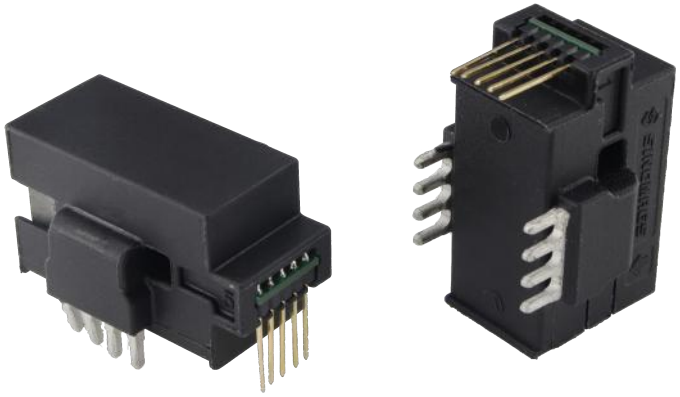
Current Sensor

Product Series： STK-HO/B

Part number： STK-30HO/B,
STK-50HO/B,
STK-75HO/B,
STK-100HO/B,
STK-130HO/B,



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CONTENT

1. Summary

The STK-HO/B series is based on TMR (Tunneling-Magnetoresistance) technology and open-loop design. It is suitable for DC, AC, pulsed and any kind of irregular current measurement under the isolated conditions. The nominal current range of the STK-HO/B current sensor consists of 50 A, 75 A, 100 A, 130 A.

Typical applications

- AC variable speed and servo motor drives
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Combiner box
- Solar inverter on DC side of the inverter (MPPT)
- Plasma cutter, welding
- Charging station.

General parameter

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

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage（non-destructive）	V_C	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

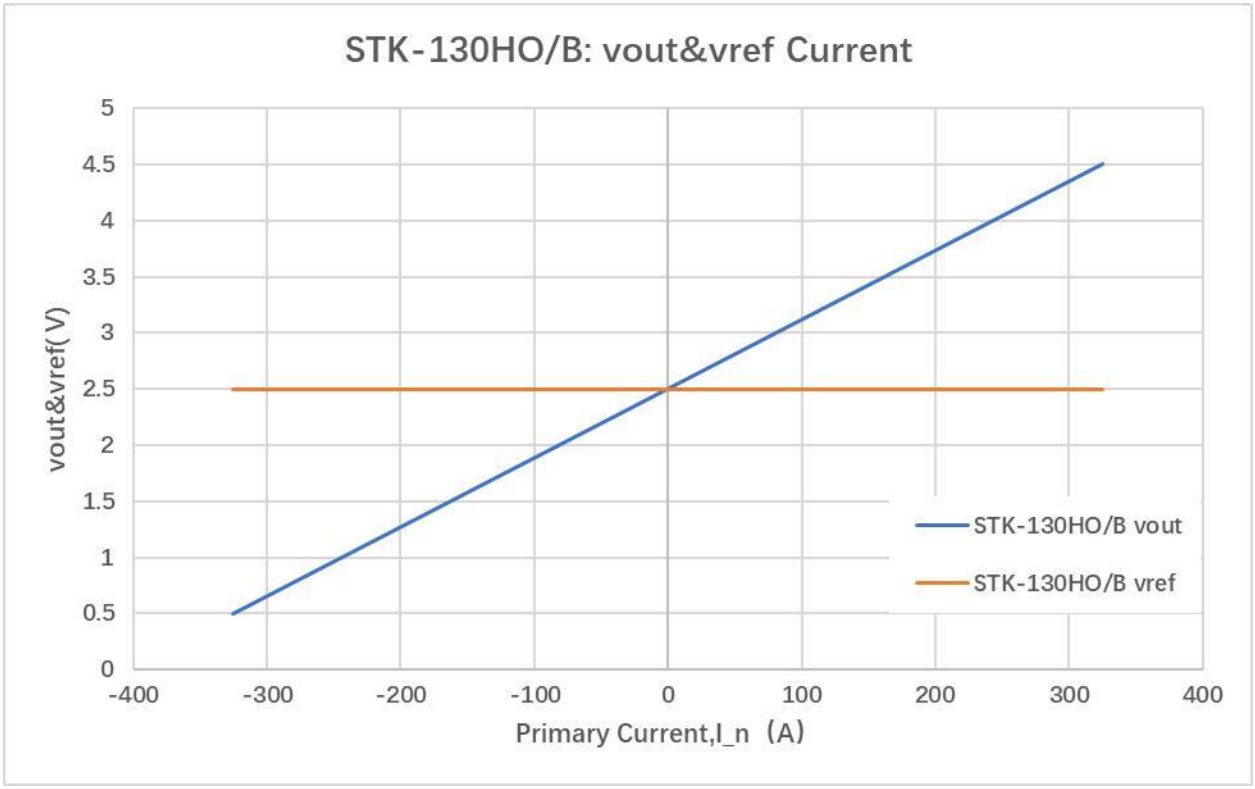
Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	4	@ 50Hz/1 min
Impulse withstand voltage 1.2/50μs	Ûw	kV	8	1.2/50μs
Clearance distance (pri. -sec)	dCl	mm	11.6	Shortest distance through air
Creepage distance (pri. -sec)	dCp	mm	11.6	Shortest path along device body
Case material			V0	According to UL 94
Application example	CTI	V	600	Reinforced insulation, CAT III, PD 2, non uniform field according EN 50178, IEC 61010

2. STK-HO/B Electrical performance

Condition：T_A = 25℃, Vcc = 5 V (Except special instructions)

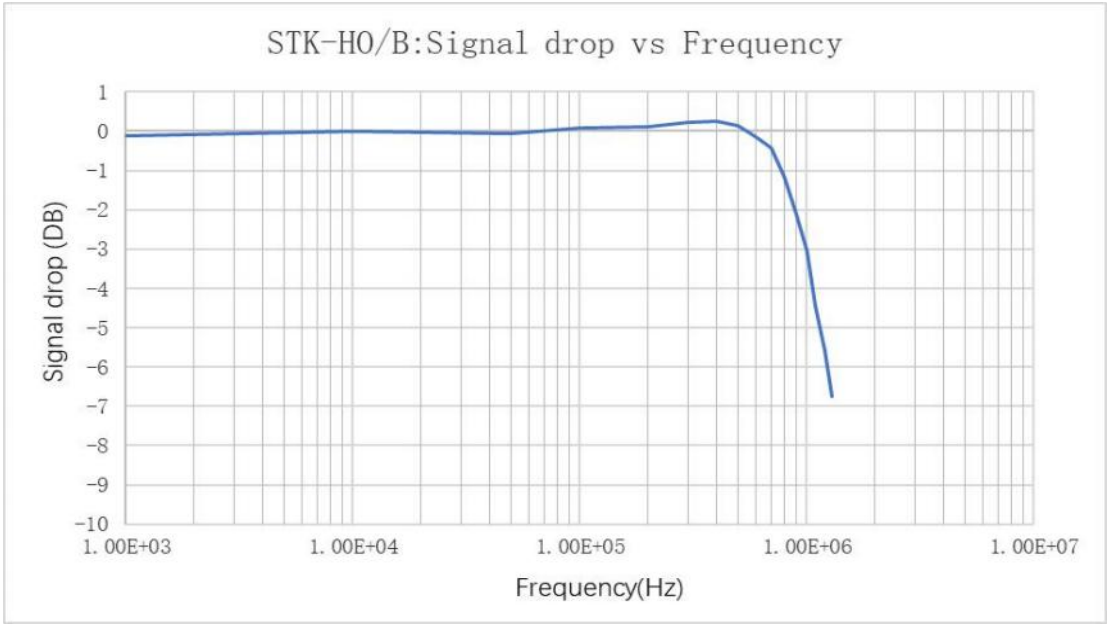
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current rms	I_pn	A		30		STK-30HO/B
				50		STK-50HO/B
				75		STK-75HO/B
				100		STK-100HO/B
				130		STK-130HO/B
Primary current measuring range	I_pm	A	-75		75	STK-30HO/B
			-125		125	STK-50HO/B
			−187.5		187.5	STK-75HO/B
			-250		250	STK-100HO/B
			-325		325	STK-130HO/B
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA	6	7	8	
Reference voltage	Vref	V	2.48	2.5	2.52	Output function
Rated output voltage	V_FS	V		0.8		(Vout - Vref)@ I_pn
Internal output resistance	R_out	Ω		70		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-10		10	(Vout – Vref) @ 0 A
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ~ 105℃
Theoretical gain	G_th	mV/A		26.666		STK-30HO/B
				16		STK-50HO/B
				10.666		STK-75HO/B
				8		STK-100HO/B
				6.154		STK-130HO/B
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-1		1	±I_pm
Step response time	t_res	μs		0.2		@ 90% of I_pn
Frequency bandwidth (-3dB)	BW	kHz		1000		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		 15 25		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ~ 105℃	X_TRange	% of I_pn	-3		3	-40℃ ~ 105℃

3. Output voltage VS primary current



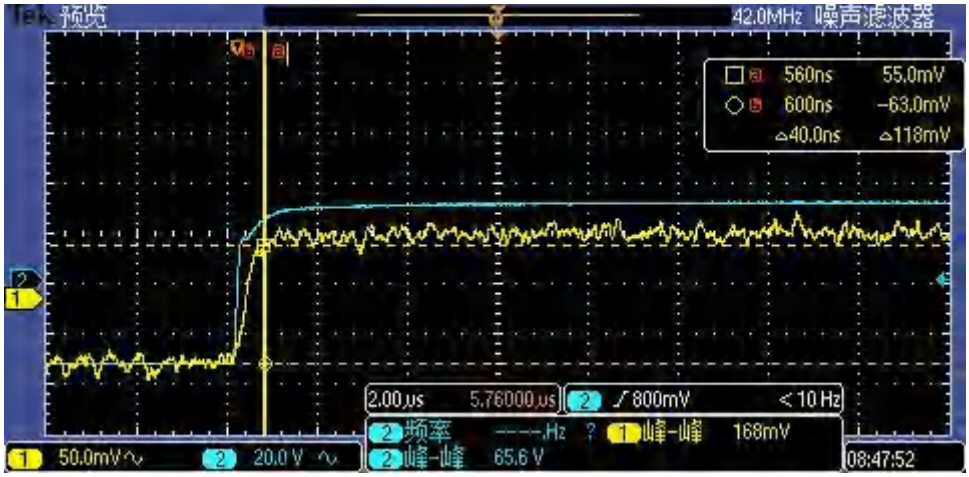
The dependence of Vout of STK-130HO/B on the primary current.

4. Frequency bandwidth



The frequency bandwidth of STK-HO/B series current sensor. The bandwidth of current sensor is DC ~ 1000 kHz (-3dB).

5. Step response time



The typical frequency response of STK-HO/B current sensor. The response time from 90% of the primary current (light blue) to 90% of the secondary output (yellow) is less than 0.2 µs.

6. Dimension & Pin definitions