Current Sensor

Product Series: SHK-VBS-T

Part number: SHK-VBS-T9-900-S2
SHK-VBS-T9-1000-S2

Version: Ver 1.8

Sinomags Technology Co., Ltd

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CONTENT

1. Description

The SHK-VBS-T9 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

- Electrical Power Steering
- Motor drive application
- Converters
- Battery Management

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_a	℃	-40 ~ 125
Storage temperature	T_{stg}	℃	-40 ~ 125
Mass	m	g	80

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	V	-0.3 ~ 10 (Not operating)
			6.5
Electrostatic discharge voltage	U_{ESD}	kV	8 (HBM)

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_{is}	MΩ	500	DC 1kV/1 min
Clearance distance (pri. -sec)	d_{Cl}	mm	8.4	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	8.4	Shortest path along device body
Case material			V0 according to UL 94	

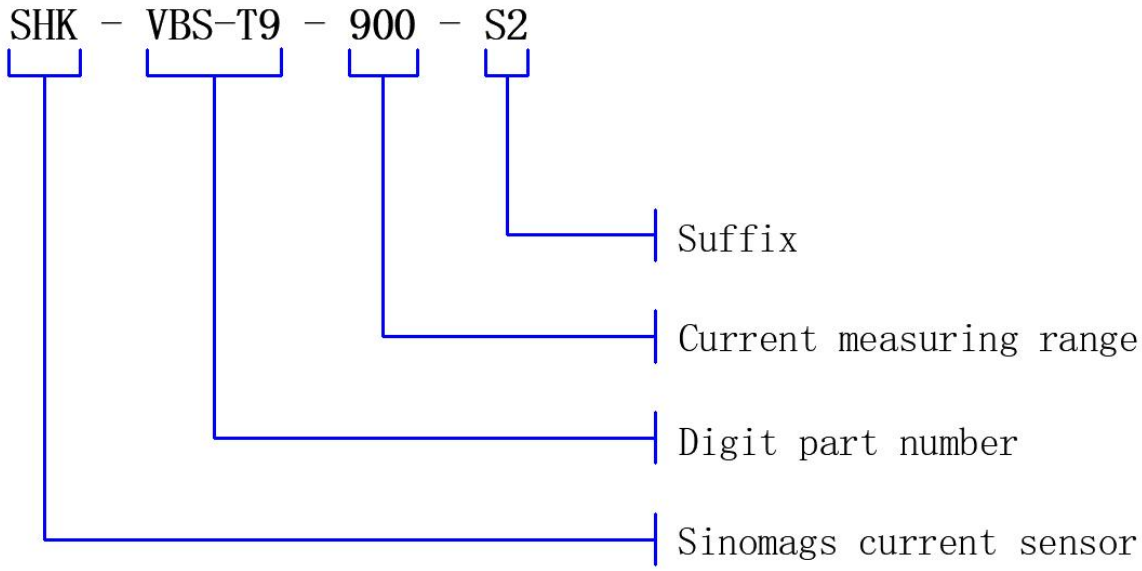
Selection Guide

Product	**Nominal current**	**Measuring range**
SHK-VBS-T9-900-S2	900 A	900 A
SHK-VBS-T9-1000-S2	1000A	1000A

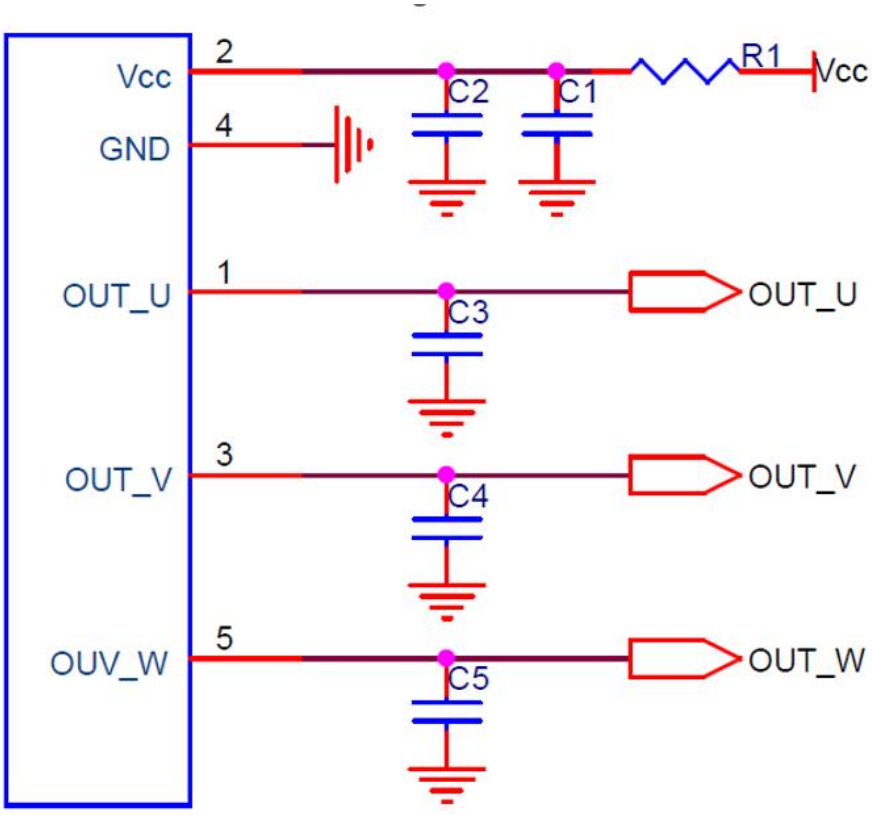
2. Electrical data

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-900		900	SHK-VBS-T9-900-S2
			-1000		1000	SHK-VBS-T9-1000-S2
Supply voltage	V_{CC}	V	4.75	5	5.25	
Current consumption	I_{CC}	mA		45	60	@ V_{CC}= 5.0 V
Output voltage	V_{OUT}	V	(V_{CC}/5)×(V_{off}+G×I_{PM})			@ T_a = 25℃
Quiescent voltage	V_{off}	V		2.5		@ T_a = 25℃, V_{CC} = 5.0 V
Sensitivity	G	mV/A		2.22		SHK-VBS-T9-900-S2 @ T_a = 25℃, V_{CC} = 5.0 V
				2.00		SHK-VBS-T9-1000-S2 @ T_a = 25℃, V_{CC} = 5.0 V
Load resistance	R_L	kΩ	10		100	
Ratiometricity error	ε_r	%		±0.5		@ 4.75V ≤ V_{CC} ≤ 5.25V
Sensitivity error	ε_G	%		±0.6		@ T_a = 25℃, V_{CC} = 5.0 V
Electrical offset voltage error	V_{OE}	mV	-13	±4.0	13	@ T_a = 25℃, V_{CC} = 5.0 V
Magnetic offset voltage error	V_{OM}	mV		±5.0		@ T_a = 25℃, V_{CC} = 5.0 V, after ±I_{PM}
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/℃		±0.05		@ -40℃≤T_a ≤125℃
Ave. Temp. coefficient of G	TCG_{AV}	%/℃		±0.03		@ -40℃≤T_a ≤125℃
Linearity	ε_L	%	-1	±0.5	1	@ T_a = 25℃, V_{CC} = 5.0 V, I = I_{PM}
Response time	T_r	μs		2	6	@ 90% of I_{PM}
Frequency bandwidth (-3 dB)	BW	kHz	40			No RC circuit
Output voltage noise	V_{no}	mVpp		20		@ DC ~ 10 kHz
Power on delay	T_{POD}	ms			1	

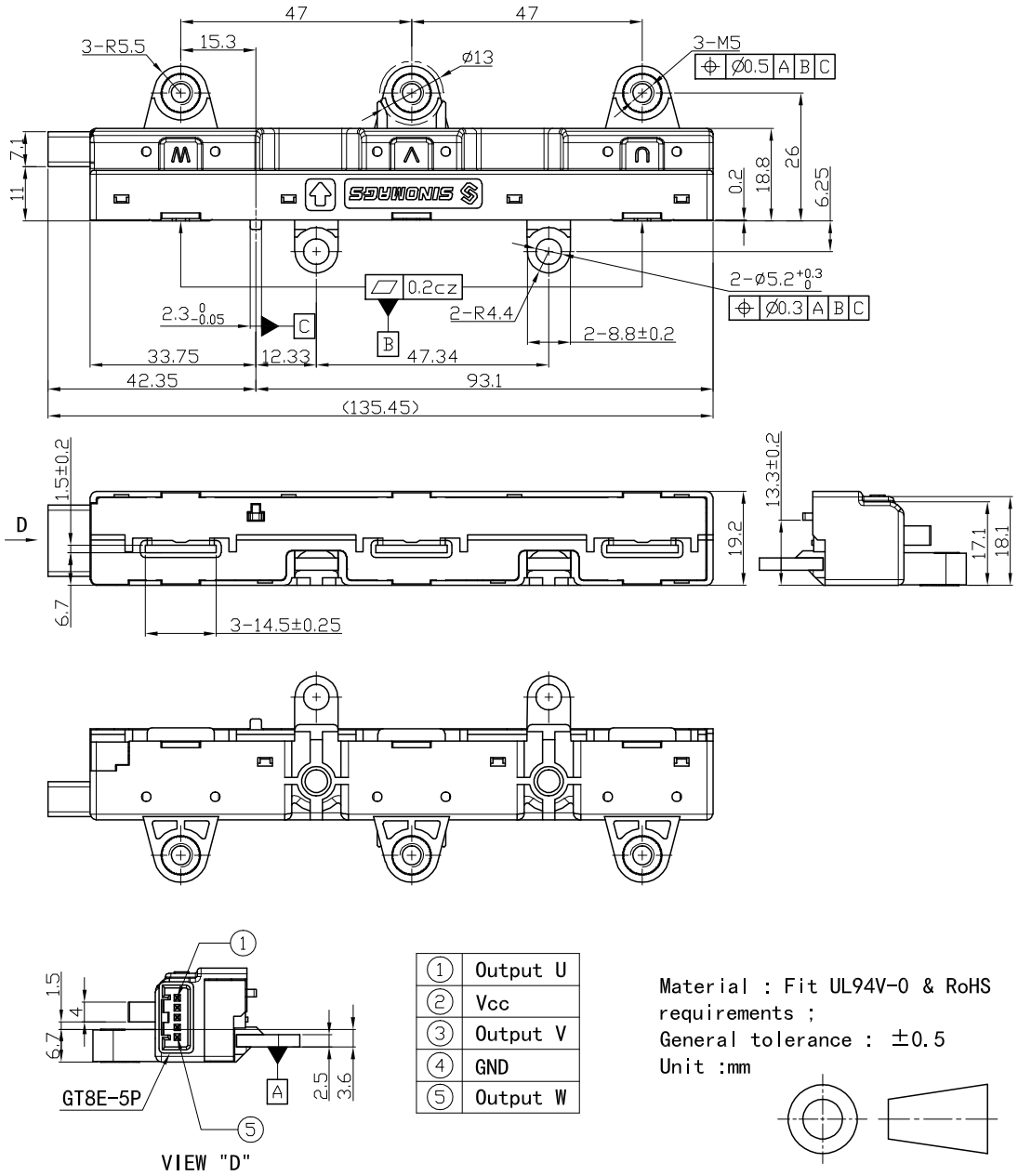
3. Product definition statement



4. Electrical circuit diagram

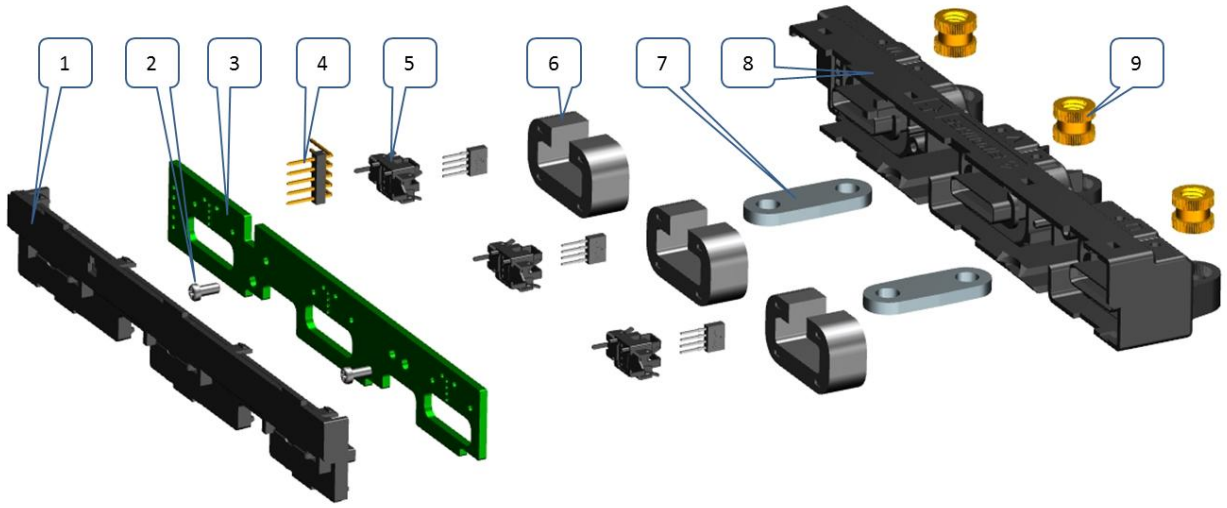


5. Dimension & Pin definitions



6. Material of components

No.	Name	Model material
1	Back cover	PPS/Z-650-B2
2	Self tapping screw	M2*5 carbon steel galvanized
3	PCB substrate	FR4/R1755E
4	Pin	Plastic: PA66+30%GF, Square needle: H65 brass, nickel base, gold plated surface
5	Hall support	PPS/Z-650-B2
6	Magnetic core	23ZH90 silicon steel
7	Fixed plate	A5052
8	Shell	PPS/Z-650-B2
9	Nut	H59 brass



7. Environmental test

Name	Test condition
Environmental tests, electrical tests	
Humidity test	85℃/85%,1000hr
Thermal shock	-40℃/125℃, 1000cycles
High temperature test	125℃, 1000hr
Low temperature test	-40℃, 1000hr
Insulation voltage	2.5kV, 50Hz, 1min
Insulation resistance	DC500V, 1min

Mechanical tests	
Shocks	ISO16750-3
Vibration test	ISO16750-3
EMC tests	
Electrostatic discharges	ISO10605(07/2008)
Bulk current injection	ISO11452-4(12/2011)
Immunity to Radiated disturbances	ISO11452-2(11/2004), ALSE
Emission radiated	CISPR25(03/2008), ALSE
Immunity power line magnetic fields	ISO11452-8(06/2015)

8. Important notice

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