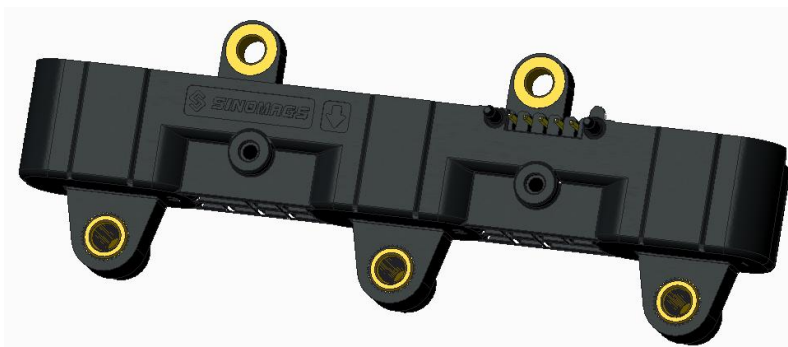


Current Sensor

Product Series: SHK-VBS-TL

Part number: SHK-VBS-TL-800-S2
SHK-VBS-TL-1000-S2
SHK-VBS-TL-1200-S2

Version: Ver 1.3



CONTENT

1.	Description	2
2.	Electrical data	3
3.	Dimension & Pin definitions	5

1. Description

The SHK-VBS-T 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	°C	-40 ~ 125
Storage temperature	T_{stg}	°C	-40 ~ 125
Mass	m	g	65

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	2.8	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	9	Shortest distance through air
Creepage distance (pri. -sec)	d_{cp}	mm	9	Shortest path along device body
Comparative tracking index	CTI	V	600	IEC60112
Case material			V0 according to UL 94	

Selection Guide

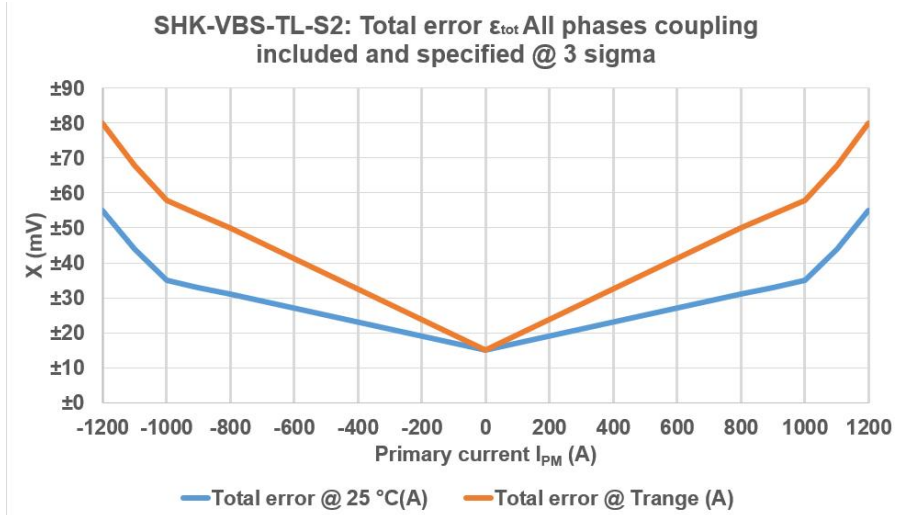
Product	Nominal current	Measuring range
SHK-VBS-TL-800-S2	800 A	800 A
SHK-VBS-TL-1000-S2	1000 A	1000 A
SHK-VBS-TL-1200-S2	1200 A	1200 A

2. Electrical data

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current measuring range	I_{PM}	A	-800		800	SHK-VBS-TL-800-S2
			-1000		1000	SHK-VBS-TL-1000-S2
			-1200		1200	SHK-VBS-TL-1200-S2
Supply voltage	V_{CC}	V	4.75	5	5.25	
Current consumption	I_{CC}	mA		40	50	@ $V_{CC} = 5.0\text{ V}$
Output voltage	V_{OUT}	V	$(V_{CC}/5) \times (V_{off} + G \times I_P)$			@ $T_a = 25^\circ\text{C}$
Quiescent voltage	V_{off}	V		2.5		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Sensitivity	G	mV/A		2.5		SHK-VBS-TL-800-S2
				2.00		SHK-VBS-TL-1000-S2
				1.67		SHK-VBS-TL-1200-S2
Load resistance	R_L	k Ω	10			
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		± 4		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$
Magnetic offset voltage error	V_{OM}	mV		± 3		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, 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		@ $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, $-1000\text{ A} < I_P < 1000\text{ A}$
Response time	T_r	μs		2	6	@ 90% of I_{PM}
Frequency bandwidth (-3 dB)	BW	kHz	40			No RC circuit
Output voltage noise	$V_{no,pp}$	mV		10		@ DC ~ 140 kHz

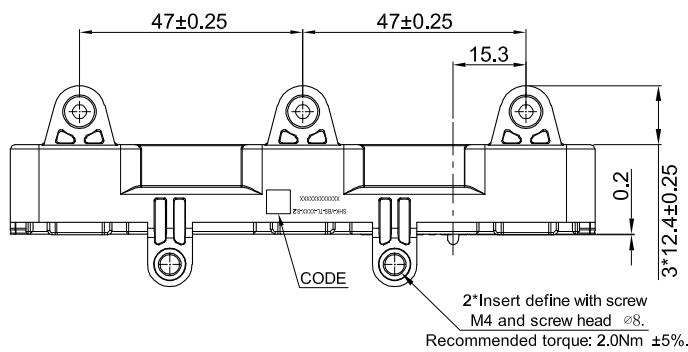
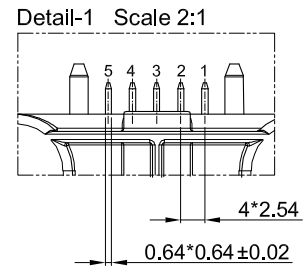
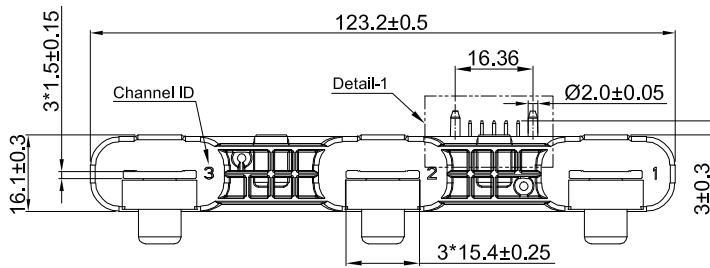
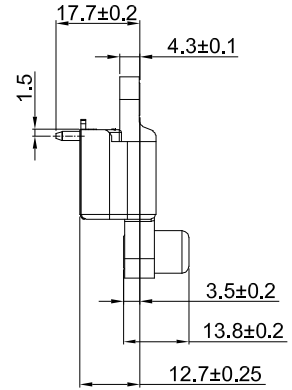
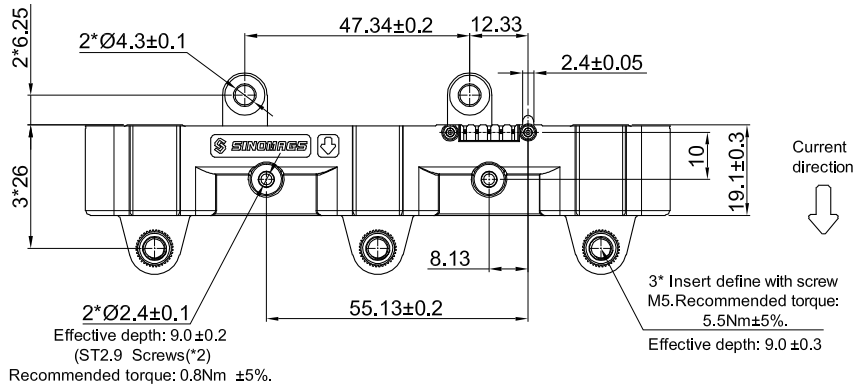
Phase shift	$\Delta\varphi$	°	-4			@ DC ~ 1 kHz
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Total error(mV) for $\leq 1200A$



I_{PM}	Total error specification	
	@ $T_a=25^{\circ}C$, $V_{CC}=5.0V$	@ $-40^{\circ}C \leq T_a \leq 125^{\circ}C$, $V_{CC}=5.0V$
(A)	(mV)	(mV)
1200	±55	±80
1100	±44	±68
1000	±35	±58
900	±33	±54
800	±31	±50
0	±15	±15
-800	±31	±50
-900	±33	±54
-1000	±35	±58
-1100	±44	±68
-1200	±55	±80

3. Dimension & Pin definitions



Terminals:

Pin 1	Vcc
Pin 2	GND
Pin 3	Output 1
Pin 4	Output 3
Pin 5	Output 2