

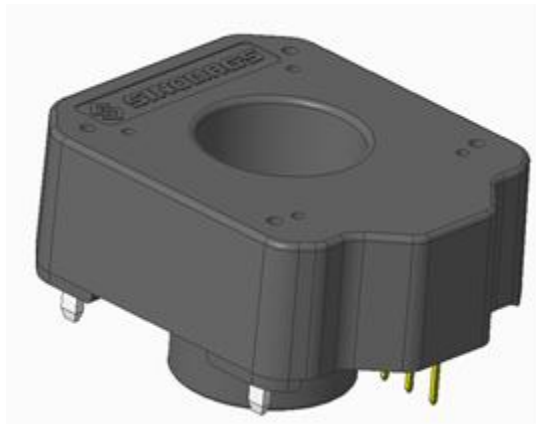
Current Sensor

Product Series: SHK-VBS3/S5

SHK-400VBS3/S5 & SHK-500VBS3/S5 &
SHK-600VBS3/S5 & SHK-700VBS3/S5 &

Part number: SHK-800VBS3/S5 & SHK-900VBS3/S5

VERSION: Ver 1.1



Sinomags Technology Co., Ltd

Web site: www.sinomags.com

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1. Introduction

The SHK-VBS3/S5 series current sensor is based on Hall technology, and it has an open-loop design. It is suitable for DC, AC or pulsed currents in high power and low voltage automotive applications with galvanic separation between the primary circuit (high power) and the secondary circuit (electronic circuit). The magnetic chip was qualified according to the AEC-Q100.

Automotive applications

- AC Variable speed drivers
- EV MCU (motor control unit)
- Starter Generators
- Electric welder power supply
- Electrical Power Steering
- Converters

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T _A	°C	-40 ~ 125
Storage temperature	T _{stg}	°C	-40 ~ 125
Mass	m	g	22

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	Comment
RMS voltage for AC test 50Hz/1 min	U _d	kV	4	
Clearance distance (pri. -sec)	d _{Cl}	mm	5.5	Shortest distance through air
Creepage distance (pri. -sec)	d _{Cp}	mm	8	Shortest path along device body
Case material			V0 according to UL 94	
Comparative tracking index	CTI	V	600	

2. Electrical Data

 3. 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/S5	
				500		SHK-500VBS3/S5	
				600		SHK-600VBS3/S5	
				700		SHK-700VBS3/S5	
				800		SHK-800VBS3/S5	
				900		SHK-900VBS3/S5	
Current range (refer remark)	I_{PM}	A	-400		400	SHK-400VBS3/S5	
			-500		500	SHK-500VBS3/S5	
			-600		600	SHK-600VBS3/S5	
			-700		700	SHK-700VBS3/S5	
			-800		800	SHK-800VBS3/S5	
			-900		900	SHK-900VBS3/S5	
Supply voltage	V_{CC}	V		$5 \pm 5\%$		SHK-400VBS3/S5 SHK-500VBS3/S5 SHK-600VBS3/S5 SHK-700VBS3/S5 SHK-800VBS3/S5 SHK-900VBS3/S5	
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/S5 SHK-500VBS3/S5 SHK-600VBS3/S5 SHK-700VBS3/S5 SHK-800VBS3/S5 SHK-900VBS3/S5	@ U_C
Peak output voltage ($V_{out} @ \pm I_{PM}$) – V_{off}	V_{FS}	V		± 2		SHK-400VBS3/S5 SHK-500VBS3/S5 SHK-600VBS3/S5 SHK-700VBS3/S5 SHK-800VBS3/S5 SHK-900VBS3/S5	@ $T_A=25^{\circ}\text{C}$, @ $U_C=5\text{V}$
Internal output resistance	R_{out}	Ω		5		V_{out}	DC to 1KHz

Load resistance	R _L	KΩ	10			All	
Theoretical gain (Typ)	G _{th}	mV/A		5		SHK-400VBS3/S5	@U _C =5 V
				4		SHK-500VBS3/S5	@U _C =5 V
				3.33		SHK-600VBS3/S5	@U _C =5 V
				2.85		SHK-700VBS3/S5	@U _C =5 V
				2.5		SHK-800VBS3/S5	@U _C =5 V
				2.22		SHK-900VBS3/S5	@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	mVpp		10 30		SHK-400VBS3/S5 SHK-500VBS3/S5 SHK-600VBS3/S5 SHK-700VBS3/S5 SHK-800VBS3/S5 SHK-900VBS3/S5	@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

4. Dimension & Pin Definitions

