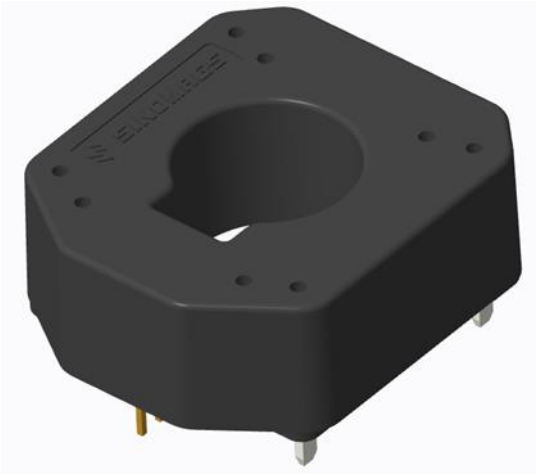
SINOMAGS 希 磁 科 技

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 1.1



Sinomags Technology Co., Ltd

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CONTENT

1. Introduction 2
2. Electrical Data 4
3. SHK-VBS3/S2 Series Dimension & Pin Definitions 7
4. SHK-VBS3/S4 Series Dimension & Pin Definitions 8
5. SHK-VBS3/S5 Series Dimension & Pin Definitions 9
6. SHK-VBS3/S6 Series Dimension & Pin Definitions 10
7. SHK-VBS3/S7 Series Dimension & Pin Definitions 11

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
- Electric welder power supply
- Motor driver

General parameter

Parameter	Symbol	Unit	Value	Comment
Working temperature	T_A	℃	-40 ~ 125	
Storage temperature	T_stg	℃	-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	Ud	kV	4	ALL	
Clearance distance (pri. -sec)	dCl	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)	dCp	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	ALL	

			to UL 94		
Comparative traking index	CTI	V	600	ALL	

2. Electrical Data

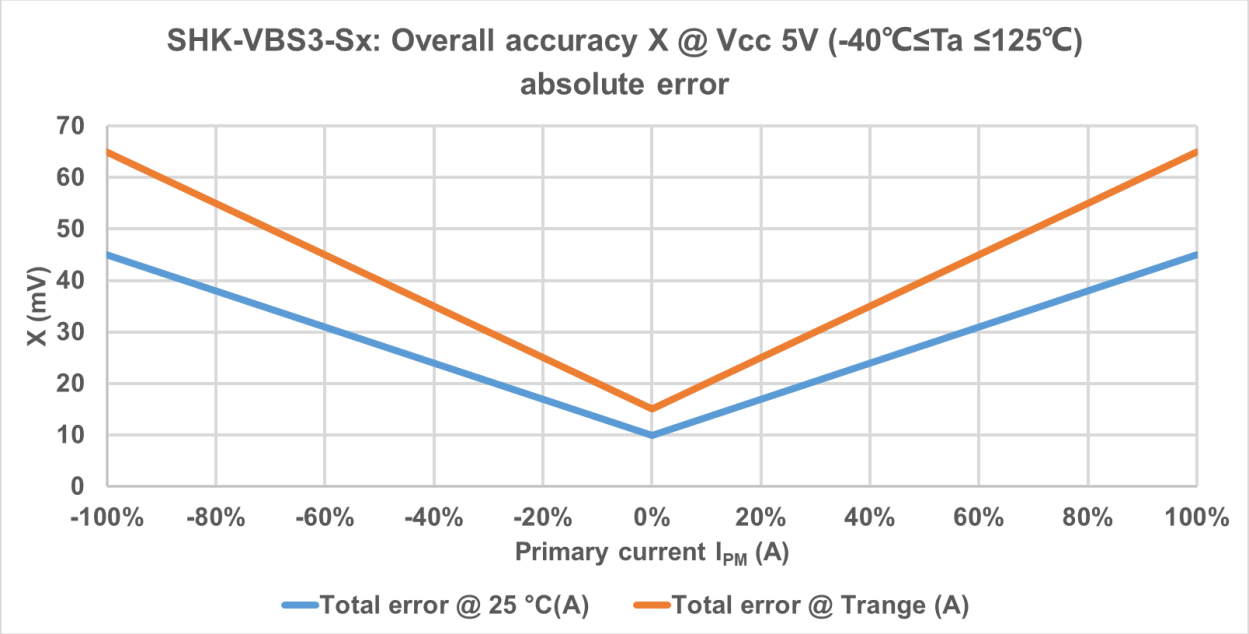
Condition：T_A = 25℃，Vcc = 5V

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	Vcc	V		5 ± 5%		SHK-400VBS3/SX SHK-500VBS3/SX SHK-600VBS3/SX SHK-700VBS3/SX SHK-800VBS3/SX SHK-900VBS3/SX	
Current consumption	Icc	mA		15		All	@T_A=25℃, @U_C=5 V
Quiescent voltage Vout @ 0 A	Voff	V	Vcc/2-0.025	Vcc/2	Vcc/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 (Vout @ ±I_{PM}) – Voff	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℃, @U_C=5 V
Internal output resistance	R_out	Ω		5		Vout	DC to 1KHz

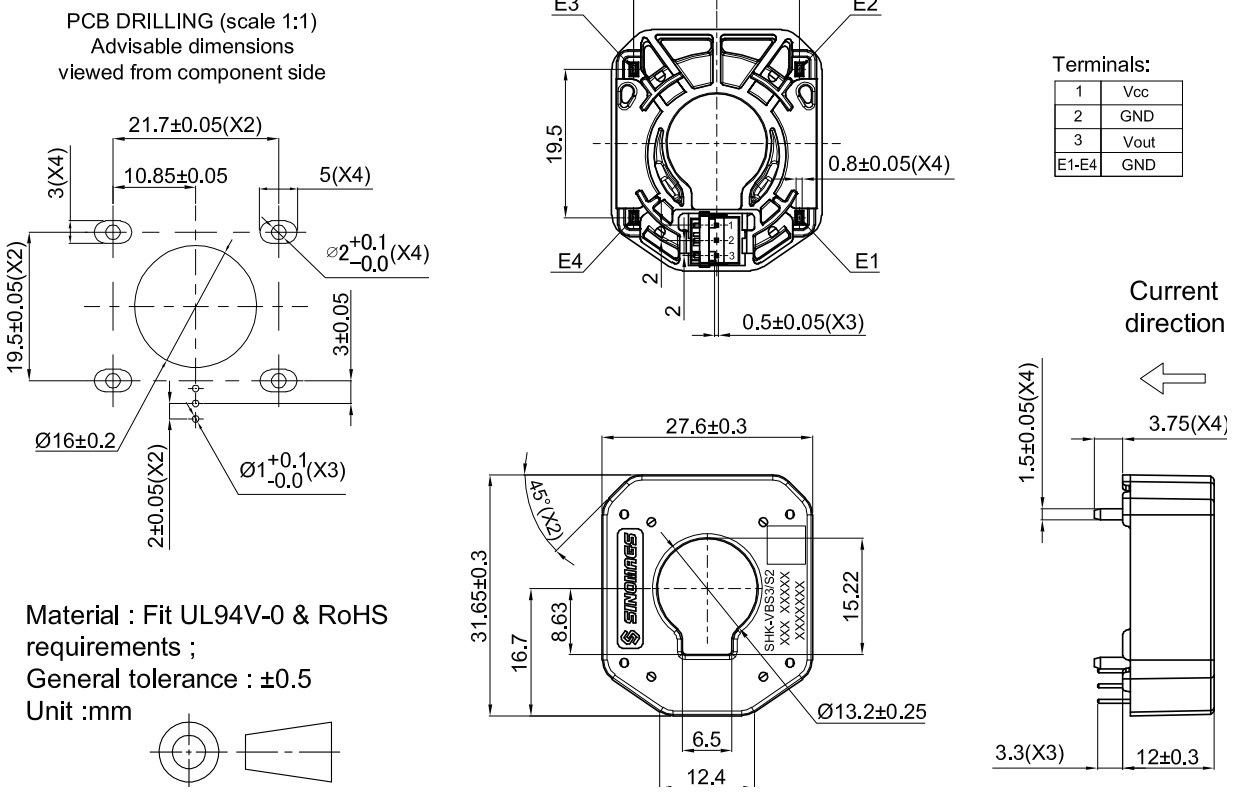
Theoretical gain (Typ)	G_th	mV/A		5		SHK-400VBS3/SX	@U_C=5 V
				4		SHK-500VBS3/SX	@U_C=5 V
				3.33		SHK-600VBS3/SX	@U_C=5 V
				2.85		SHK-700VBS3/SX	@U_C=5 V
				2.5		SHK-800VBS3/SX	@U_C=5 V
				2.22		SHK-900VBS3/SX	@U_C=5 V
Rated linearity error	Non-L	% I_{PN}		± 1		±I_{PN}	@T_A=25℃
Step response 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	mVpp		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℃	X	% of I_{PM}		±1		All	@U_C=5 V
Accuracy @ -40℃ ~ 125℃	X_TRange	% of I_{PM}	-3.5		3.5	All	@U_C=5 V
Output Load Resistance	R_L	KΩ	10			All	
Output Load Capacitor	C_L	nF			2.2	All	

Note：

Overall accuracy X specification		
I_{PM}	@Ta=25℃， VCC=5.0V	@-40℃≤Ta≤125℃， VCC=5.0V
-100%	45mV	65mV
0%	10mV	15mV
100%	45mV	65mV

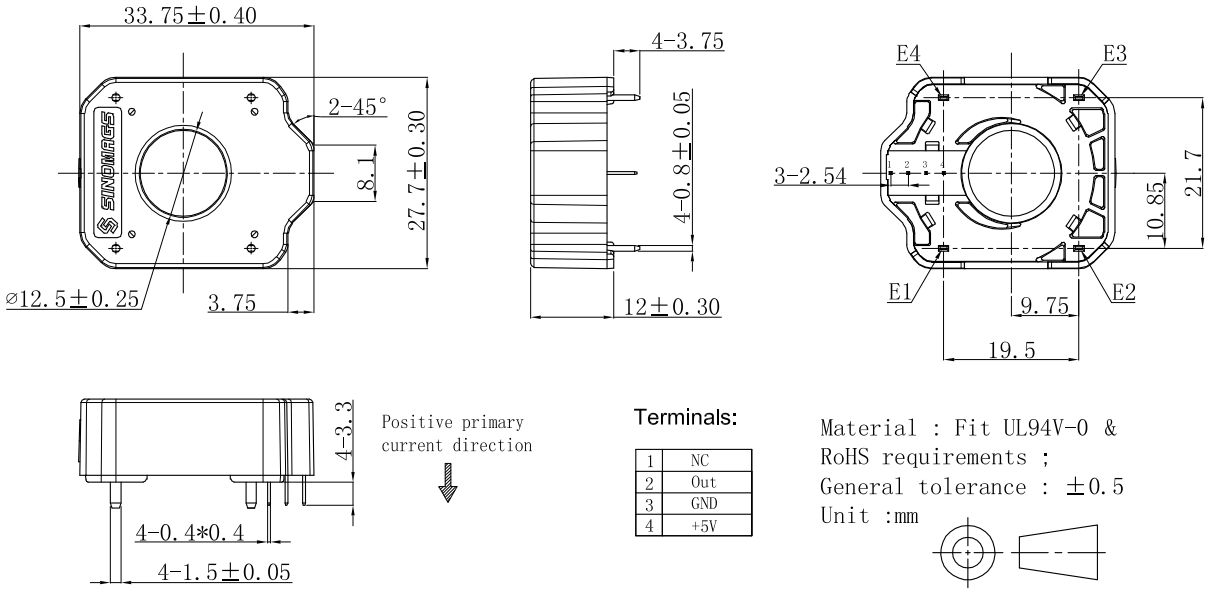


3. SHK-VBS3/S2 Series Dimension & Pin Definitions



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

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

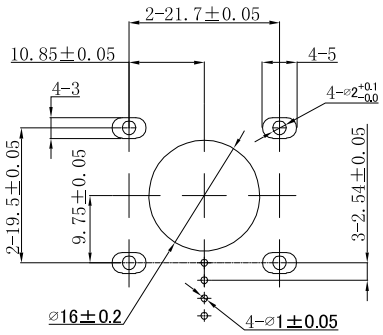


Terminals:

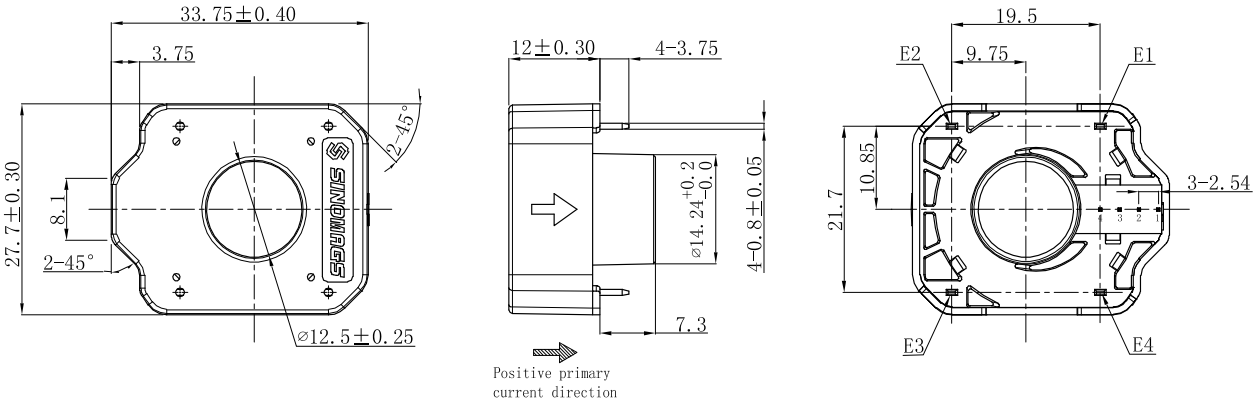
1	NC
2	Out
3	GND
4	+5V

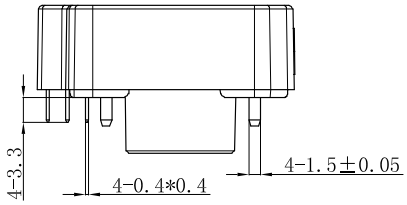
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm

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



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

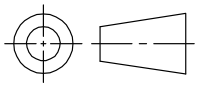




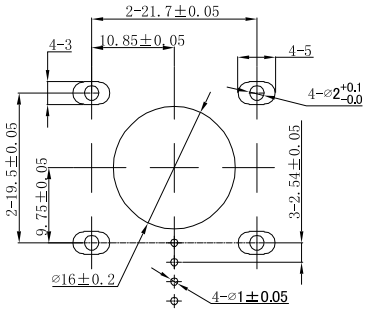
Terminals:

1	NC
2	Out
3	GND
4	+5V

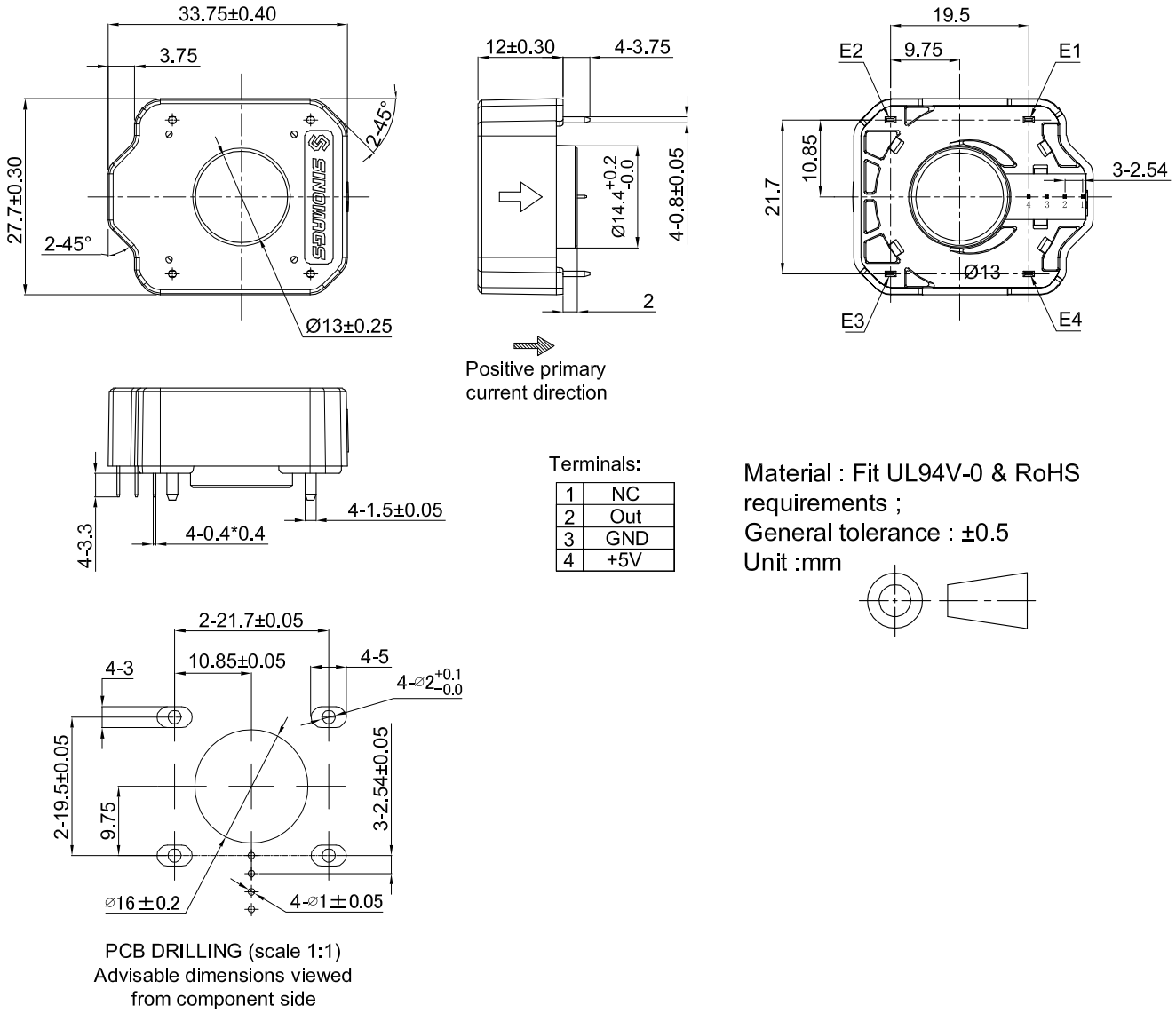
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm



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



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



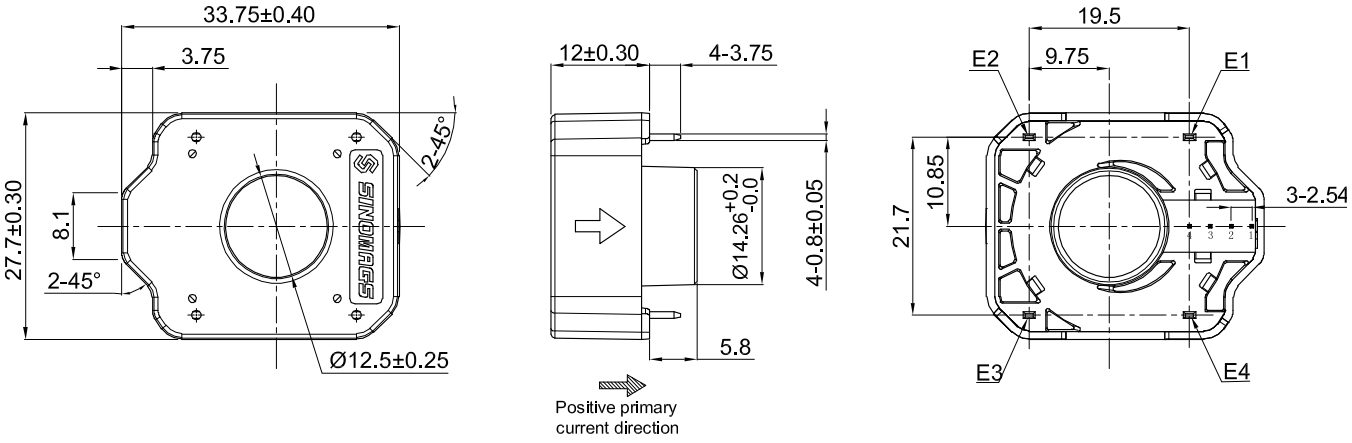
Terminals:

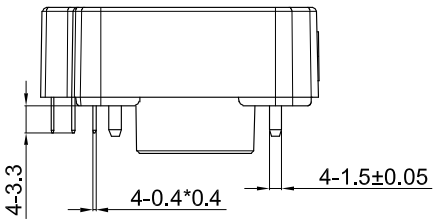
1	NC
2	Out
3	GND
4	+5V

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

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

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

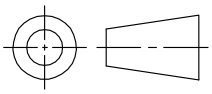


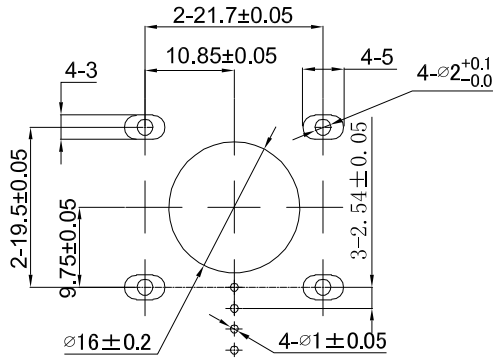


Terminals:

1	Vref
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