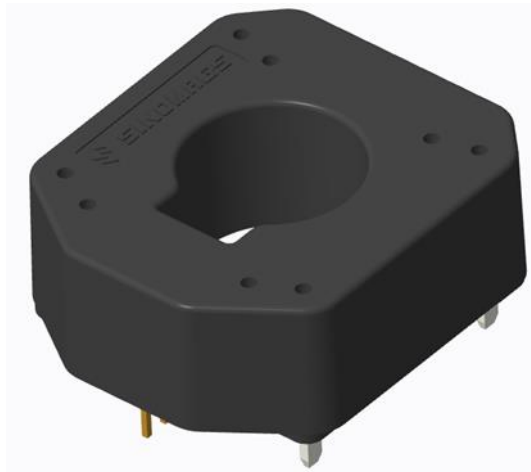


Current Sensor

Product Series: SHK-VBS3

Part number: SHK-VBS3/S2
SHK-VBS3/S4
SHK-VBS3/S5
SHK-VBS3/S6
SHK-VBS3/S7

VERSION: Ver 1.0



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1. Introduction

The SHK-VBS3 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
- Motor driver
- Electric welder power supply

General parameter

Parameter	Symbol	Unit	Value	Comment
Working temperature	T_A	°C	-40 ~ 125	
Storage temperature	T_stg	°C	-40 ~ 125	
Mass	m	g	21	SHK-VBS3/S2
			23	SHK-VBS3/S4
			26	SHK-VBS3/S5
			25	SHK-VBS3/S6
			25	SHK-VBS3/S7

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage (not-destructive)	V _{CC}	V	6
ESD rating (HBM)	U _{ESD}	kV	4

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	Series	Comment
RMS voltage for AC test 50Hz/1 min	U _d	kV	4	ALL	
Clearance distance (pri. -sec)	d _{Cl}	mm	1.7	SHK-VBS3/S2	Shortest distance through air
			3.3	SHK-VBS3/S4	
			5.5	SHK-VBS3/S5	
			5.5	SHK-VBS3/S6	
			5.5	SHK-VBS3/S7	
Creepage distance (pri. -sec)	d _{Cp}	mm	2.55	SHK-VBS3/S2	Shortest path along device body
			3.8	SHK-VBS3/S4	
			8	SHK-VBS3/S5	
			8	SHK-VBS3/S6	
			8	SHK-VBS3/S7	

Case material			V0 according to UL 94	ALL	
Comparative tracking index	CTI	V	600	ALL	

2. Electrical Data

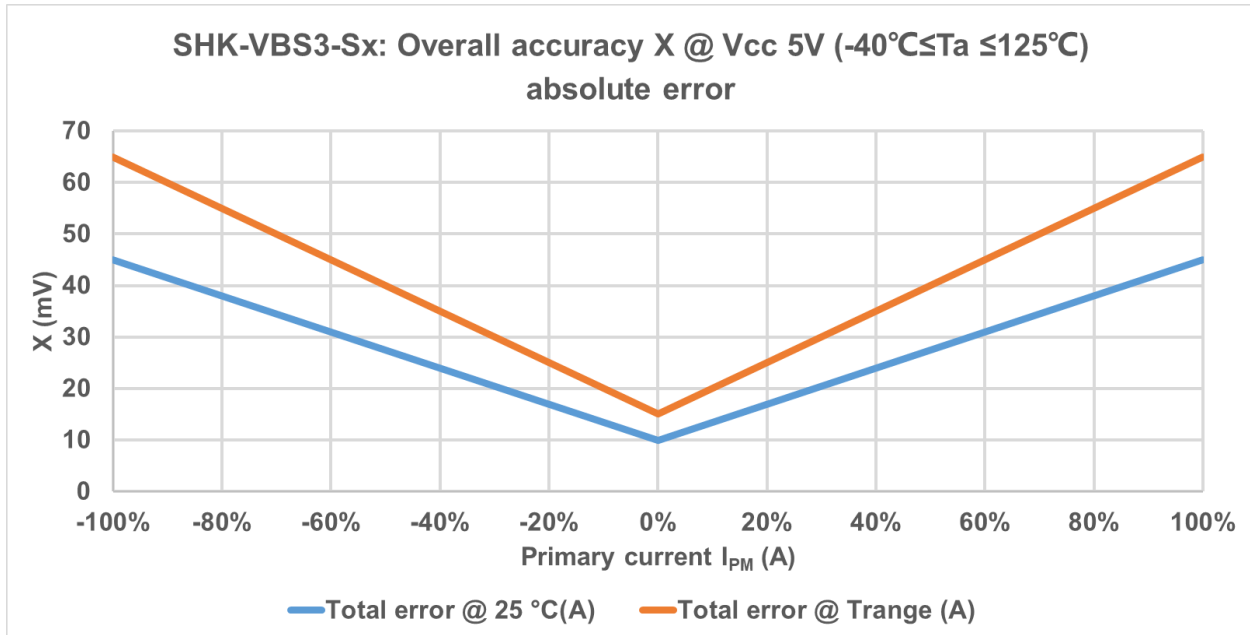
 Condition: $T_A = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Unit	Min	Typ	Max	Comment	Conditions
Primary nominal current	I_{PN}	A		400		SHK-400VBS3/SX	
				500		SHK-500VBS3/SX	
				600		SHK-600VBS3/SX	
				700		SHK-700VBS3/SX	
				800		SHK-800VBS3/SX	
				900		SHK-900VBS3/SX	
Current range (refer remark)	I_{PM}	A	-400		400	SHK-400VBS3/SX	
			-500		500	SHK-500VBS3/SX	
			-600		600	SHK-600VBS3/SX	
			-700		700	SHK-700VBS3/SX	
			-800		800	SHK-800VBS3/SX	
			-900		900	SHK-900VBS3/SX	
Supply voltage	V_{CC}	V		$5 \pm 5\%$		SHK-400VBS3/SX SHK-500VBS3/SX SHK-600VBS3/SX SHK-700VBS3/SX SHK-800VBS3/SX SHK-900VBS3/SX	
Current consumption	I_{CC}	mA		15		All	@ $T_A = 25^\circ\text{C}$, @ $U_C = 5\text{V}$
Quiescent voltage $V_{out} @ 0\text{A}$	V_{off}	V	$V_{CC}/2 - 0.025$	$V_{CC}/2$	$V_{CC}/2 + 0.025$	SHK-400VBS3/SX SHK-500VBS3/SX SHK-600VBS3/SX SHK-700VBS3/SX SHK-800VBS3/SX SHK-900VBS3/SX	@ U_C
Peak output voltage ($V_{out} @ \pm I_{PM}$) - V_{off}	V_{FS}	V		± 2		SHK-400VBS3/SX SHK-500VBS3/SX SHK-600VBS3/SX SHK-700VBS3/SX SHK-800VBS3/SX SHK-900VBS3/SX	@ $T_A = 25^\circ\text{C}$, @ $U_C = 5\text{V}$
Internal output resistance	R_{out}	Ω		5		V_{out}	DC to 1KHz

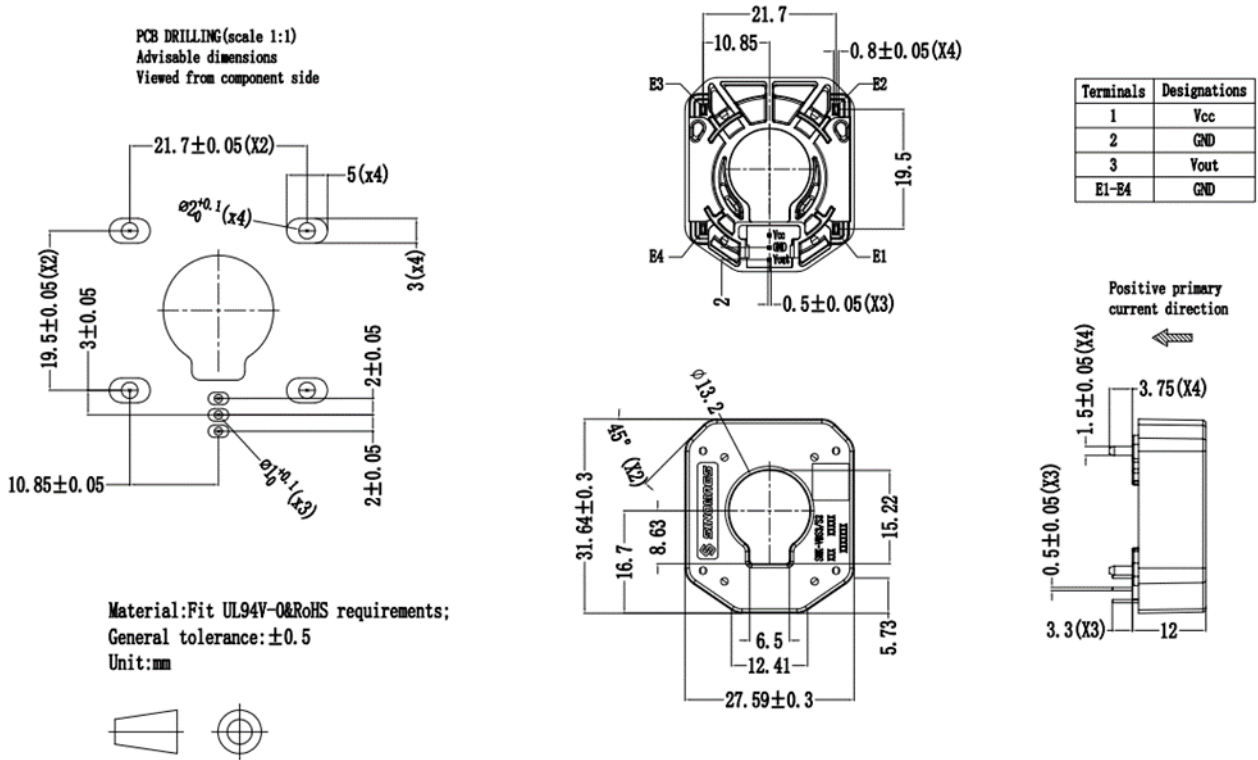
Theoretical gain (Typ)	G _{th}	mV/A		5		SHK-400VBS3/SX	@U _c =5 V
				4		SHK-500VBS3/SX	@U _c =5 V
				3.33		SHK-600VBS3/SX	@U _c =5 V
				2.85		SHK-700VBS3/SX	@U _c =5 V
				2.5		SHK-800VBS3/SX	@U _c =5 V
				2.22		SHK-900VBS3/SX	@U _c =5 V
Rated linearity error	Non-L	% I _{PN}		± 1		±I _{PN}	@T _A =25°C
Step response time	t _{res}	μs		3.5		@90% of I _{PN}	di/dt=100A/μs
Frequency bandwidth (-3dB)	BW	kHz		100		No RC circuit	@ -3dB
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVp/p		10 20		SHK-400VBS3/SX SHK-500VBS3/SX SHK-600VBS3/SX SHK-700VBS3/SX SHK-800VBS3/SX SHK-900VBS3/SX	@14KHz noise filter @140KHz noise filter
Accuracy @ 25°C	X	% of I _{PM}		± 1		All	@U _c =5 V
Accuracy @ -40°C ~ 125°C	X _{TRange}	% of I _{PM}	-3.5		3.5	All	@U _c =5 V

Note:

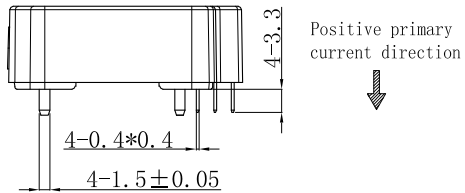
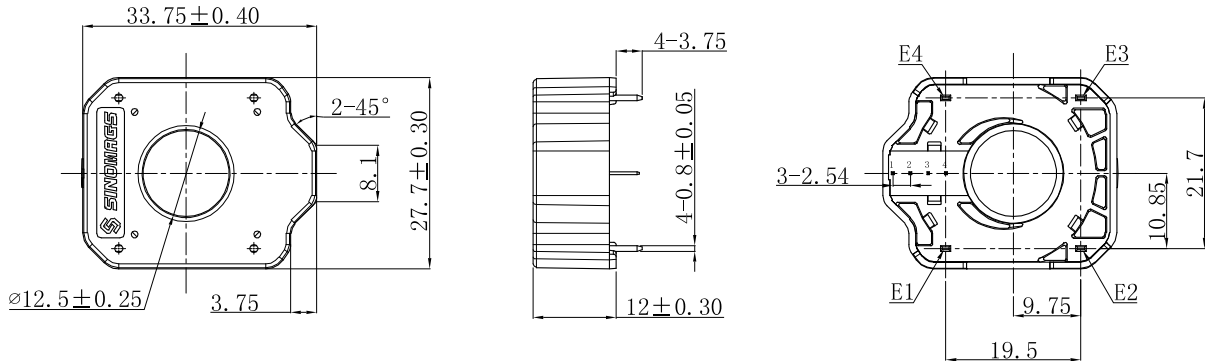
Overall accuracy X specification		
I_{PM}	@ $T_a=25^{\circ}C$, $V_{CC}=5.0V$	@ $-40^{\circ}C \leq T_a \leq 125^{\circ}C$, $V_{CC}=5.0V$
-100%	45mV	65mV
0%	10mV	15mV
100%	45mV	65mV



3. SHK-VBS3/S2 Series Dimension & Pin Definitions



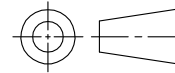
4. SHK-VBS3/S4 Series Dimension & Pin Definitions



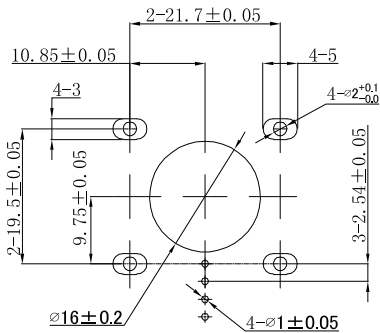
Terminals:

1	NC
2	Out
3	GND
4	+5V

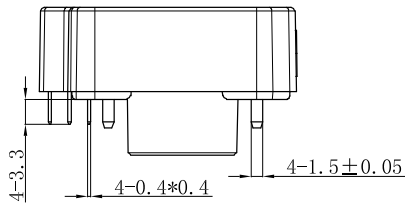
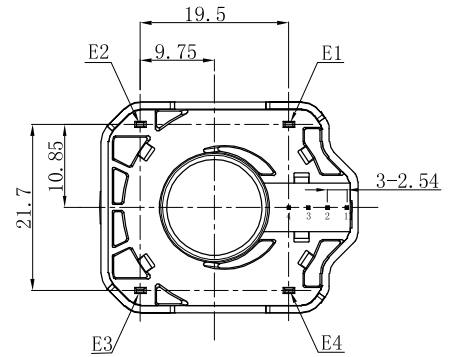
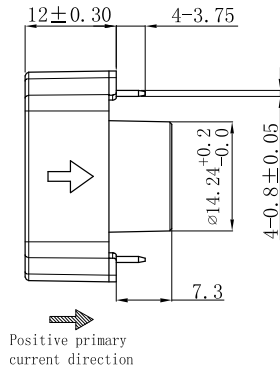
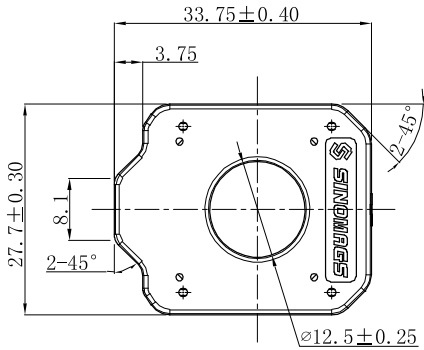
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ± 0.5
Unit : mm



PCB DRILLING (scale 1:1)
Advisable dimensions viewed from component side



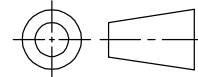
5. SHK-VBS3/S5 Series Dimension & Pin Definitions



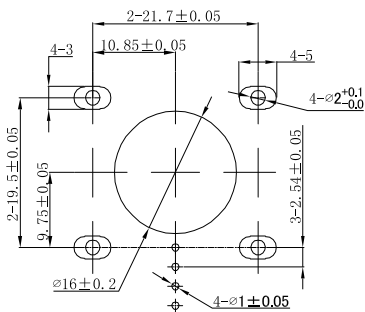
Terminals:

1	NC
2	Out
3	GND
4	+5V

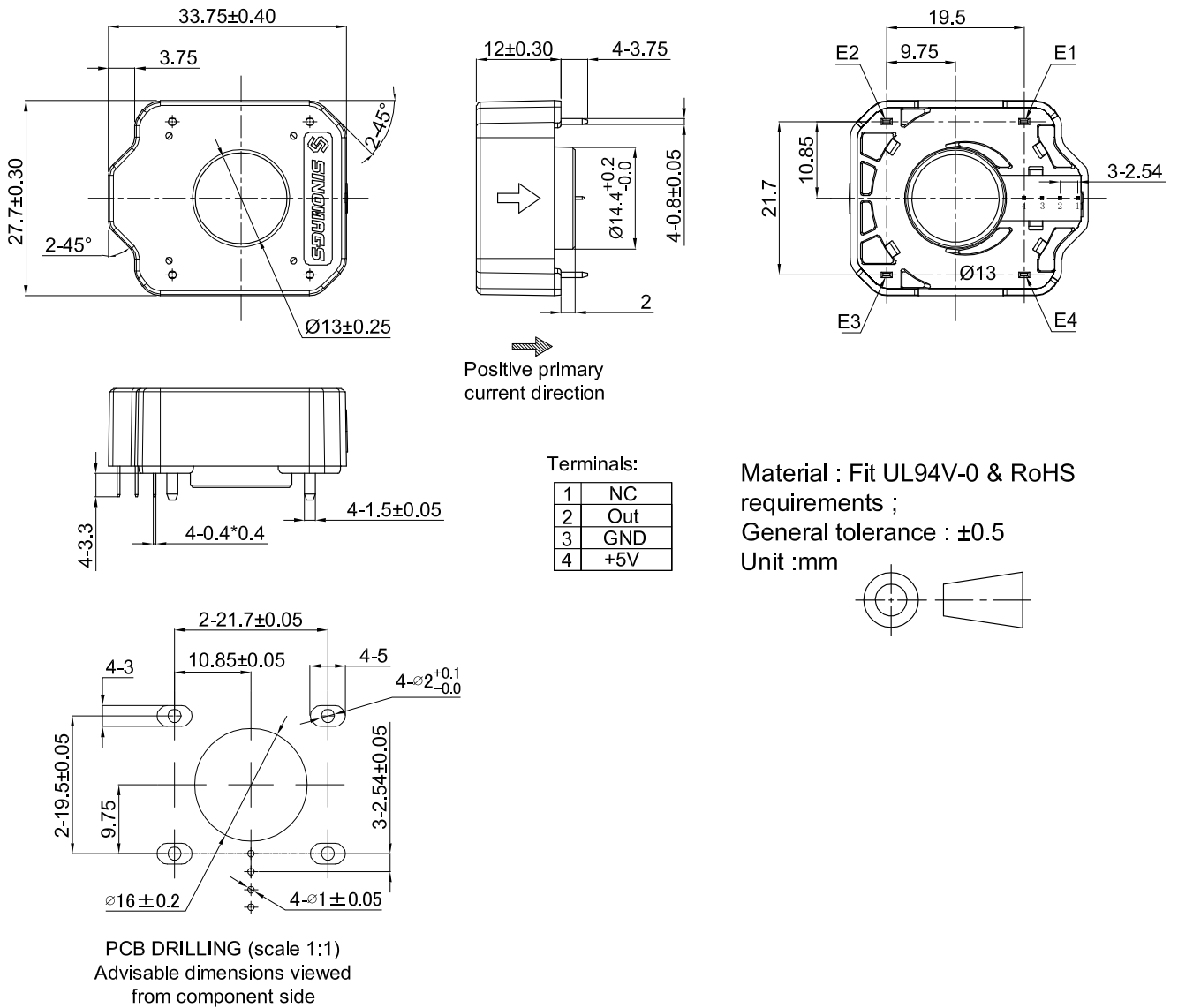
Material : Fit UL94V-0 & RoHS requirements ;
 General tolerance : ±0.5
 Unit :mm



PCB DRILLING (scale 1:1)
 Advisable dimensions viewed from component side



6. SHK-VBS3/S6 Series Dimension & Pin Definitions



7. SHK-VBS3/S7 Series Dimension & Pin Definitions

