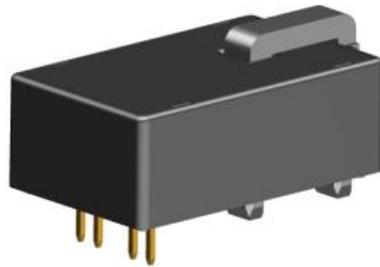


CURRENT SENSOR

Product series: STK-CTS/CD

Product part number: STK-30CTS/CD
STK-50CTS/CD

Version: V1.7



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1. Description

STK-CTS/CD current sensor is based on the hall open loop principle. DC, AC, pulses and any kind of irregular wave can be measured by the current sensor under the isolated conditions.

2. Conventional current detection function

2.1 General Parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	°C	-40~105
Storage temperature	T_stg	°C	-40~105
Mass	m	g	12

Remark1: The product will not be damaged at 105°C

2.2 Absolute Parameter

Parameter	Symbol	Unit	Value
Supply voltage	V _C	V	6
ESD rating (HBM)	U _{esd}	KV	4

Remark2: 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.

2.3 Isolation parameters

Parameter	Symbol	Unit	Value	Remark
Isolation voltage, 50Hz, 1 min	U _d	kV	4	
Impact voltage 1.2/ 50s	Ū _w	kV	10	
Clearance	d _{Cl}	mm	> 10.6	Shortest distance through air
Creepage distance	d _{Cp}	mm	> 10.6	Shortest distance along device body
Case material			V0 according to UL 94	

2.4 STK-30CTS/CD Parameters

 Condition: $V_{cc} = 5.0\text{ V}$, $T_A = 25^\circ\text{C}$, unless specified

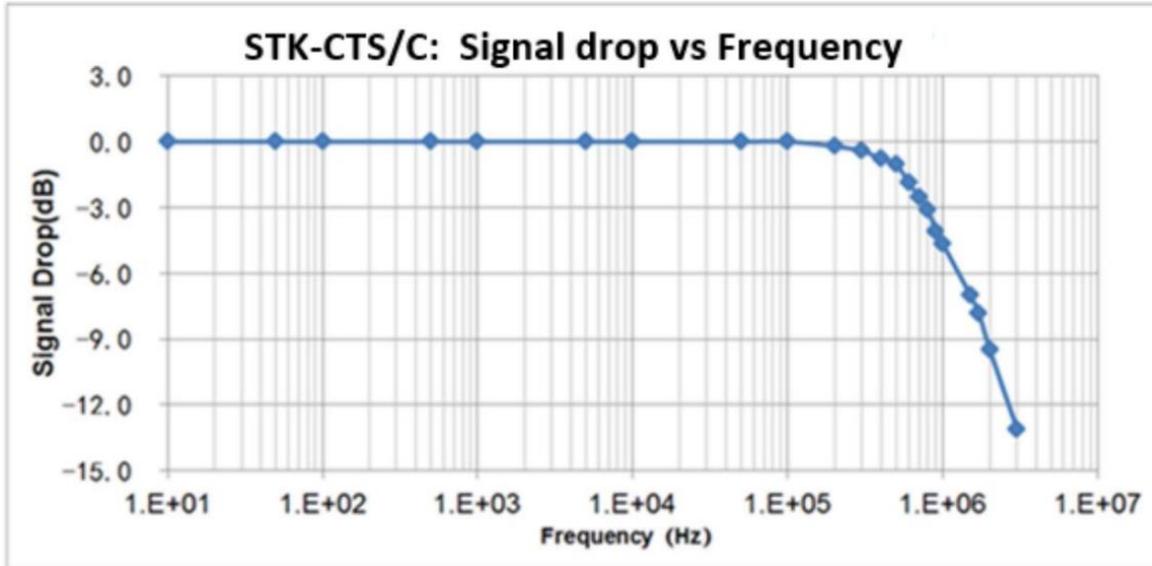
Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary nominal current rms	I_{pn}	A		30		
Primary current measuring range	I_{pm}	A	-60		60	
Supply voltage	V_{cc}	V	4.8	5	5.2	
Consumption current	I_{cc}	mA		5	10	
Full-scale output	V_{FS}	V		± 1.05		$(V_{out} @ \pm I_{pn}) - V_{off}$
Internal reference resistance	R_{ref}	Ω		1		
Internal output resistance	R_{out}	Ω		1		
Reference voltage	V_{ref}	V	2.48	2.5	2.52	Output function
Quiescent voltage $V_{out} @ 0\text{ A}$	V_{off}	V	2.48	2.5	2.52	
Electrical offset voltage	V_{oe}	mV	-20		20	$(V_{out} - V_{ref}) @ 0\text{A}$
Temperature drift of V_{oe}	V_{oe_T} Range	ppm/K	-150		150	$-40^\circ\text{C} \sim 105^\circ\text{C}$
Theoretical gain	G_{th}	mV/A		35		1.05 V @ I_{pn}
Non-linearity	Non-L	% I_{pn}		1		$\pm I_{pn}$
reaction time	t_{ra}	μs		0.75		@10% of I_{pn}
Step response time	t_{res}	μs		1.5		@90% of I_{pn}
Delay time	t_{delay}	μs		1		@300 kHz
-3dB band width	BW	kHz		300		Back-end non-RC circuit
Noise DC ~ 10 kHz DC ~ 100 kHz	V_{noise}	mVpp		15 25		
Accuracy @ RT	X	% of I_{pn}	-1		1	@ 25°C
Accuracy@ $-40^\circ\text{C} \sim 105^\circ\text{C}$	X_{TRange}	% of I_{pn}	-2		2	@ $-40^\circ\text{C} \sim 105^\circ\text{C}$

2.5 STK-50CTS/CD Parameters

 Condition: $V_{cc} = 5.0\text{ V}$, $T_A = 25^\circ\text{C}$, unless specified

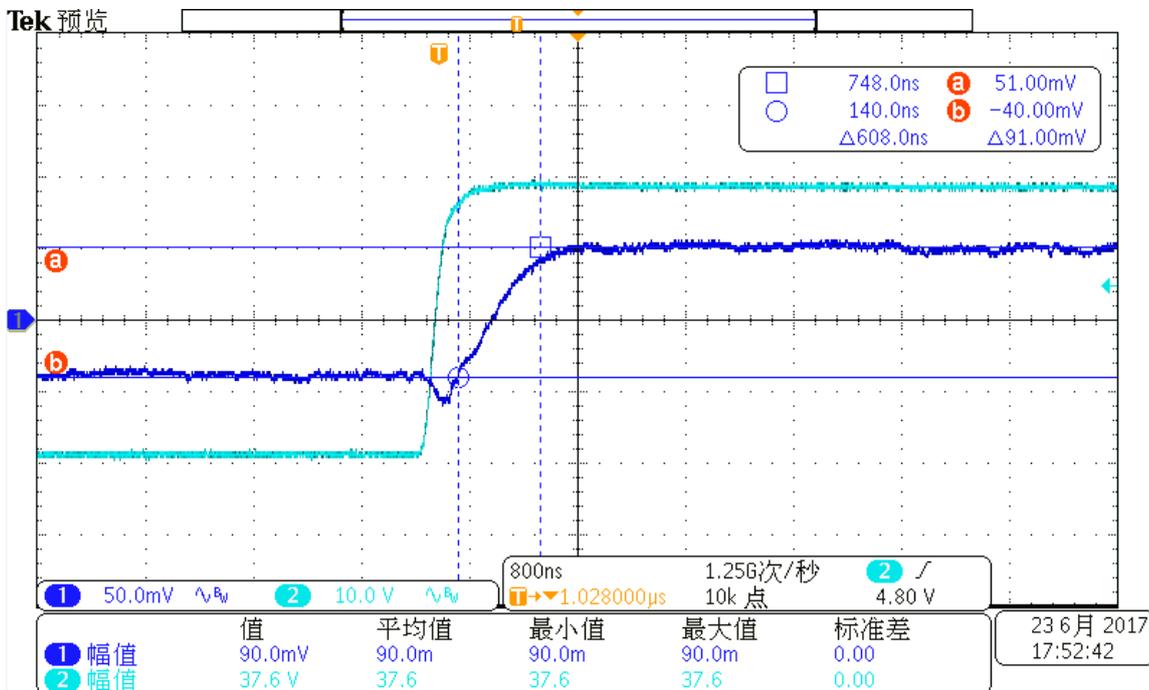
Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary nominal current rms	I_{pn}	A		50		
Supply voltage	V_{cc}	V	4.8	5	5.2	
Consumption current	I_{cc}	mA		5	10	
Full-scale output	V_{FS}	V		± 2		$(V_{out} @ \pm I_{pn}) - V_{off}$
Internal reference resistance	R_{ref}	Ω		1		
Internal output resistance	R_{out}	Ω		1		
Reference voltage	V_{ref}	V	2.48	2.5	2.52	Output function
Quiescent voltage $V_{out} @ 0\text{ A}$	V_{off}	V	2.48	2.5	2.52	
Electrical offset voltage	V_{oe}	mV	-20		20	$(V_{out} - V_{ref}) @ 0\text{A}$
Temperature drift of V_{oe}	V_{oe_T} Range	ppm/K	-150		150	$-40^\circ\text{C} \sim 105^\circ\text{C}$
Theoretical gain	G_{th}	mV/A		40		$2\text{V} @ I_{pn}$
Non-linearity	Non-L	% I_{pn}		1		$\pm I_{pn}$
reaction time	t_{ra}	μs		0.75		@10% of I_{pn}
Step response time	t_{res}	μs		1.5		@90% of I_{pn}
Delay time	t_{delay}	μs		1		@300 kHz
-3dB band width	BW	kHz		300		Back-end non-RC circuit
Noise DC ~ 10 kHz DC ~ 100 kHz	V_{noise}	mVpp		15 25		
Accuracy @ RT	X	% of I_{pn}	-1		1	@ 25°C
Accuracy@ $-40^\circ\text{C} \sim 105^\circ\text{C}$	X_{TRa} range	% of I_{pn}	-2		2	@ $-40^\circ\text{C} \sim 105^\circ\text{C}$

2.6 Frequency band width



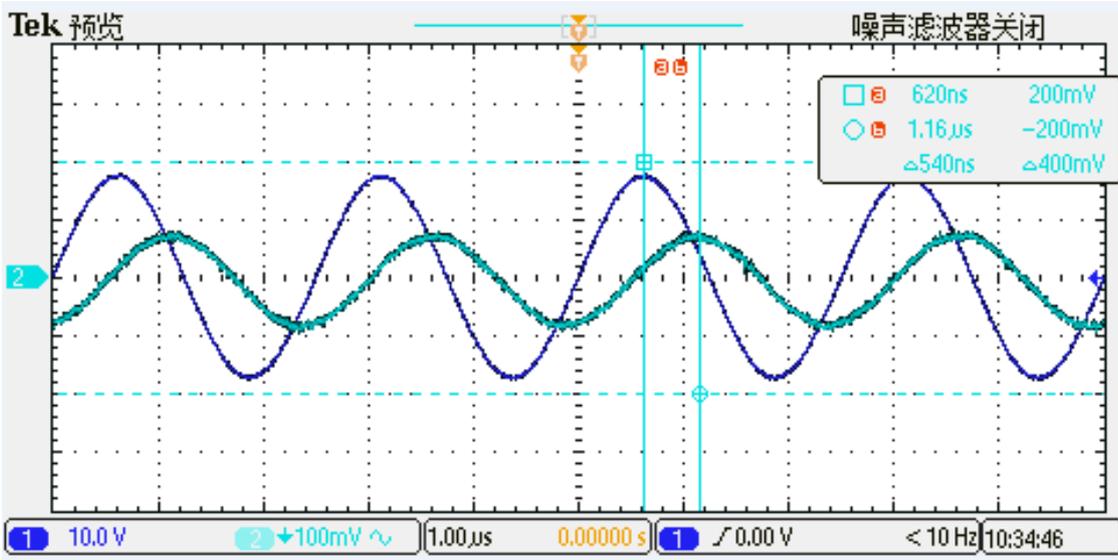
Remark: STK-CTS /CD series current sensor bandwidth. The bandwidth of the sensor is in the range of DC ~ 300 KHZ (- 3db).

2.7 Step response time



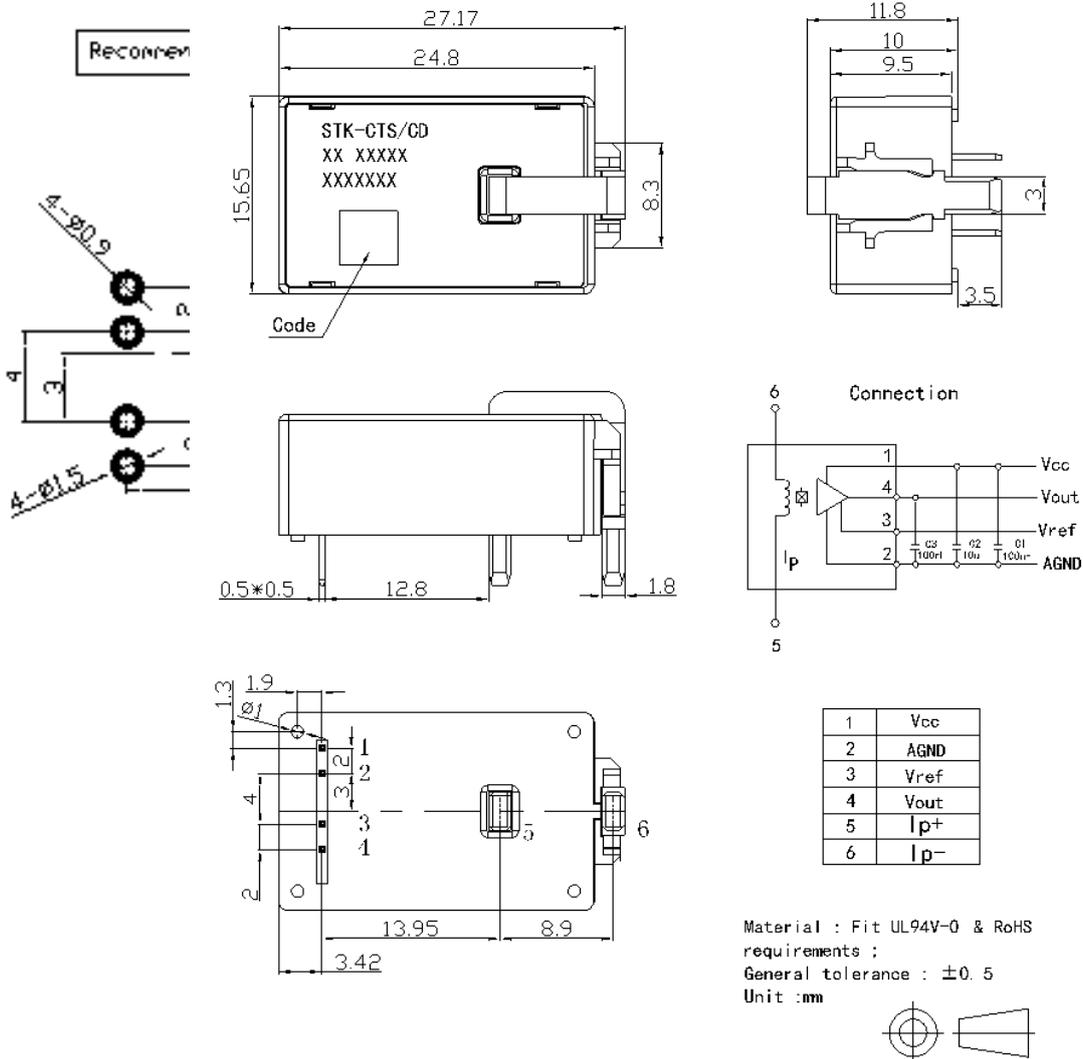
Remark: Step response time of STK-CTS/CD current sensor. The delay from 90% of the original current signal to 90% of the sensor output is less than 1.5 us. .

2.8 Frequency delay performance



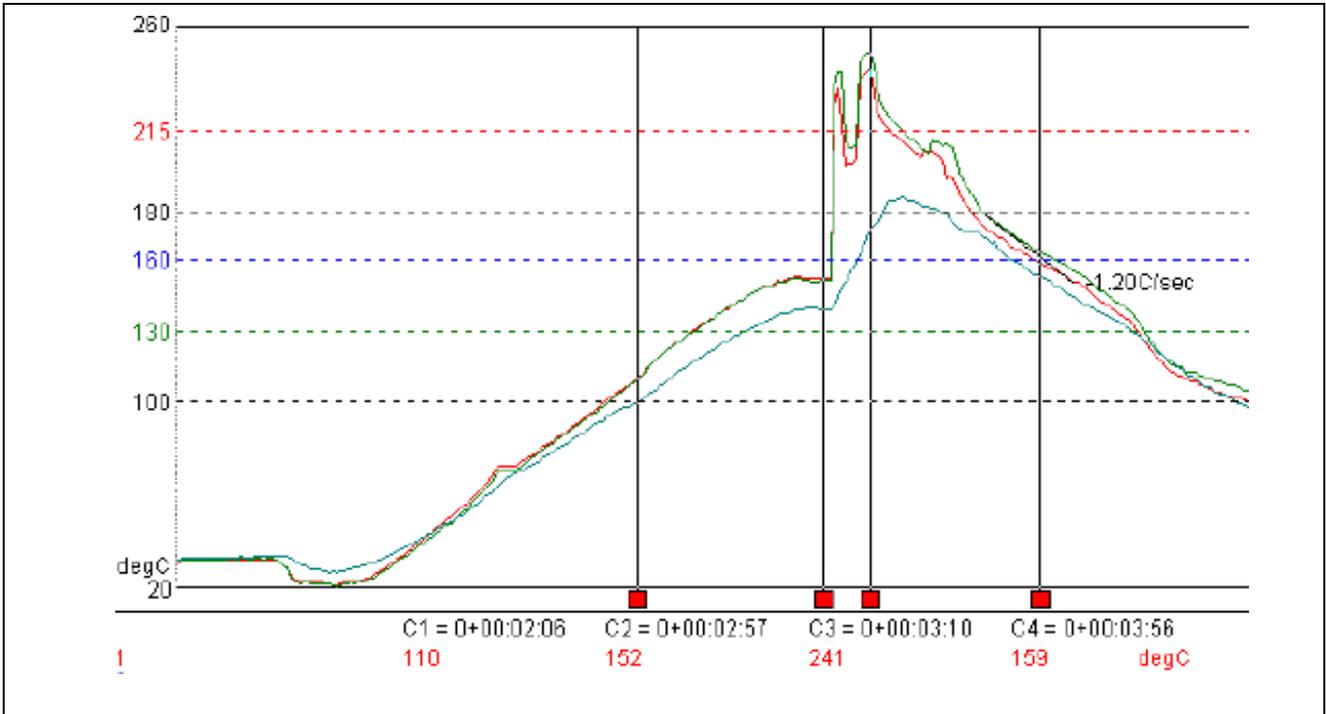
Remark: Primary current was detected at a frequency of 400 kHz. Typical results of stK-CTS /CD current sensor output main current delay characteristics .

3. Size



4. Welding features

4.1 Wave soldering method



Wave soldering temperature: 255°C±5°C; Time: not less than 7 seconds。

Wave soldering preheating temperature: 100°C-160°C; Time: not less than 10 seconds。