

## CURRENT SENSOR

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PRODUCT SERIES: SHK-VBS6  
SHK-100VBS6, SHK-200VBS6  
SHK-300VBS6, SHK-400VBS6  
PRODUCT PART NUMBER: SHK-500VBS6, SHK-600VBS6  
SHK-700VBS6, SHK-800VBS6  
SHK-900VBS6  
VERSION: Ver1.0



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## 1. Description

The SHK-VBS6 series current sensor is based on TMR (tunnel magnetoresistance) technology and 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
- Inverter
- Switched model power supplies (SMPS)

### General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	°C	-40 ~ 105
Storage temperature	T_stg	°C	-40 ~ 105
Mass	m	g	38

### Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	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	Ud	kV	4	
Impulse withstand voltage 1.2/50μs	Ūw	kV	6	
Clearance distance (pri. -sec)	dCl	mm	7.5	Determined by customer's layout
Creepage distance (pri. -sec)	dCp	mm	7.5	

### Measuring current table

Product	Optimized Range I <sub>pn</sub> (A)	Sensitivity, (mV/A)	T(°C)
SHK-100VBS6	±100 A	20	-40 ~ 105
SHK-200VBS6	±200A	10	-40 ~ 105
SHK-300VBS6	±300A	6.67	-40 ~ 105
SHK-400VBS6	±400A	5	-40 ~ 105
SHK-500VBS6	±500A	4	-40 ~ 105
SHK-600VBS6	±600A	3.33	-40 ~ 105
SHK-700VBS6	±700A	2.86	-40 ~ 105
SHK-800VBS6	±800A	2.5	-40 ~ 105
SHK-900VBS6	±900A	2.22	-40 ~ 105

## 2. Electrical data SHK-VBS6

Condition: Vcc = 5.0 V, T\_A = 25°C, unless specified.

Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary current	I <sub>pn</sub>	A	-100		100	SHK-100VBS6
			-200		200	SHK-200VBS6
			-300		+300	SHK-300VBS6
			-400		400	SHK-400VBS6
			-500		500	SHK-500VBS6
			-600		600	SHK-600VBS6
			-700		700	SHK-700VBS6
			-800		800	SHK-800VBS6
			-900		900	SHK-900VBS6
Supply voltage	V <sub>cc</sub>	V	4.75	5	5.25	
Consumption current	I <sub>cc</sub>	mA		15		
Full-scale output	V <sub>FS</sub>	V		±2		(V <sub>out</sub> @ ±I <sub>pn</sub> ) – V <sub>off</sub>
Output resistance	R <sub>out</sub>	Ω		1		@V <sub>out</sub>
Offset voltage	V <sub>off</sub>	V	2.475	2.5	2.525	V <sub>out</sub> @ 0 A
Theoretical gain	G <sub>th</sub>	mV/A		20		SHK-100VBS6
				10		SHK-200VBS6
				6.67		SHK-300VBS6
				5		SHK-400VBS6
				4		SHK-500VBS6
				3.33		SHK-600VBS6
				2.86		SHK-700VBS6
				2.5		SHK-800VBS6
				2.22		SHK-900VBS6
Non-linearity	Non-L	%I <sub>pn</sub>	-1	0.5	1	±I <sub>pn</sub>
Step response time	t <sub>res</sub>	μs		6	10	@90% of I <sub>PN</sub>
-3dB band width	BW	kHz		30		Back-end non-RC circuit
Noise DC ~ 10 kHz DC ~ 100 kHz	V <sub>noise</sub>	mVpp		15 20		
Accuracy @ RT	X	% of I <sub>pn</sub>	-1		1	@ 25°C
Accuracy	X <sub>TRange</sub>	% of I <sub>pn</sub>	-2.5		2.5	-40°C ~ 85°C

Note:

- Accuracy @ RT, X = ((V<sub>out</sub> @ I<sub>n</sub> @ 25°C) – (G<sub>fit</sub> \* I<sub>n</sub> + V<sub>off</sub> @ 25°C)) / V<sub>FS</sub>, Here I<sub>n</sub> is the current test current. G<sub>fit</sub> is the normal temperature fitting gain.

2. Accuracy,  $X_{TRange} = ((V_{out} @ I_n @ T_x) - (G_{fit@25^\circ C} * I_n + V_{off @ 25^\circ C})) / V_{FS}$ , The fitting gain of the product at  $G_{fit@25^\circ C}$  is  $25^\circ C$ .

### 3. Frequency band width

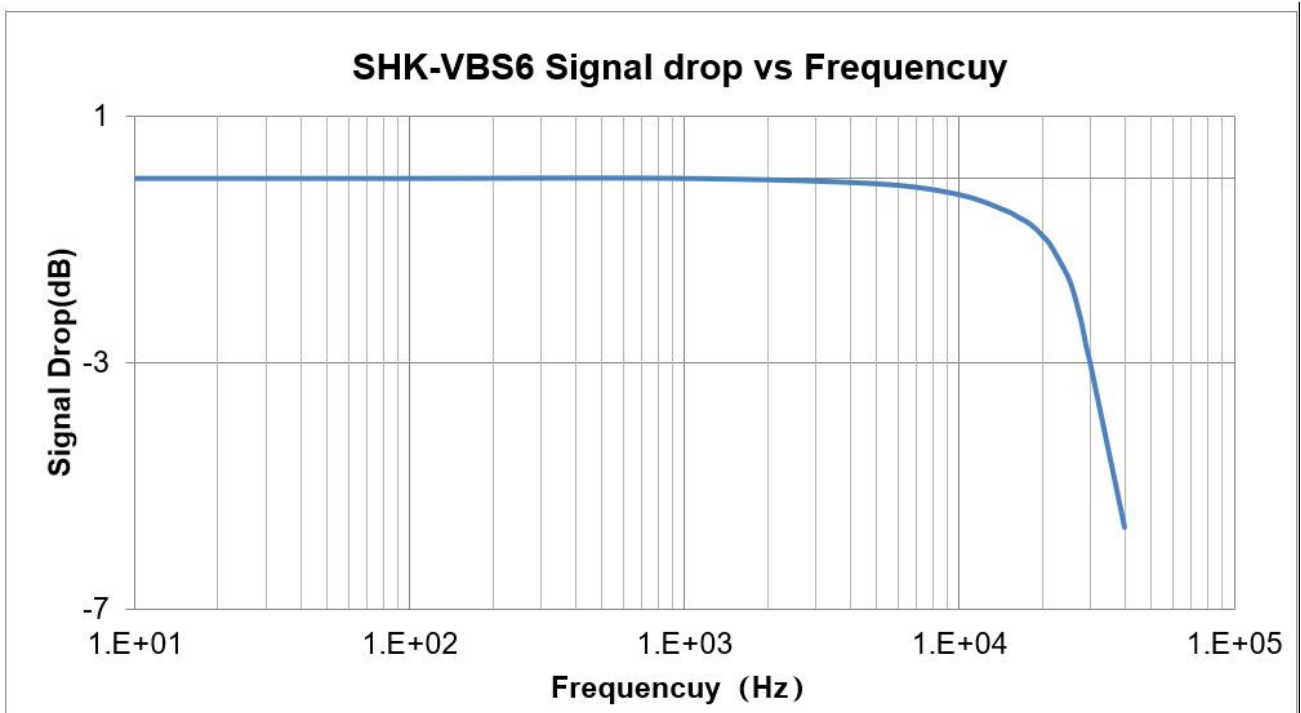


Fig.1 the band width of SHK-VBS2 series current sensors. The bandwidth of the sensor is in the range of DC ~30 kHz (-3 dB).

### 4. SHK VBS6 Dimensions & Pins & Footpri

