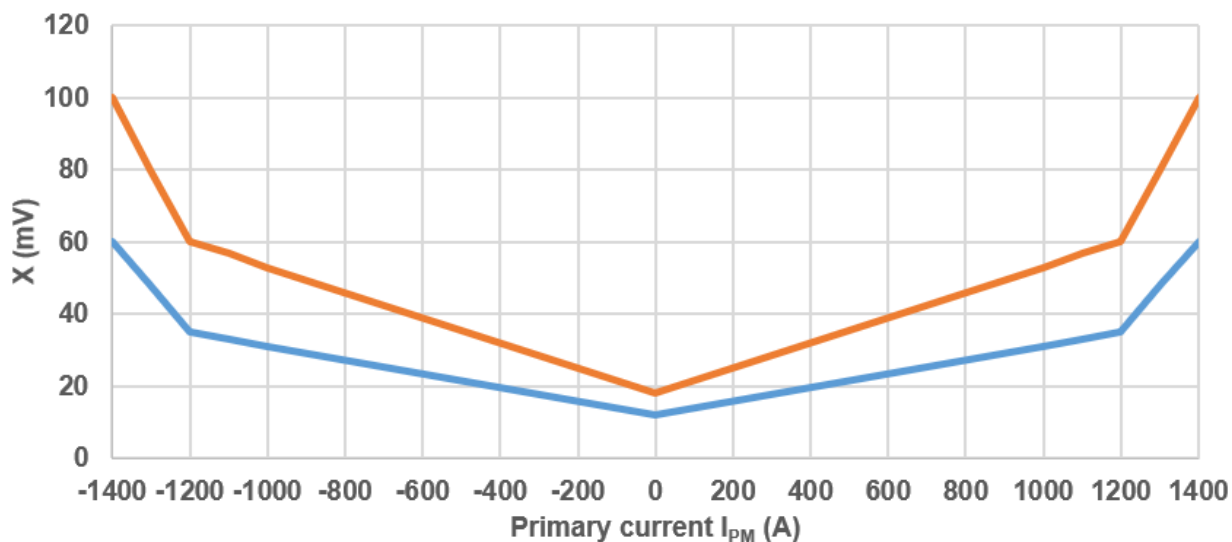
2. Electrical Data

 Condition: $T_A = 25^{\circ}\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Unit	Min	Typ	Max	Comment	Conditions
Primary nominal current	I_{PN}	A		1000		SHK-1000VBS3-S9	
				1100		SHK-1100VBS3-S9	
				1200		SHK-1200VBS3-S9	
				1300		SHK-1300VBS3-S9	
				1400		SHK-1400VBS3-S9	
				1500		SHK-1500VBS3-S9	
				1600		SHK-1600VBS3-S9	
Current range (refer remark)	I_{PM}	A	-1000		1000	SHK-1000VBS3-S9	
			-1100		1100	SHK-1100VBS3-S9	
			-1200		1200	SHK-1200VBS3-S9	
			-1300		1300	SHK-1300VBS3-S9	
			-1400		1400	SHK-1400VBS3-S9	
			-1500		1500	SHK-1500VBS3-S9	
			-1600		1600	SHK-1600VBS3-S9	
Supply voltage	V_{CC}	V		$5 \pm 3\%$		SHK-1000VBS3-S9 SHK-1100VBS3-S9 SHK-1200VBS3-S9 SHK-1300VBS3-S9 SHK-1400VBS3-S9 SHK-1500VBS3-S9 SHK-1600VBS3-S9	
Current consumption	I_{CC}	mA		28	35	All	@ $T_A = 25^{\circ}\text{C}$, @ $U_C = 5\text{V}$
Quiescent voltage V_{out} @ 0 A	V_{off}	V	$V_{CC}/2 - 0.025$	$V_{CC}/2$	$V_{CC}/2 + 0.025$	SHK-1000VBS3-S9 SHK-1100VBS3-S9 SHK-1200VBS3-S9 SHK-1300VBS3-S9 SHK-1400VBS3-S9 SHK-1500VBS3-S9 SHK-1600VBS3-S9	@ U_C
Internal output resistance	R_{out}	Ω		10		V_{out}	

Theoretical gain (Typ)	G _{th}	mV/ A		2		SHK-1000VBS3-S9	@ U _c =5 V
				1.82		SHK-1100VBS3-S9	@ U _c =5 V
				1.67		SHK-1200VBS3-S9	@ U _c =5 V
				1.54		SHK-1300VBS3-S9	@ U _c =5 V
				1.43		SHK-1400VBS3-S9	@ U _c =5 V
				1.33		SHK-1500VBS3-S9	@ U _c =5 V
				1.25		SHK-1600VBS3-S9	@ U _c =5 V
Ratiometricity error	ε _r	%		±0.3			
Average of Sensitivity error	ε _s	%		±0.5			@ T _A = 25 °C @ U _c = 5 V
Average of electrical offset voltage	V _{OE}	mV		±3			@ T _A = 25 °C @ U _c = 5 V
Average of magnetic offset voltage	V _{OM}	mV		±2			@ T _A = 25 °C @ U _c = 5 V
Average temperature coefficient of V _{OE}	TCV _{OEAV}	mV/K	-0.15	±0.05	0.15		@ -40 °C < T < 125 °C @ U _c = 5 V
Average temperature coefficient of S	TCS _{AV}	%/K	-0.03		0.03		@ -40 °C < T < 125 °C @ U _c = 5 V
Average linearity error	ε _L	% I _{PM}		±0.5			Of full range I _{PM}
Step response time	t _{res}	μs		2	4	@90% of I _{PN}	di/dt=100A/μs
Frequency bandwidth (-3dB)	BW	Khz		40		No RC circuit	@ -3dB
Output voltage noise	Vnoise	mVpp		15			DC to 1MHz

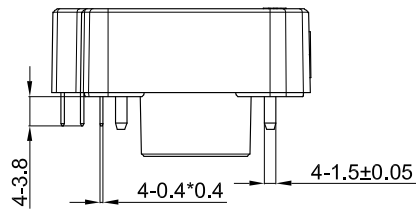
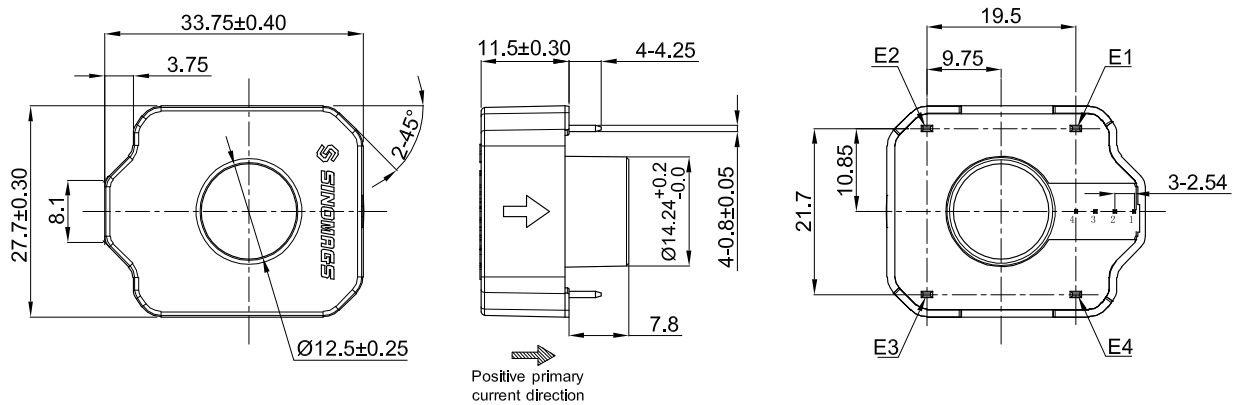
**SHK-VBS3-S9: Overall accuracy X @ Vcc 5V (-40°C ≤ Ta ≤ 125°C)
absolute error**



— Total error @ 25 °C(A) — Total error @ Trange (A)

Overall accuracy X specification(mV)		
$I_{PM}(A)$	@Ta=25°C, VCC=5.0V	@-40°C ≤ Ta ≤ 125°C, VCC=5.0V
-1400	60	100
-1300	48	80
-1200	35	60
-1100	33	57
-1000	31	53
0	12	18
1000	31	53
1100	33	57
1200	35	60
1300	48	80
1400	60	100

3. Dimension & Pin Definitions



Terminals:

1	Vref
2	Out
3	GND
4	+5V

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

