Current Sensor

Product Series： SHK-VBS2

Part number： SHK-545VBS2/D

Version： Ver 1.1

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CONTENT

1. Description

SHK-VBS2 series current sensor is a new generation of current sensor based on the open-loop principle, which can measure DC, AC, pulse and various irregular waveforms of current under isolated conditions.

Typical applications

- AC Variable speed drives
- DC motor
- UPS power supply
- Communication power source
- Inverter

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	℃	-40 ~ 125
Storage temperature	T_stg	℃	-40 ~ 125
Mass	m	g	60

Absolute maximum ratin

Parameter	Symbol	Unit	Value
Supply voltage	V_C	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

Paramete	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	4	
Shell material			V0 according to UL 94	

2. Electrical data

Condition：T_A = 25℃，Vcc = 5 V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_pn	A		545		
Primary current measuring range	I_pm	A	-1090		1090	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		10	15	
Rated output voltage	V_FS	V		±1		(Vout @ ±I_pn) – Voff
Internal output resistance	R_out	Ω		5		Vout
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Quiescent voltage Vout @ 0 A	Vref	V	2.48	2.5	2.52	
Electrical offset voltage (Vout – Vref) @ 0 A	Voe	V	-20		20	
Theoretical gain	G_th	mV/A		1.83		1 V @ I_pn
Rated linearity error	Non-L	%I_pn	-1.5		1.5	±I_pn
Overload linearity error	Non-L	%I_pm	-1.5		1.5	±I_pm
Step response time	t_res	μs		3.5		@90% of I_{PN}
-3dB band width	BW	kHz		NC		Back-end non-RC circuit
Noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		 20 38		
Accuracy @ RT	X	% of I_pn	-1.5		1.5	@25℃
Accuracy	X_TRange	%ofI_pn	-3		3	-40℃~105℃

Remarks：

1. the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature.

3. Step response time

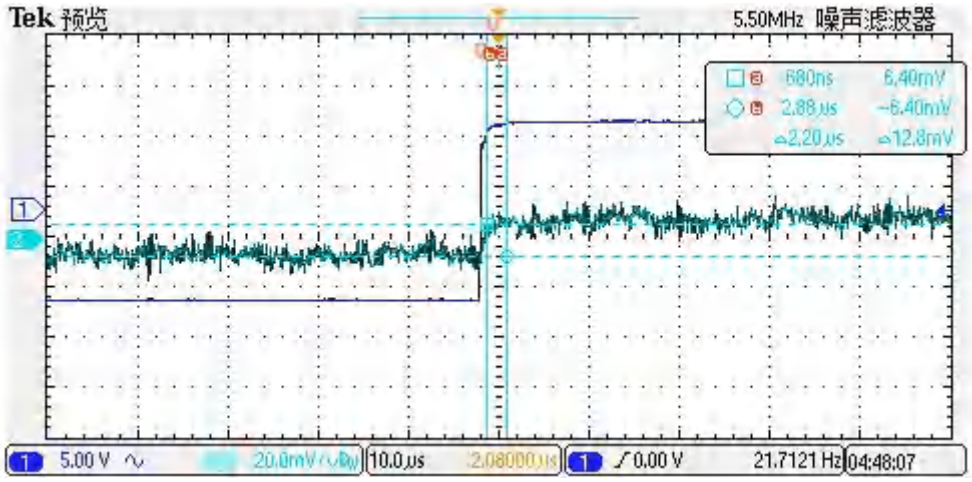
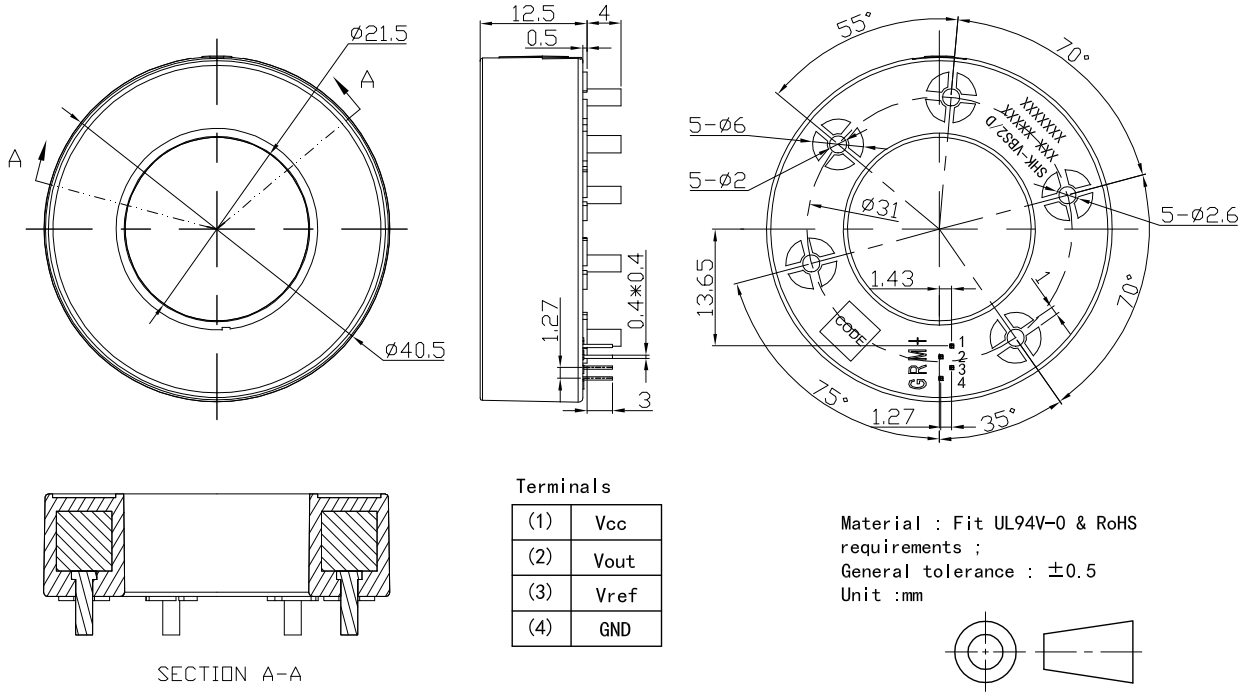


Fig.1the step response time of SHK-VBS2 current sensors. The light blue is primary current, while the dark blue is output signal of current sensor. The step response time is less than 3.5µs.

4. Dimensions & Pins & Footprint



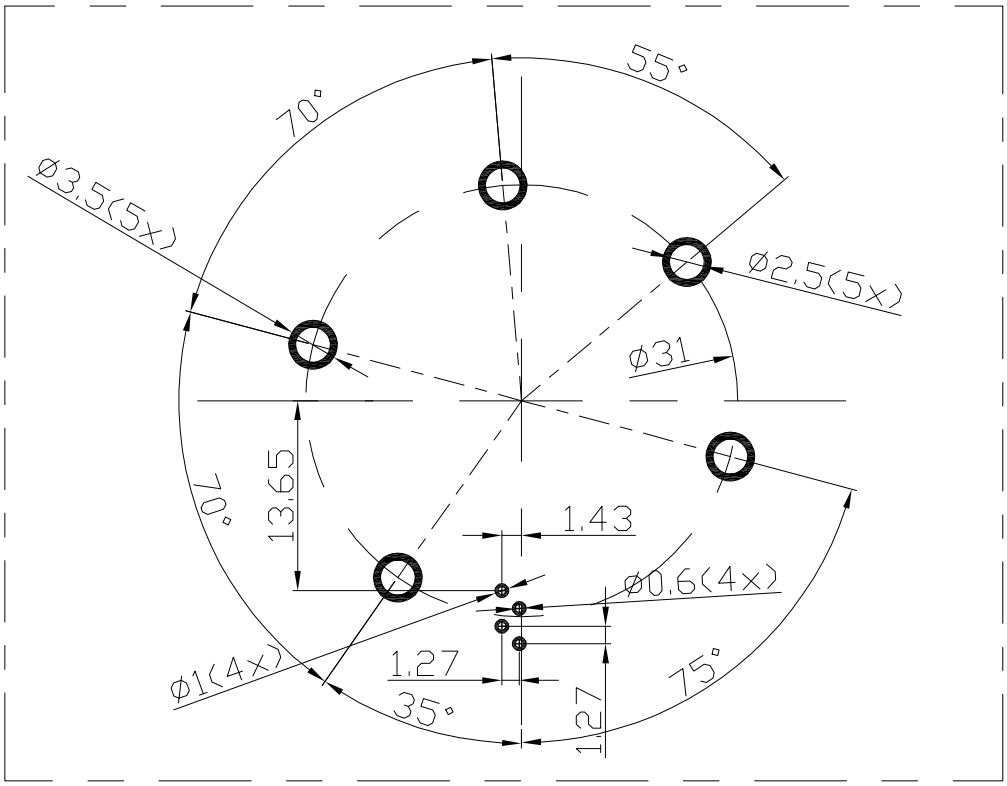
Terminals

(1)	Vcc
(2)	Vout
(3)	Vref
(4)	GND

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

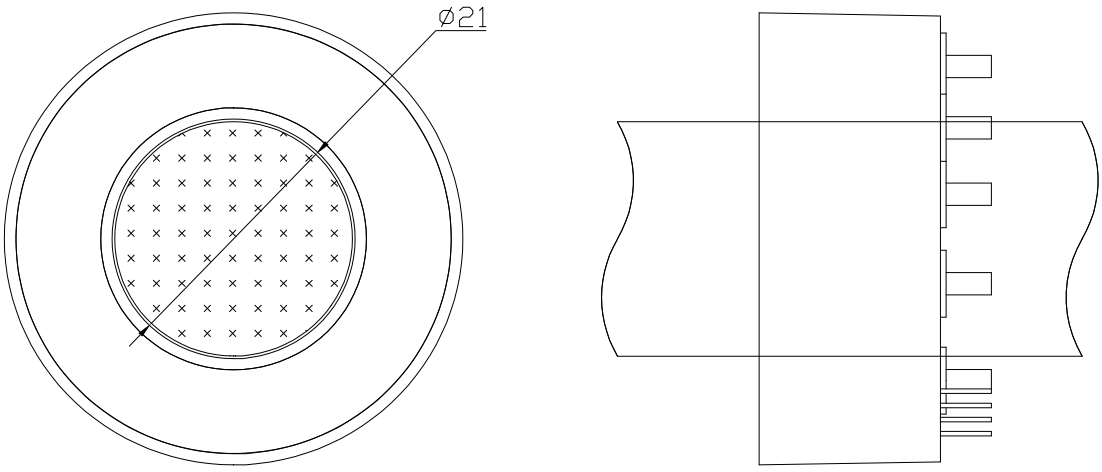
5. Install it on the PCB

Installation Angle: overlooking (view from the side where the sensor is installed, unit: mm)

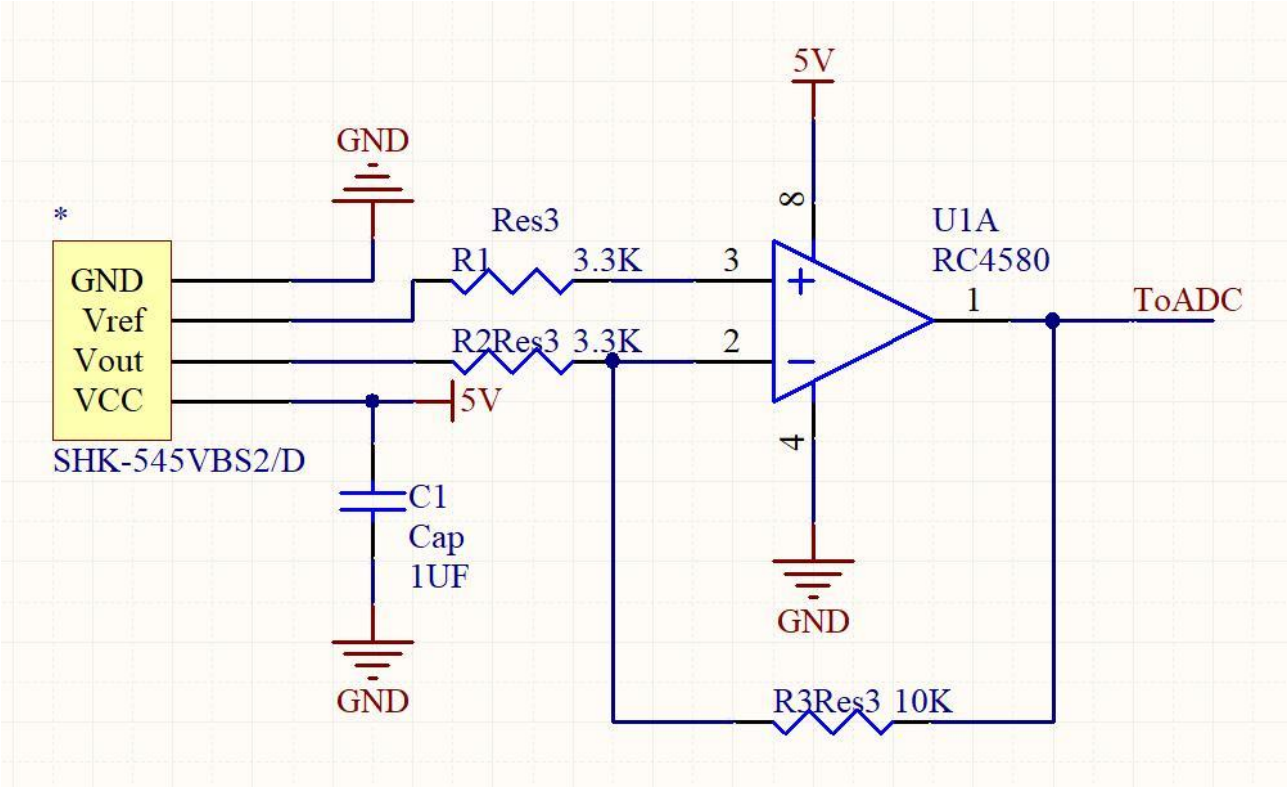


6. Product repair and test schematic

Product testing: The product is tested by passing a 21mm diameter copper rod through the sensor as the primary current line, as shown in the shaded position.



Appendix: Recommended applications of sensors



1. Supply voltage

Supply voltage Uc：5V±5%

The reference voltage：2.5V±0.02V

Note: This version is the non-follow up version, and the output is independent of the supply voltage.