Current Sensor
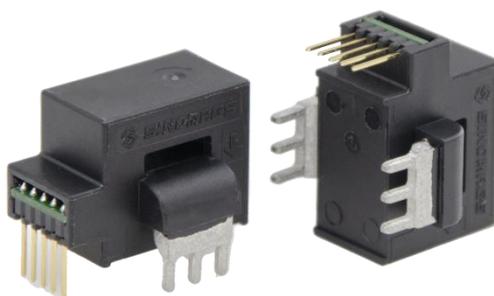
Product Series： STK-HO-Z

Part number：
STK-150HO-Z
STK-180HO-Z
STK-200HO-Z
STK-250HO-Z
STK-300HO-Z

Version: Ver1.8

Sinomags Technology Co., Ltd
Web site: www.sinomags.com

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2026-01-22

CONTENT

1. Summary

The STK-HO-Z series is based on open-loop technology and design. It is suitable for DC, AC, pulse and any type of irregular current measurement under isolated conditions. The nominal current range of STK-HO-Z current sensors includes 150 A, 180 A, 200 A, 250 A, 300A.

Typical applications

- PV combiner box
- PV inverter (MPPT & AC)
- motor driver controller
- SMPS & UPS
- Battery management system

Standards
- EN50178:1997
- IEC 61010-1:2010
- IEC 61326-1:2012

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	℃	-40 ~ 105
Storage temperature	T_{stg}	℃	-40 ~ 105
Mass	m	g	23.6

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage（non-destructive）	V_C	V	6.0
ESD rating（HBM）	U_{ESD}	kV	4
ESD rating（CDM）	U_{CDM}	kV	1.5

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.

Ratings

Parameter	Symbol	Unit	Value
Primary involved potential		V AC/DC	600
Ambient operating temperature	T_A	℃	105
Primary current	I_p	A	According to series primary current
Secondary supply voltage	U_c	V DC	5
Output voltage	V_out	V	0.1 ~ 4.9

Isolation parameter

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	5	
Impulse withstand voltage 1.2/50µs	Ûw	kV	8	
Clearance distance (pri. -sec)	dCl	mm	11	Shortest distance through air
Creepage distance (pri. -sec)	dCp	mm	11	Shortest path along device body
Comparative trraking index	CTI	V	600	
Case material			V0 according to UL 94	
Application example		V	600	Reinforced insulation, CAT III, PD 2, non uniform field according EN 50178, IEC 61010
Application example		V	1000	Basic insulation, CAT III, PD 2, non uniform field according EN 50178, IEC 61010
Application example		V	1500	Basic insulation, CAT III, PD 2, according to IEC 62109-1 Altitude ≤ 3000 m
Application example		V	600	CAT III, PD 2, according to UL 508

2. STK-150HO-Z 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		150		
Primary current measuring range	I_pm	A	-375		375	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		8	10	
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		1		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-5		5	T_A @ 25℃
Magnetic offset current	I_om	A	-0.75		0.75	@ ±10 x I_pn
Theoretical gain	G_th	mV/A		5.333		800mV @ I_pn
Error of gain	Err_G	%G_th		±1		Trimmed in the factory @ 25℃
Temperature drift of gain	G_TR	%G_th	-1.0		1.0	-40℃ ～105℃
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ～105℃
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-3		3	±I_pm
Reaction time	t_ra	μs			1	@ 10% of I_pn
Step response time	t_res	μs		0.3	1	@ 90% of I_pn
Delay time	t_delay	μs			1	300 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		300		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ～105℃ ①	X_TRange	% of I_pn	-2		2	-40℃ ～105℃

Remarks:

①．the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature .

3. STK-180HO-Z 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		180		
Primary current measuring range	I_pm	A	-450		450	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		8	10	
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		1		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-5		5	T_A @ 25℃
Magnetic offset current	I_om	A	-0.9		0.9	@ ±10 x I_pn
Theoretical gain	G_th	mV/A		4.444		800mV @ I_pn
Error of gain	Err_G	%G_th		±1		Trimmed in the factory @ 25℃
Temperature drift of gain	G_TR	%G_th	-1.0		1.0	-40℃ ~ 105℃
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ~ 105℃
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-3		3	±I_pm
Reaction time	t_ra	μs			1	@ 10% of I_pn
Step response time	t_res	μs		0.3	1	@ 90% of I_pn
Delay time	t_delay	μs			1	300 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		300		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ~ 105℃①	X_TRange	% of I_pn	-2		2	-40℃ ~ 105℃

Remarks:

①. the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature .

4. STK-200HO-Z 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		200		
Primary current measuring range	I_pm	A	-500		500	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		8	10	
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		1		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-5		5	T_A @ 25℃
Magnetic offset current	I_om	A	-1		1	@ ±10 x I_pn
Theoretical gain	G_th	mV/A		4		800mV @ I_pn
Error of gain	Err_G	%G_th		±1		Trimmed in the factory @ 25℃
Temperature drift of gain	G_TR	%G_th	-1.0		1.0	-40℃ ~ 105℃
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ~ 105℃
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-3		3	±I_pm
Reaction time	t_ra	µs			1	@ 10% of I_pn
Step response time	t_res	µs		0.3	1	@ 90% of I_pn
Delay time	t_delay	µs			1	300 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		300		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ~ 105℃ ①	X_TRange	% of I_pn	-2		2	-40℃ ~ 105℃

Remarks:

①. the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature .

5. STK-250HO-Z 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		250		
Primary current measuring range	I_pm	A	-625		625	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		8	10	
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		1		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-5		5	T_A @ 25℃
Magnetic offset current	I_om	A	-1.25		1.25	@ ±10 x I_pn
Theoretical gain	G_th	mV/A		3.2		800 mV @ I_pn
Error of gain	Err_G	%G_th		±1		Trimmed in the factory @ 25℃
Temperature drift of gain	G_TR	%G_th	-1.0		1.0	-40℃ ~ 105℃
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ~ 105℃
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-3		3	±I_pm
Reaction time	t_ra	μs			1	@ 10% of I_pn
Step response time	t_res	μs		0.3	1	@ 90% of I_pn
Delay time	t_delay	μs			1	300 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		300		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ~ 105℃ ①	X_TRange	% of I_pn	-2		2	-40℃ ~ 105℃

Remarks:

①. the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature .

6. STK-300HO-Z 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		300		
Primary current measuring range	I_pm	A	-700		700	
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		8	10	
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		1		Output
Quiescent voltage	Voff	V	2.48	2.5	2.52	Vout @ 0 A
Electrical offset voltage	Voe	mV	-5		5	T_A @ 25℃
Magnetic offset current	I_om	A	-1.5		1.5	@ ±10 x I_pn
Theoretical gain	G_th	mV/A		2.6667		800 mV @ I_pn
Error of gain	Err_G	%G_th		±1		Trimmed in the factory @ 25℃
Temperature drift of gain	G_TR	%G_th	-1.0		1.0	-40℃ ~ 105℃
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40℃ ~ 105℃
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-3		3	±I_pm
Reaction time	t_ra	µs			1	@ 10% of I_pn
Step response time	t_res	µs		0.3	1	@ 90% of I_pn
Delay time	t_delay	µs			1	300 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		300		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Accuracy @ 25℃	X	% of I_pn	-1		1	@ 25℃
Accuracy @ -40℃ ~ 105℃ ①	X_TRange	% of I_pn	-2		2	-40℃ ~ 105℃

Remarks：

①. the accuracy @ -40℃~105℃, X_TRange = (((Vout – Vref)@ In @ T_x) – Voe@ 25℃ – G_th * In) / V_FS, where T_x represents present temperature, G_th is fitted gain at room temperature .
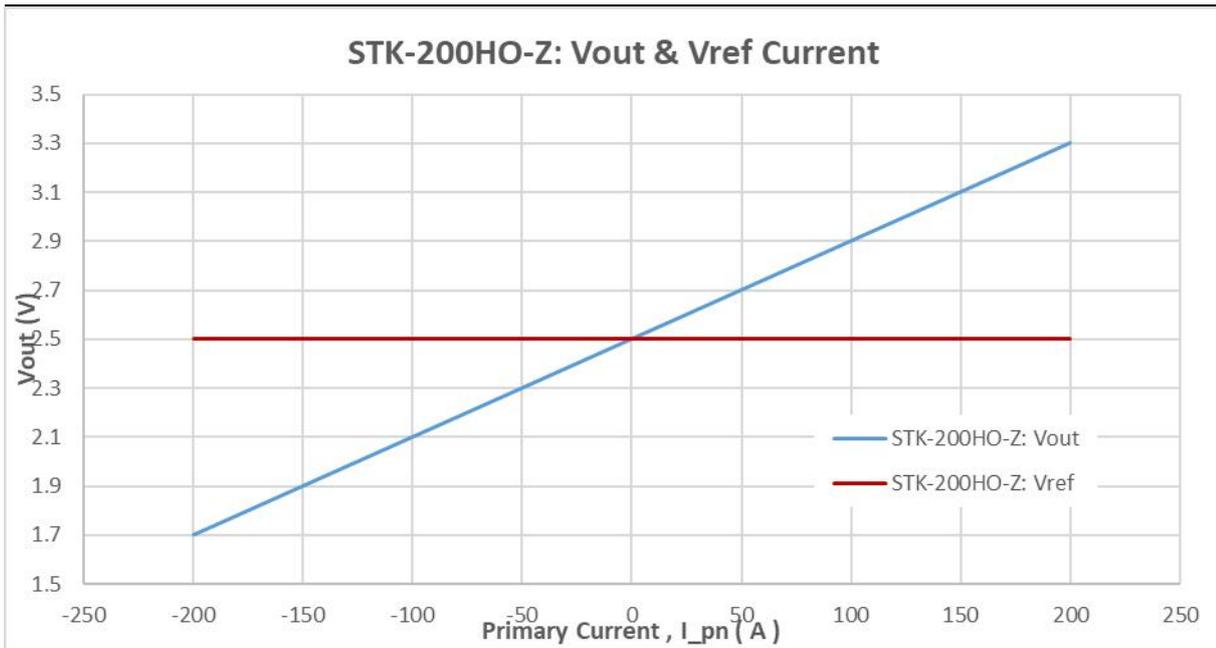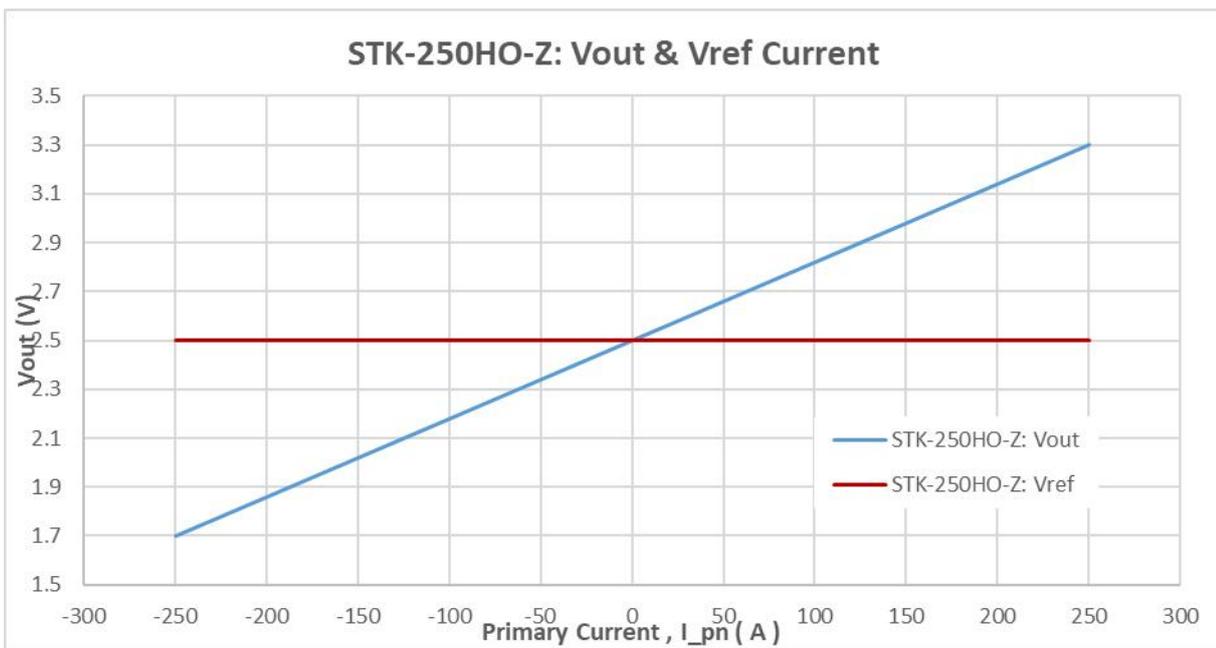
7. Output voltage VS primary current
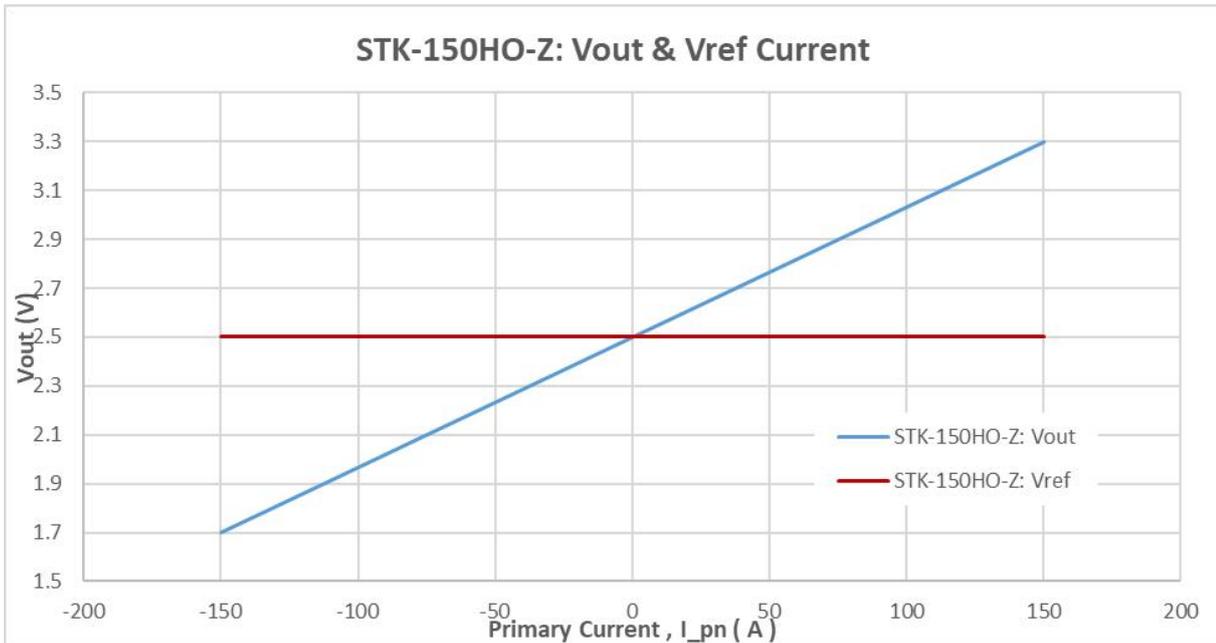
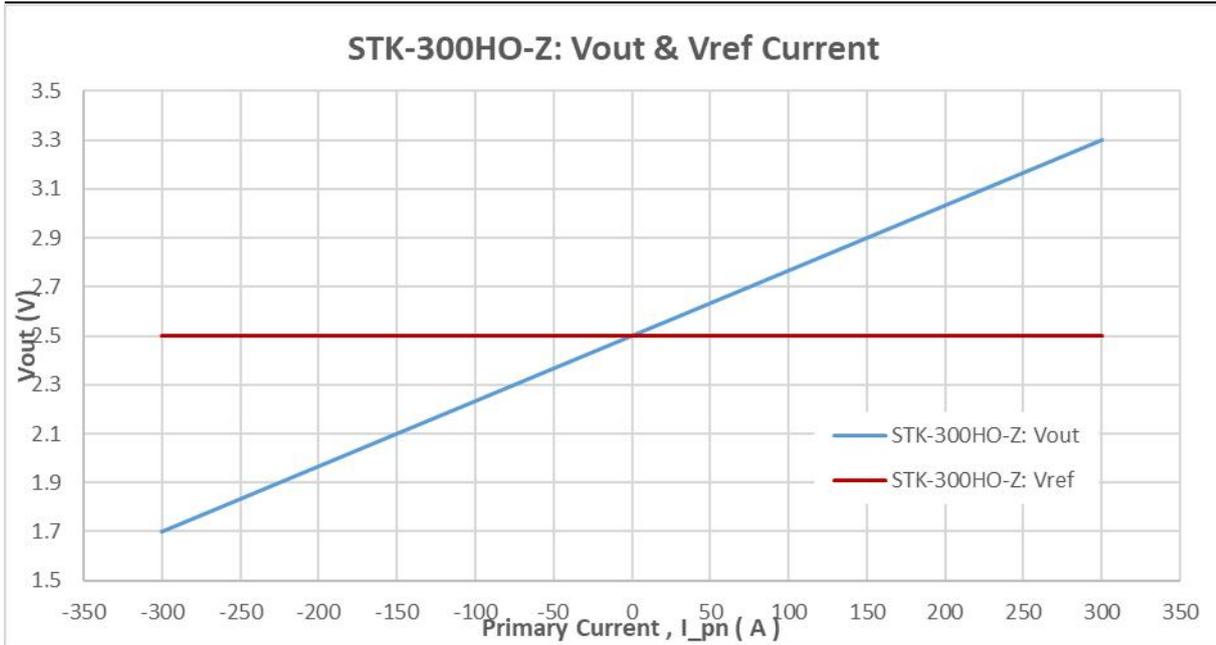The dependence of Vout of STK-150HO-Z on the primary current.
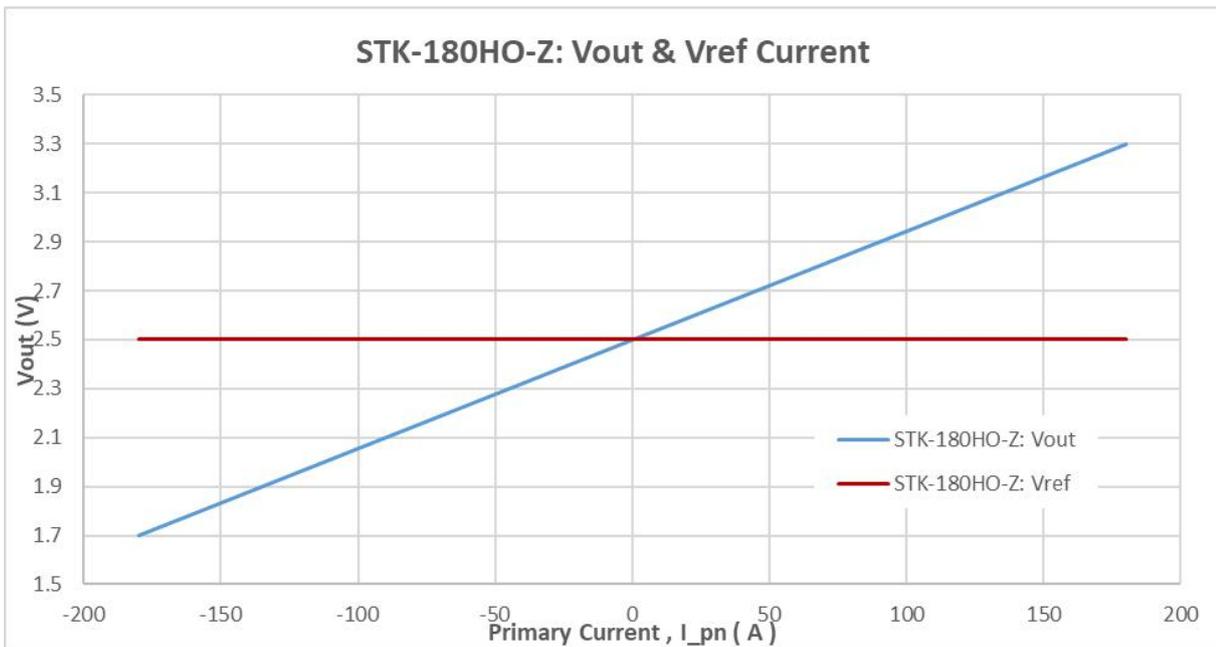
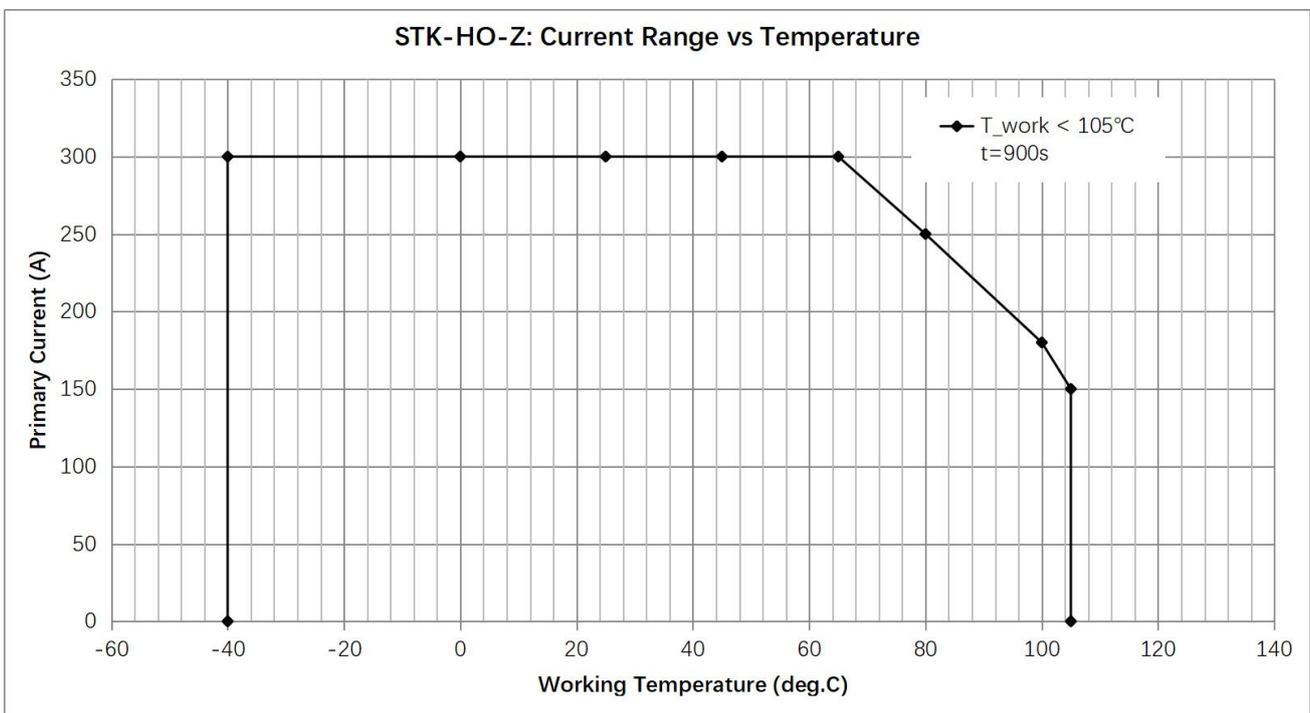The dependence of Vout of STK-180HO-Z on the primary current.

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STK-200HO-Z: Vout & Vref Current

The dependence of Vout of STK-200HO-Z on the primary current.

STK-250HO-Z: Vout & Vref Current

The dependence of Vout of STK-250HO-Z on the primary current.

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The dependence of Vout of STK-300HO-Z on the primary current.

8. Maximum continues DC current

The dependence of maximum continues current of STK-xxHO-Z current on the working temperature.

9. Frequency response and bandwidth
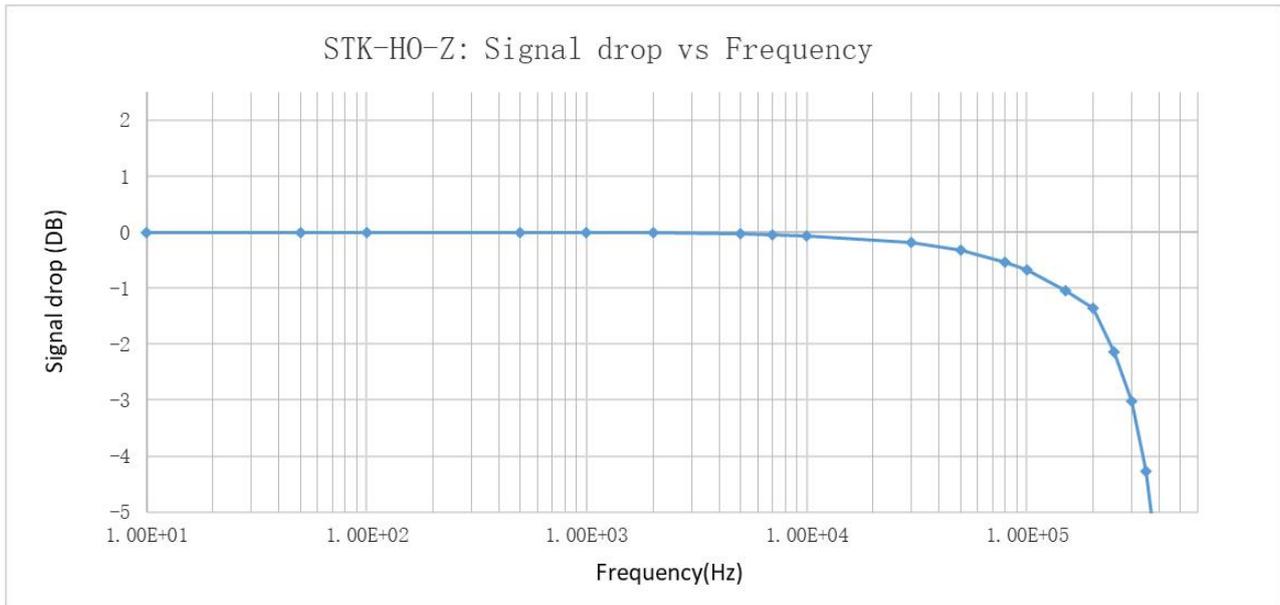
The frequency bandwidth of STK-xxHO-Z series current sensor. The bandwidth of current sensor is DC ~ 300 kHz (-3dB).
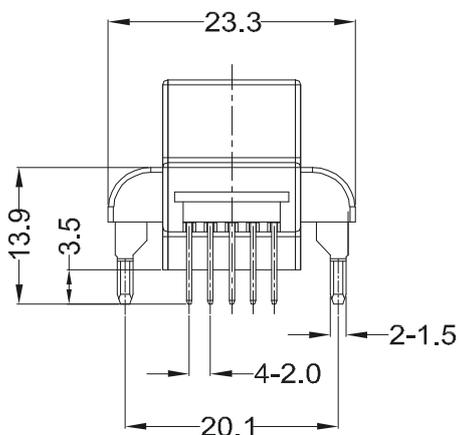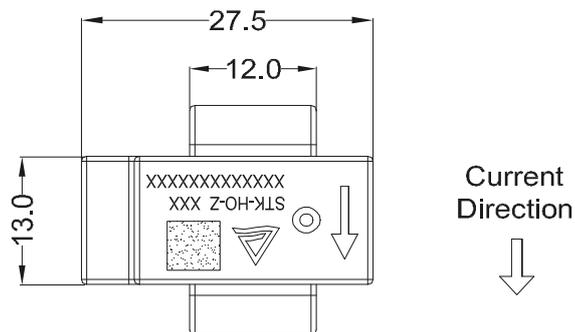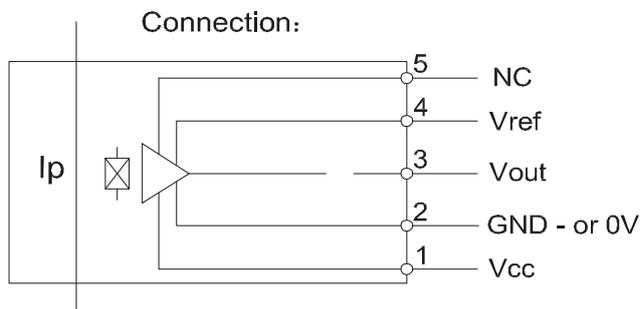
10. Step response time
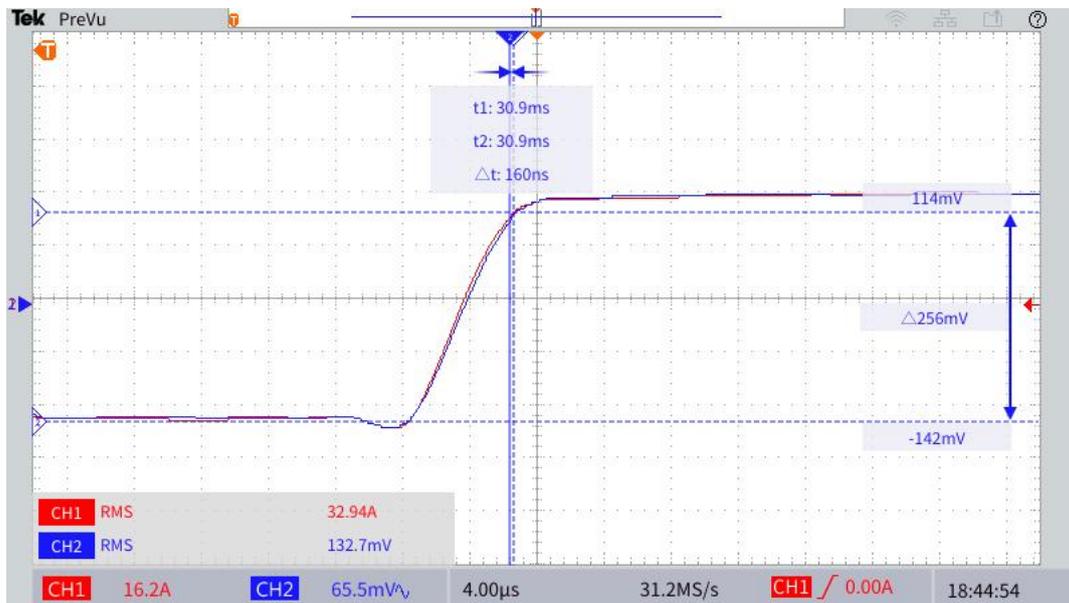
The typical frequency response of STK-xxHO-Z current sensor. The response time from 90% of the primary current (red) to 90% of the secondary output (blue) is less than 1 μs.
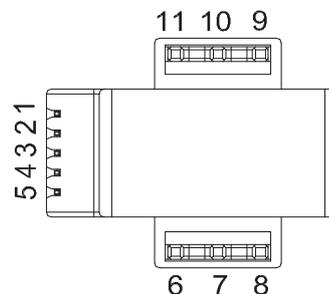
11. Frequency delay performance
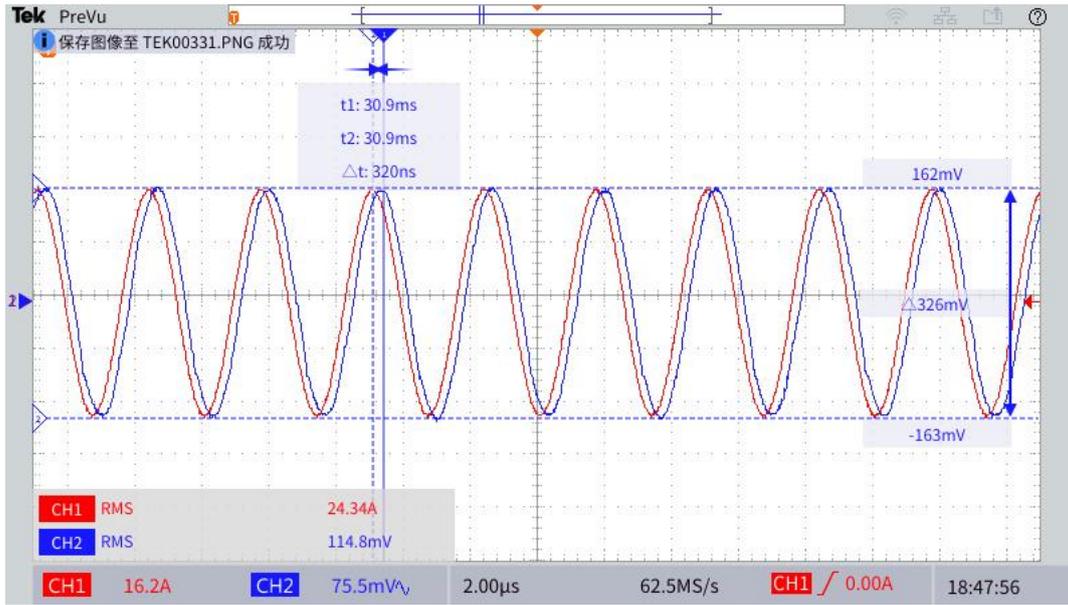
When testing 300 kHz sine wave, the typical result of STK-xxHO-Z current sensor's output. The response time from the primary current (red) to the secondary output (blue) is less than 1 µs.
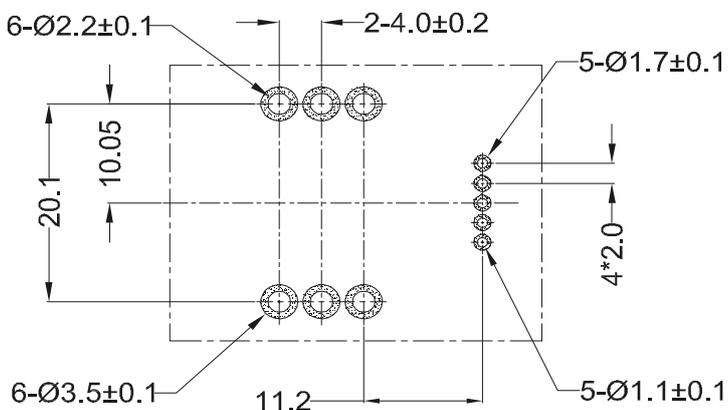
受 控
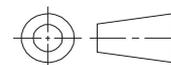2026-01-22

12. Dimension & Pin definitions

Connection：

Pin	Signal
5	NC
4	Vref
3	Vout
2	GND - or 0V
1	Vcc

Ip

27.5
12.0
13.0

XXXXXXXXXXXXX
XXX
STK-H0-Z

Current Direction

23.3
13.9
3.5
2-1.5
4-2.0
20.1

22.5
8.4
19.3
7.0
0.5*0.5
3-1.5
11.2
2-4.0
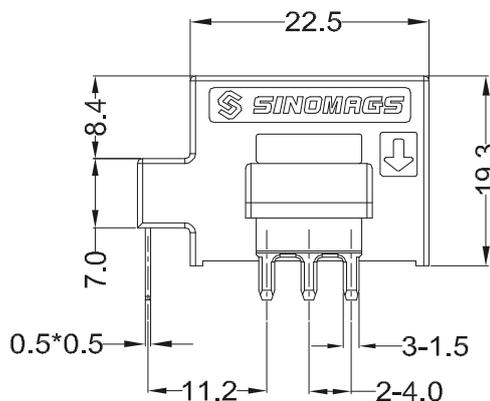
Terminal Pin Identification：

1 ：   Vcc
2 ：   GND
3 ：   Vout
4 ：   Vref（OUT）
5 ：   NC
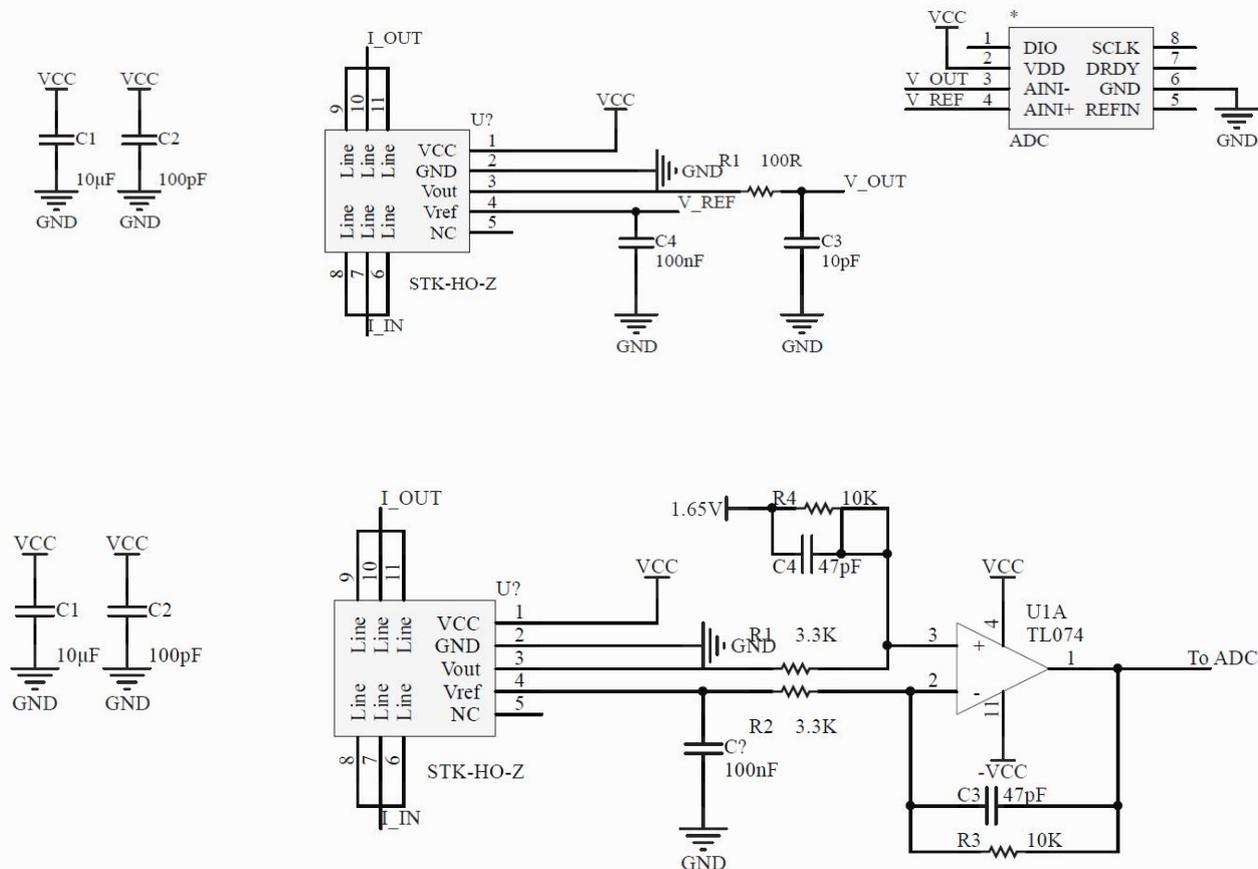6. 7. 8:   Primary input Current (+)
9. 10.11: Primary input Current (-)

11 10 9
5 4 3 2 1
6 7 8

Recommended PCB Layout:

6-Ø2.2±0.1
2-4.0±0.2
5-Ø1.7±0.1
10.05
20.1
4*2.0
6-Ø3.5±0.1
11.2
5-Ø1.1±0.1

Material : Fit UL94V-0 & RoHS
 requirements ;
General tolerance : ±0.5
Unit :mm

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13. Appendix: typical application circuit

Typical application circuits for STK-HO-Z current sensor. The magnification can be estimated as M = R4/R2 with the condition of R1 = R2, and R3 = R4, C3 = C4. The magnification in the above circuit is about 3, The signal input to ADC is 1.65+ R4/R2*(Vout-Vref) .

R3 (kohm)	C3 (pF)	Theoretical -3dB f = 1/(2πRC) (kHz)	Measured -3dB (kHz)
10	47	398	~340
20	81	98	~ 100
20	810	10	~ 10

The frequency characteristics of STK-HO-Z series current sensor are not affected by the R-C setting (according to recommended R-C setting), therefore the active filter circuit or R-C circuit can be applied to modulate the sensor's frequency characteristics.