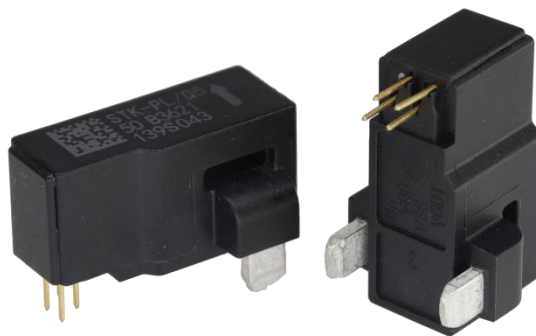


Current Sensor

Product Series: STK-PL/Q

Part number: STK- PL/Q4
STK- PL/Q5

Version: Ver1.2



Sinomags Technology Co., Ltd

Web site: www.sinomags.com

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1. Summary

The STK-PL/Q 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.

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

Absolute maximum rating

Parameter	Symbol	Min	Max	Units	Notes
Supply voltage	VDD	-0.3	6.5	V	VDD pin
Storage Temperature	T _{stg}	-40	150	°C	

Remark: Operation at or beyond these limits may result in permanent damage to the device. Normal operation is not guaranteed at these extremes.

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Notes
Supply voltage	VDD	4.75	5.0	5.25	V	
Output Load Capacitance	CL			30	pF	VOUT pin
Operating Ambient Temperature	T _a	-40		105	°C	

Remark: Electrical characteristics are not guaranteed when operated at or beyond these conditions.

2. STK- 50PL/Q4 Electrical performance

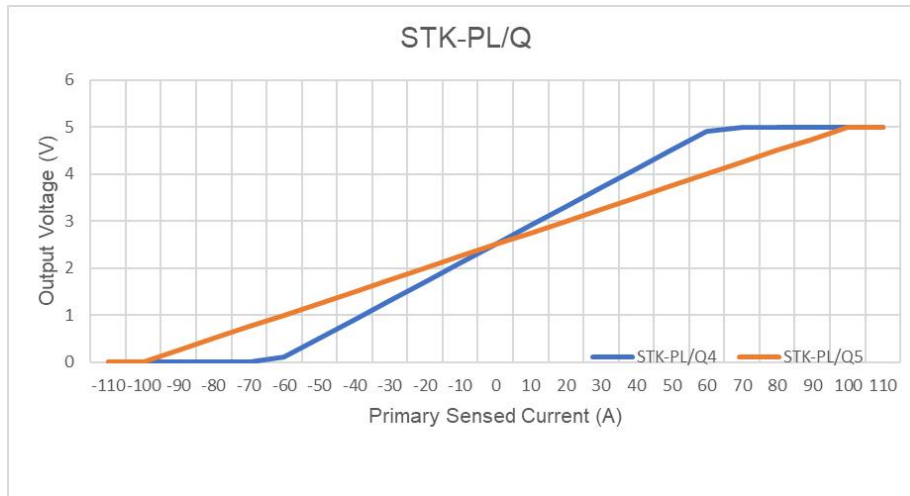
Conditions (unless otherwise specified): Ta = 25°C, VDD = 5V

Parameter	Symbol	Units	Min	Typ	Max	Comment
Maximum Primary Current (RMS)	IRMSmax	A	-50		50	
Current Consumption	IDD	mA		8.3	11	No loads
Sensitivity	Vh	mV/A	39.6	40.0	40.4	
Offset Voltage	Vof	V	2.480	2.500	2.520	IIN = 0A
Linear Sensing Range	INS	A	-54		54	
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	±I_pn
Linearity error @ I_pm	Non-L_pm	%I_pm	-1.5		1.5	±I_pm
Reaction time	t_ra	us		0.5		@ 10% of I_pn
Step response time	t_res	us		1.5		@ 90% of I_pn
Bandwidth	fr	kHz		300		3dB
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		10 15		
Temperature drift of Voe	Voe_TRange	%V_FS	-1.5		1.5	-40°C ~ 105°C
Total Accuracy	ETO	%F.S.	-3		3	Ta = -40 to 105°C
Isolation Voltage	VINS	kV	3			AC 50/60Hz, 60sec
Isolation Resistance	RINS	MΩ	500			DC 1kV
Clearance Distance	dCL	mm	13.6			between the primary and the secondary
Creepage Distance	dCP	mm	15.5			between the primary and the secondary

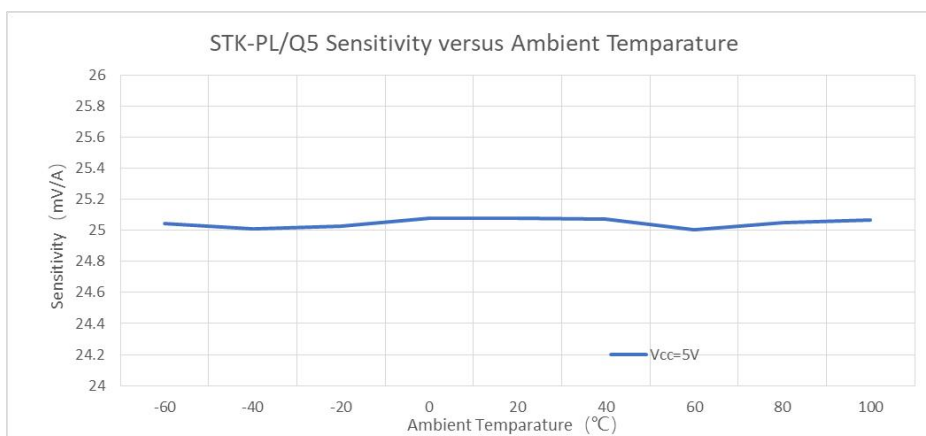
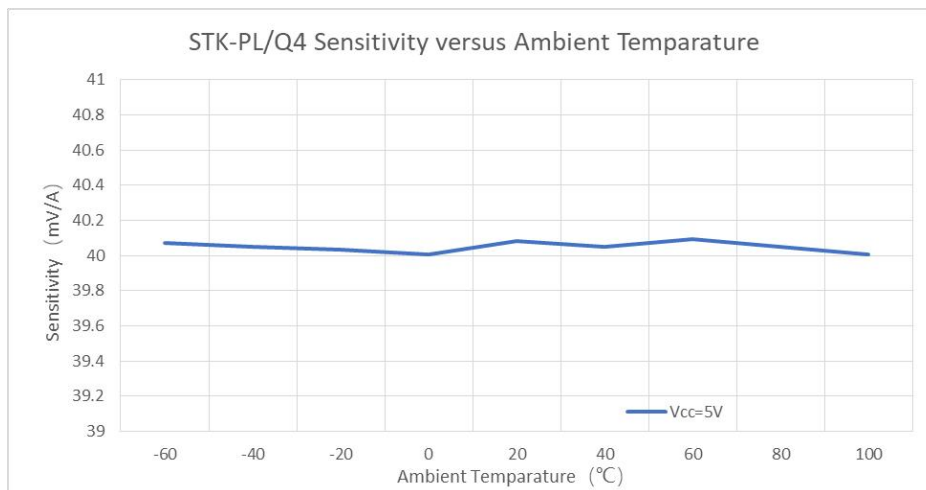
3. STK- 50PL/Q5 Electrical performance

Parameter	Symbol	Units	Min	Typ	Max	Comment
Maximum Primary Current (RMS)	I_{RMSmax}	A	-50		50	
Current Consumption	I_{DD}	mA		8.3	11	No loads
Sensitivity	V_h	mV/A	24.7	25	25.3	
Offset Voltage	V_{of}	V	2.480	2.500	2.520	$I_{IN} = 0A$
Linear Sensing Range	I_{NS}	A	-85		85	
Rated linearity error	$Non-L_{pn}$	% I_{pn}	-0.5		0.5	$\pm I_{pn}$
Linearity error @ I_{pm}	$Non-L_{pm}$	% I_{pm}	-1.5		1.5	$\pm I_{pm}$
Reaction time	t_{ra}	us		0.5		@ 10% of I_{pn}
Step response time	t_{res}	us		1.5		@ 90% of I_{pn}
Bandwidth	f_r	kHz		300		3dB
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	V_{noise}	mVpp		10 15		
Temperature drift of V_{oe}	V_{oe_TRange}	% V_{FS}	-1.5		1.5	-40°C ~ 105°C
Total Accuracy	E_{TO}	%F.S.	-3		3	$T_a = -40$ to 105°C
Isolation Voltage	V_{INS}	kV	3			AC 50/60Hz, 60sec
Isolation Resistance	R_{INS}	MΩ	500			DC 1kV
Clearance Distance	d_{CL}	mm	13.6			between the primary and the secondary
Creepage Distance	d_{CP}	mm	15.5			between the primary and the secondary

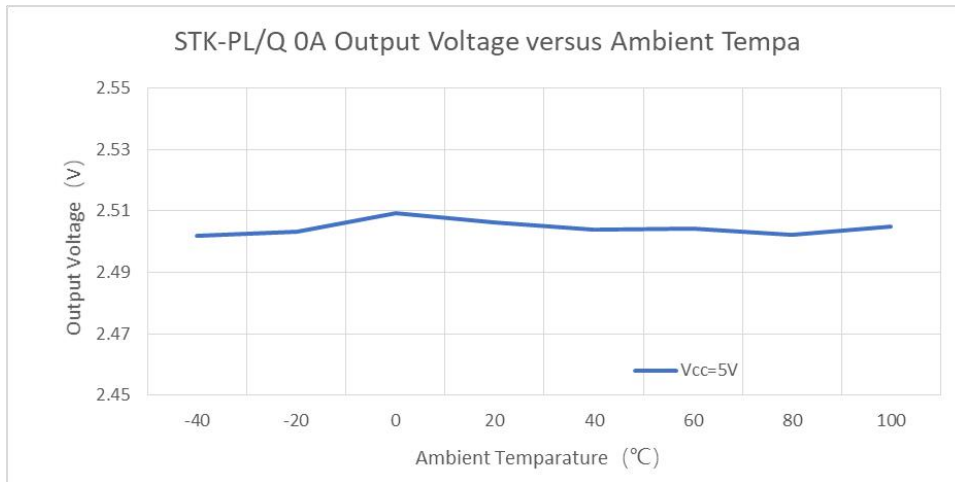
4. Output Characteristics



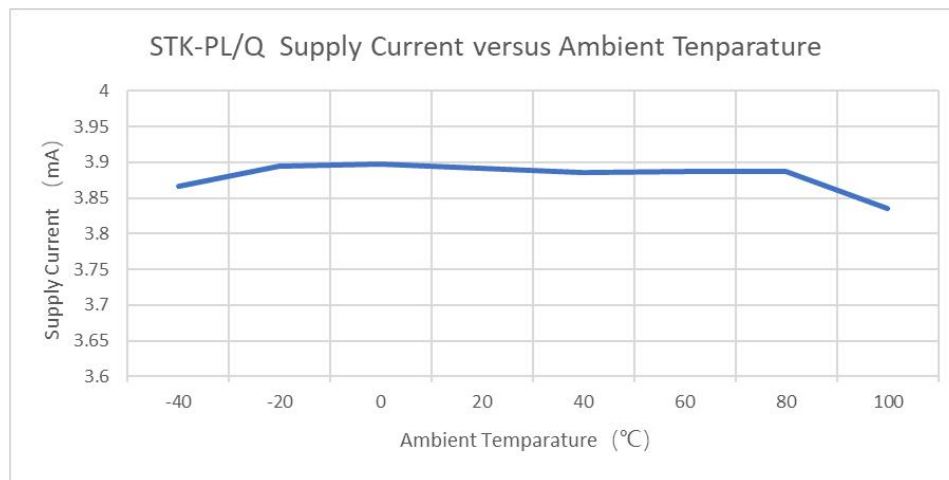
5. Sensitivity versus Ambient Temperature



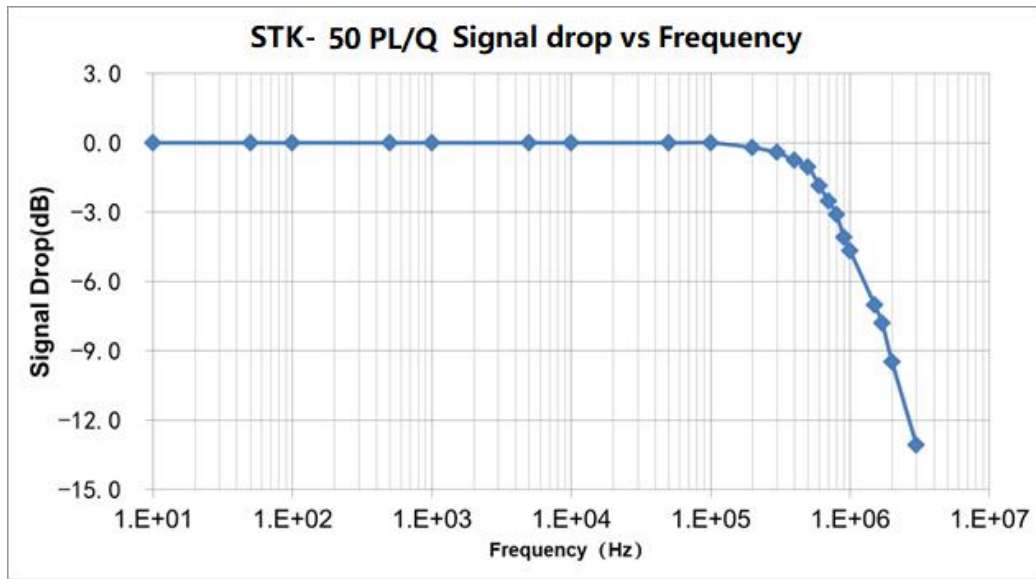
6. 0A Output Voltage versus Ambient Temperature



7. Supply Current versus Ambient Temperature

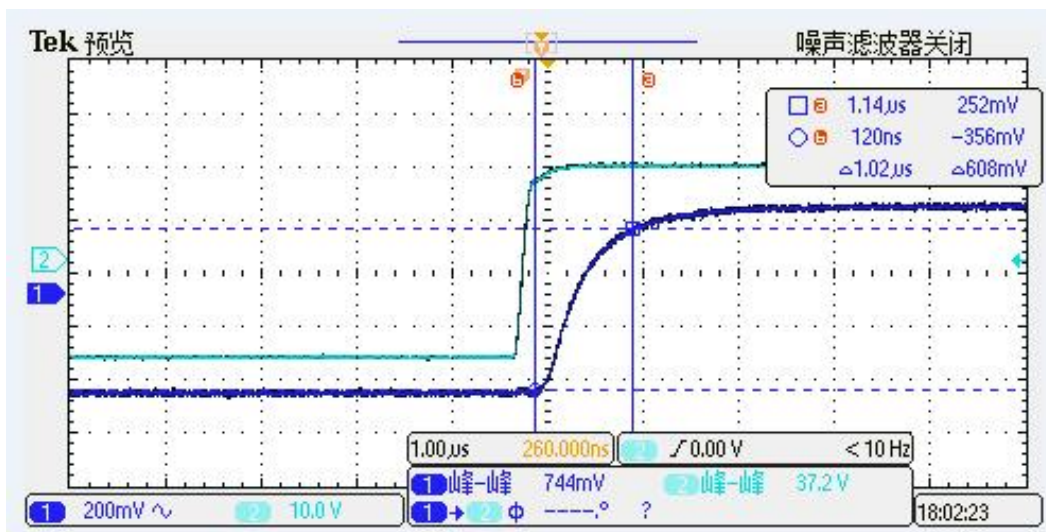


8. Frequency response and bandwidth



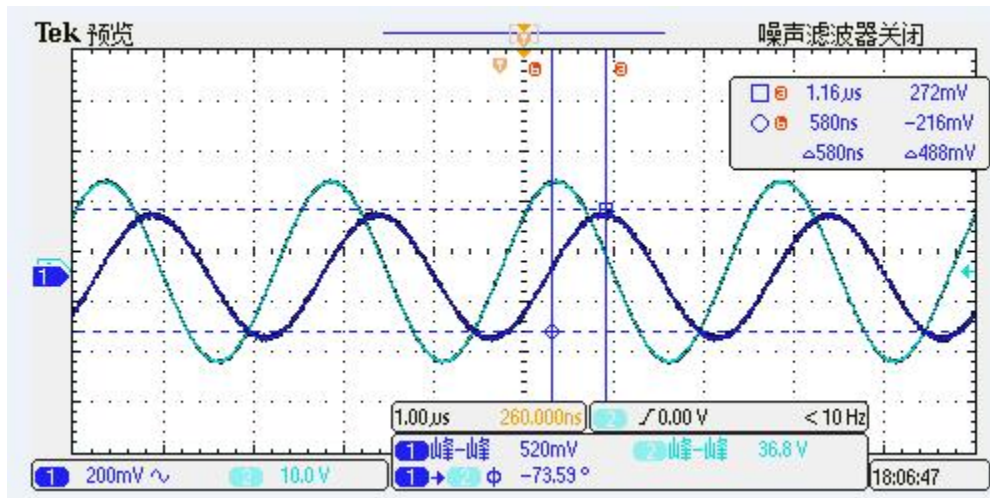
The frequency bandwidth of STK-PL/Q series current sensor. The bandwidth of current sensor is DC ~ 400 kHz (-3dB).

9. Step response time



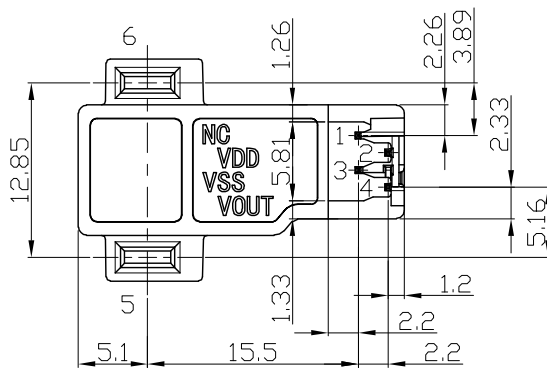
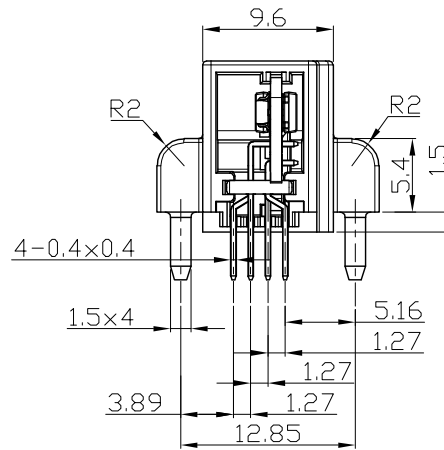
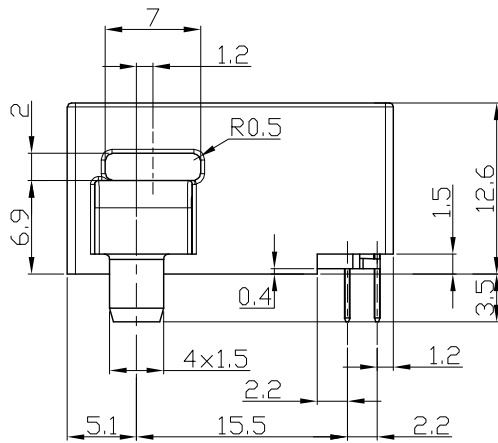
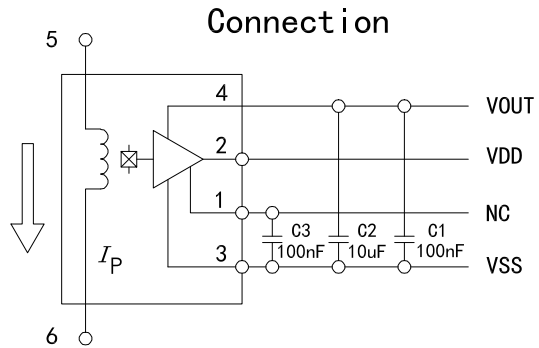
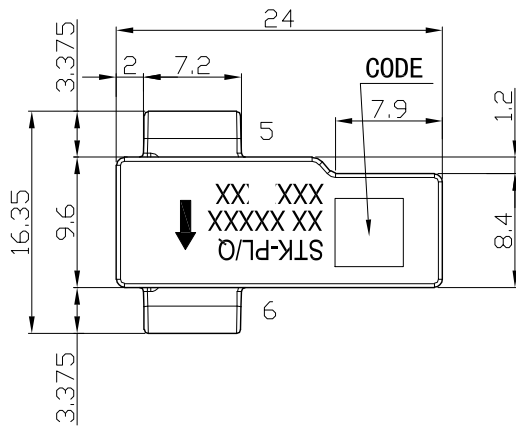
The typical frequency response of STK-PL/Q current sensor. The response time from 90% of the primary current (light blue) to 90% of the secondary output (dark blue) is less than 1 μs

10. Frequency delay performance



When testing 400 kHz sine wave, the typical result of STK-PL/Q current sensor's output. The response time from the primary current (light blue) to the secondary output (dark blue) is less than 1 μ s.

11. Dimension & Pin definitions



Terminal Pin Identification

- 1 : NC
- 2 : VDD
- 3 : VSS
- 4 : VOUT
- 5 : Primary input Current (+)
- 6 : Primary input Current (-)

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

