

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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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
- Converters
- Motor drive application
- Battery Management

General parameter

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

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	V_{cc}	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	

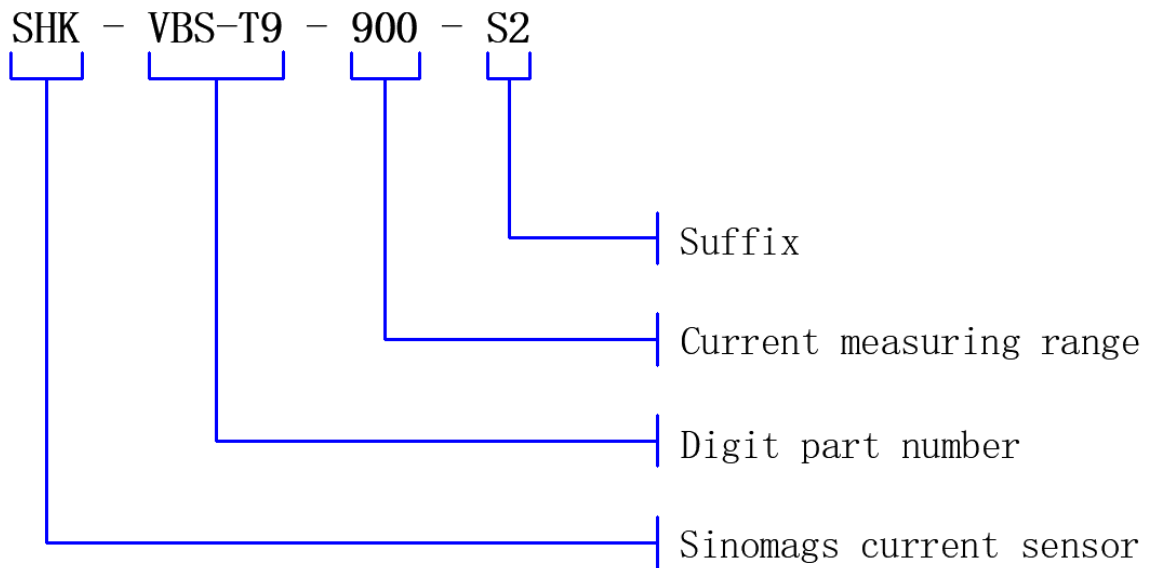
Selection Guide

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

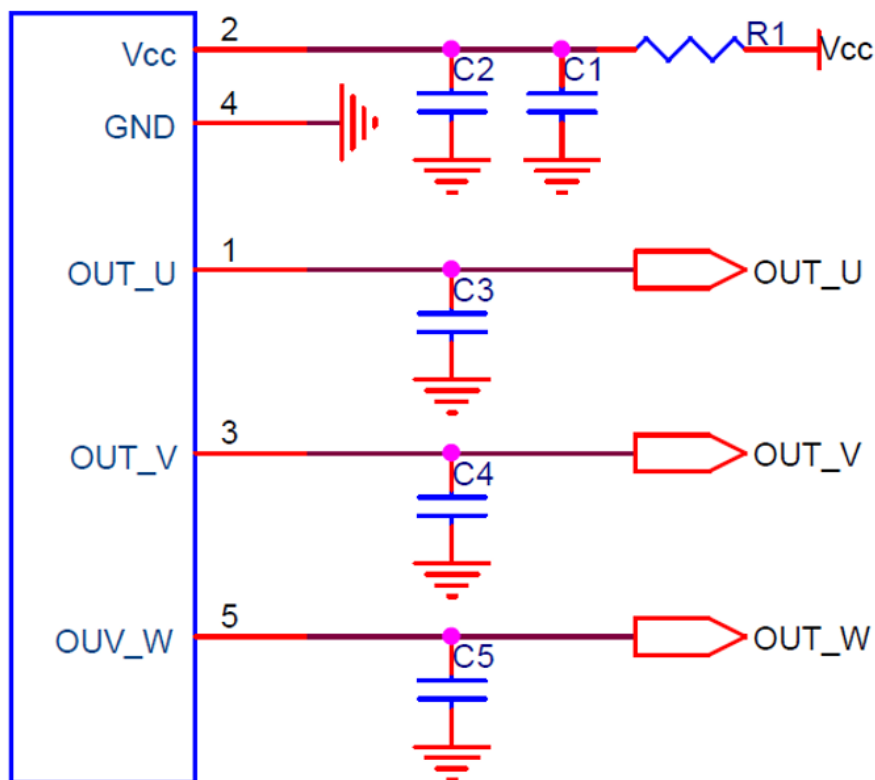
2. Electrical data

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	@ $V_{CC} = 5.0\text{ V}$
Output voltage	V_{OUT}	V	$(V_{CC}/5) \times (V_{off} + G \times I_{PM})$			@ $T_a = 25^\circ\text{C}$
Quiescent voltage	V_{off}	V		2.5		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Sensitivity	G	mV/A		2.22		SHK-VBS-T9-900-S2 @ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
				2.00		SHK-VBS-T9-1000-S2 @ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Load resistance	R_L	k Ω	10		100	
Ratiometricity error	ϵ_r	%		± 0.5		@ $4.75\text{ V} \leq V_{CC} \leq 5.25\text{ V}$
Sensitivity error	ϵ_G	%		± 0.6		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Electrical offset voltage error	V_{OE}	mV	-13	± 4.0	13	@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Magnetic offset voltage error	V_{OM}	mV		± 5.0		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, after $\pm I_{PM}$
Ave. Temp. coefficient of V_{OE}	TCV_{OEAV}	mV/ $^\circ\text{C}$		± 0.05		@ $-40^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$
Ave. Temp. coefficient of G	TCG_{AV}	%/ $^\circ\text{C}$		± 0.03		@ $-40^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$
Linearity	ϵ_L	%	-1	± 0.5	1	@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, $I = I_{PM}$
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	

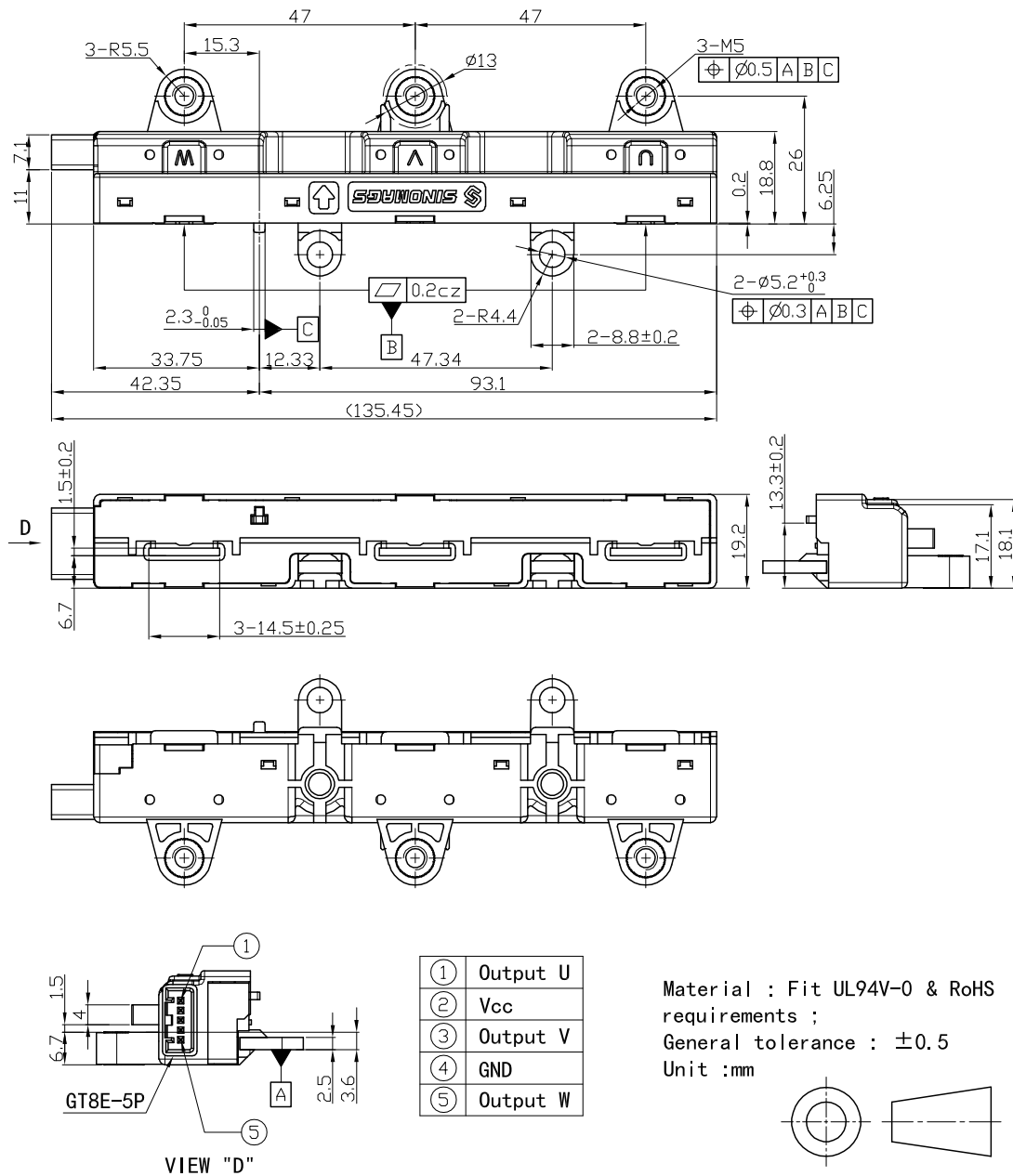
3. Product definition statement



4. Electrical circuit diagram

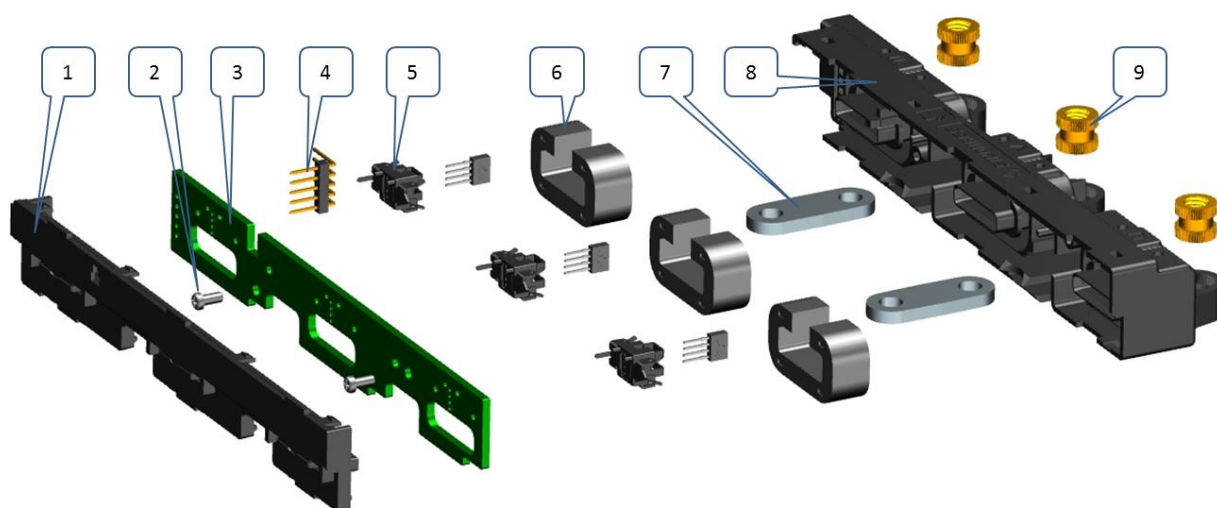


5. Dimension & Pin definitions



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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Revision History

Number	Description	Responsible	Date
V1.0	Release	Junjie Shen	2022-02-07
V1.1	Add parameters	XXP	2022-03-03
V1.2	Add parameters	XXP	2022-03-07
V1.3	Product name changed	Kan.Tan	2022-03-08
V1.4	Size changed	Kan.Tan	2022-03-10
V1.5	Size changed	Kan.Tan	2022-03-11
V1.6	Name changed	Kan.Tan	2022-03-11
V1.7	Product mass changed	Kan.Tan	2022-03-15
V1.8	添加 1000A 规格	Kan.Tan	2022-06-09