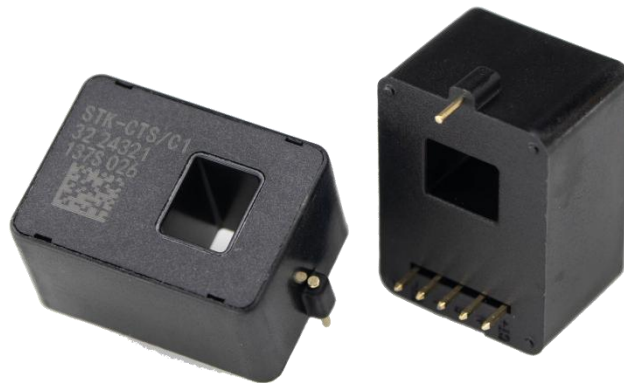


## CURRENT SENSOR

Product series: STK-CTS/C1

Product part number: STK-32CTS/C1, STK-40CTS/C1

Version: V1.8



Sinomags Technology Co., Ltd.

web: [www.sinomags.com](http://www.sinomags.com)

# CONTENTS

1. Description .....	2
2. Conventional current detection function .....	2
2.1 General Parameter .....	2
2.2 Absolute Parameter .....	2
2.3 Isolation parameters .....	2
2.4 STK-32CTS/C1 Parameters .....	3
2.5 STK-40CTS/C1 Parameters .....	4
2.6 Frequency band width .....	5
2.7 Step response time .....	5
2.8 Frequency delay performace .....	6
3. Arccurrent detection function .....	6
3.1 Frequency characteristics .....	6
3.2 Saturation current .....	7
3.3 Sensor specifications .....	7
4. Size .....	8
5. Welding features .....	9
5.1 Wave soldering method .....	9

## 1. Description

STK-CTS/C series products are built with two sets of independent current detection functions, the first is the conventional current detection function, the second is the arc current detection function.

## 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	VC	V	5.5
ESD rating (HBM)	Uesd	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	Ud	kV	4	
Impact voltage 1.2/ 50s	Ūw	kV	6	
Clearance	dCl	mm	> 8	Shortest distance through air
Creepage distance	dCp	mm	> 8	Shortest distance along device body
Case material			V0 according to UL 94	

## 2.4 STK-32CTS/C1 Parameters

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

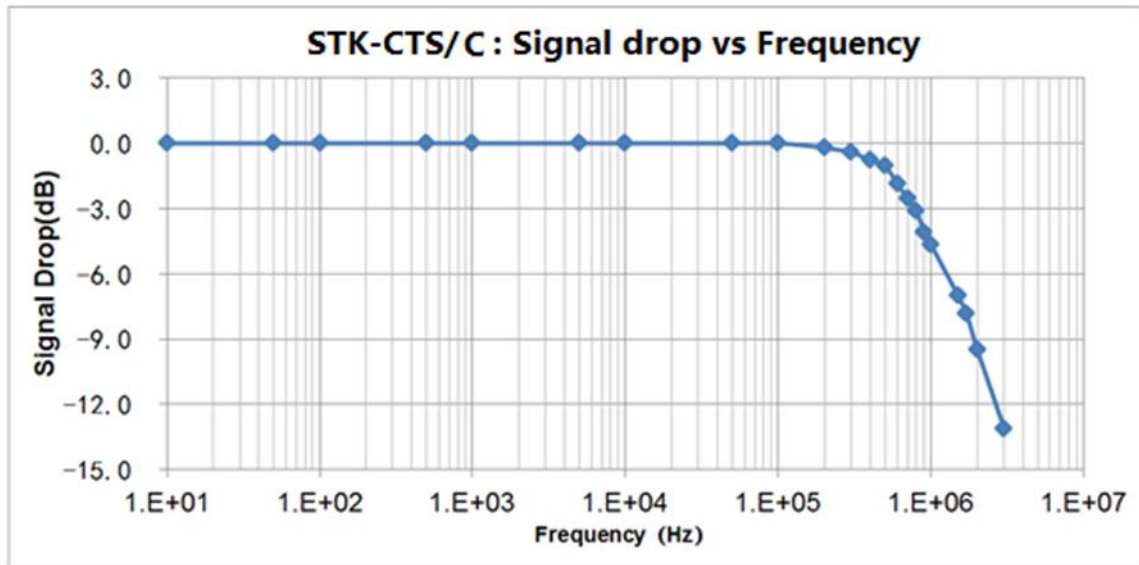
Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary current	$I_{pn}$	A	-12.8		12.8	
Maximum current	$I_{pm}$	A	-32		32	
Supply voltage	$V_{cc}$	V	4.75	5	5.25	
Consumption current	$I_{cc}$	mA		5	10	
Full-scale output	$V_{FS}$	V		$\pm 0.8$		$(V_{out} @ \pm I_{pn}) - V_{off}$
Output resistance	$R_{out}$	$\Omega$		1		@ $V_{out}$
Offset voltage	$V_{off}$	V	2.48	2.5	2.52	$V_{out} @ 0\text{ A}$
Theoretical gain	$G_{th}$	mV/A		62.5		2 V @ $I_{pn}$
Non-linearity	Non-L	% $I_{pn}$		0.5		$\pm I_{pn}$
reaction time	$t_{ra}$	$\mu\text{s}$		0.5		@10% of $I_{PN}$
Step response time	$t_{res}$	$\mu\text{s}$		1		@90% of $I_{PN}$
Delay time	$t_{delay}$	$\mu\text{s}$		1		@400 kHz
-3dB band width	BW	kHz		400		Back-end non-RC circuit
Noise 1Hz~ 10 kHz	$V_{noise}$	mVpp		15 25		
Accuracy @ RT	X	% of $I_{pn}$	-1		1	@ $25^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.128\text{A}$
Accuracy@-40 $^\circ\text{C} \sim 85^\circ\text{C}$	$X_{TRange}$	% of $I_{pn}$	-2		2	@-40 $^\circ\text{C} \sim 85^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.256\text{A}$
Accuracy@85 $^\circ\text{C}$ $\sim 105^\circ\text{C}$	$X_{TRange}$	% of $I_{pn}$	-3		3	@ $85^\circ\text{C} \sim 105^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.512\text{A}$

## 2.5 STK-40CTS/C1 Parameters

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

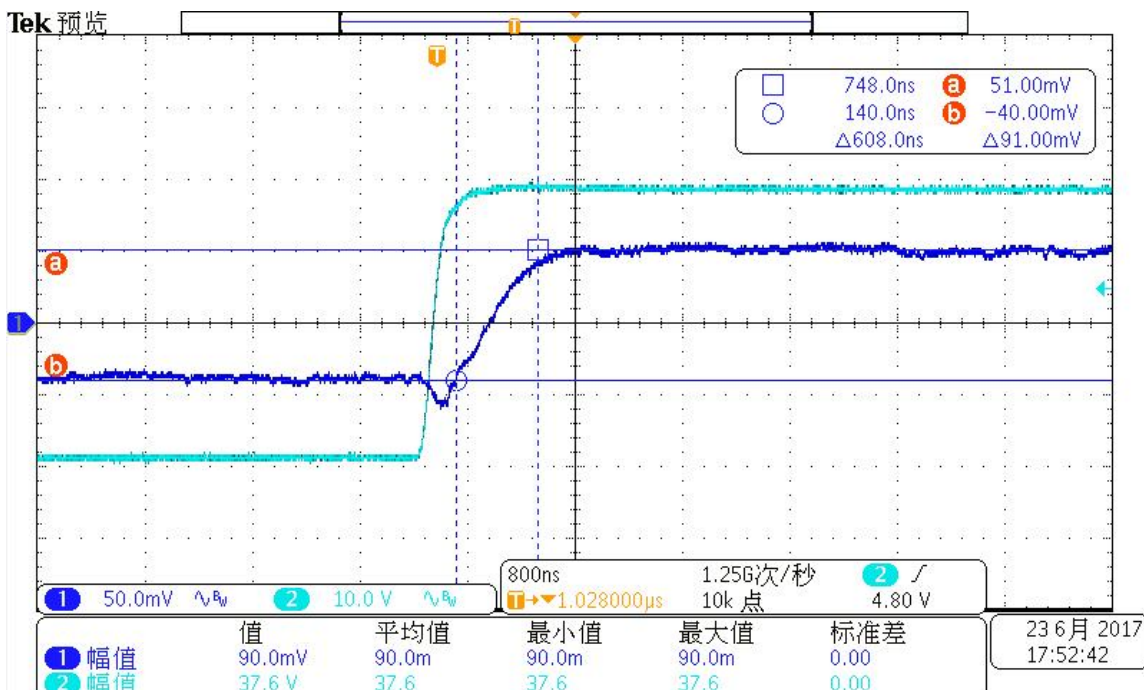
Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary current	$I_{pn}$	A	-16		16	
Maximum current	$I_{pm}$	A	-40		40	
Supply voltage	$V_{cc}$	V	4.75	5	5.25	
Consumption current	$I_{cc}$	mA		5	10	
Full-scale output	$V_{FS}$	V		$\pm 0.8$		$(V_{out} @ \pm I_{pn}) - V_{off}$
Output resistance	$R_{out}$	$\Omega$		1		@ $V_{out}$
Offset voltage	$V_{off}$	V	2.48	2.5	2.52	$V_{out} @ 0\text{ A}$
Theoretical gain	$G_{th}$	mV/A		50		2 V @ $I_{pn}$
Non-linearity	Non-L	% $I_{pn}$		0.5		$\pm I_{pn}$
reaction time	$t_{ra}$	$\mu\text{s}$		0.5		@10% of $I_{PN}$
Step response time	$t_{res}$	$\mu\text{s}$		1		@90% of $I_{PN}$
Delay time	$t_{delay}$	$\mu\text{s}$		1		@400 kHz
-3dB band width	BW	kHz		400		Back-end non-RC circuit
Noise 1Hz~ 10 kHz	$V_{noise}$	mVpp		15 25		
Accuracy @ RT	X	% of $I_{pn}$	-1		1	@ $25^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.16\text{A}$
Accuracy@-40 $^\circ\text{C} \sim 85^\circ\text{C}$	$X_{TRange}$	% of $I_{pn}$	-2		2	@-40 $^\circ\text{C} \sim 85^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.32\text{A}$
Accuracy@85 $^\circ\text{C}$ $\sim 105^\circ\text{C}$	$X_{TRange}$	% of $I_{pn}$	-3		3	@ $85^\circ\text{C} \sim 105^\circ\text{C}$ $\Delta I (\text{max}) \leq 0.64\text{A}$

## 2.6 Frequency band width



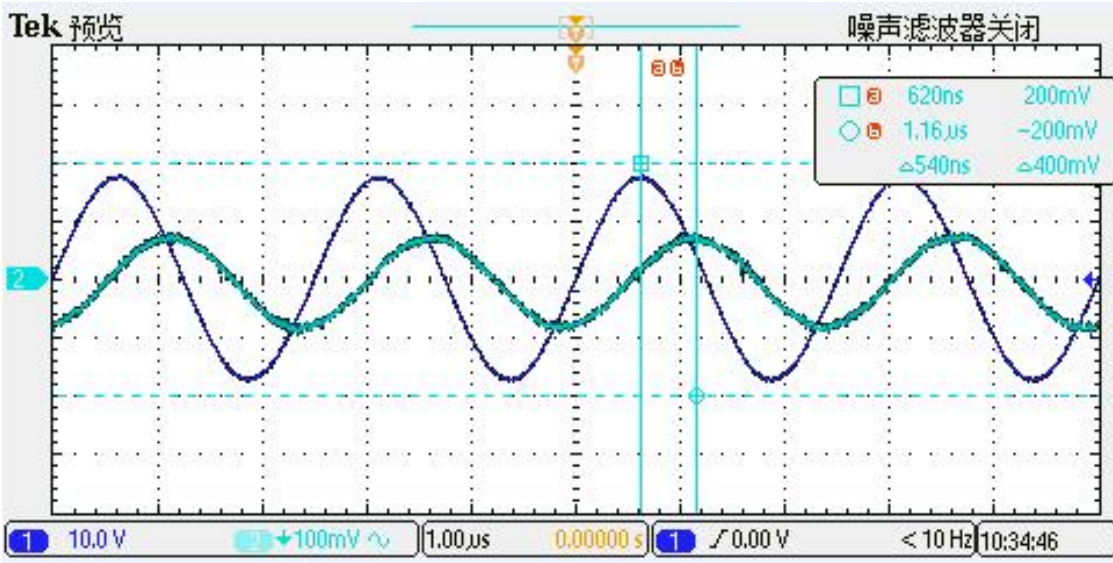
Remark: STK-CTS /C series current sensor bandwidth. The bandwidth of the sensor is in the range of DC ~ 400 KHZ (-3db).

## 2.7 Step response time



Remark: Step response time of STK-CTS/C current sensor. The delay from 90% of the original current signal to 90% of the sensor output is less than 1 us. .

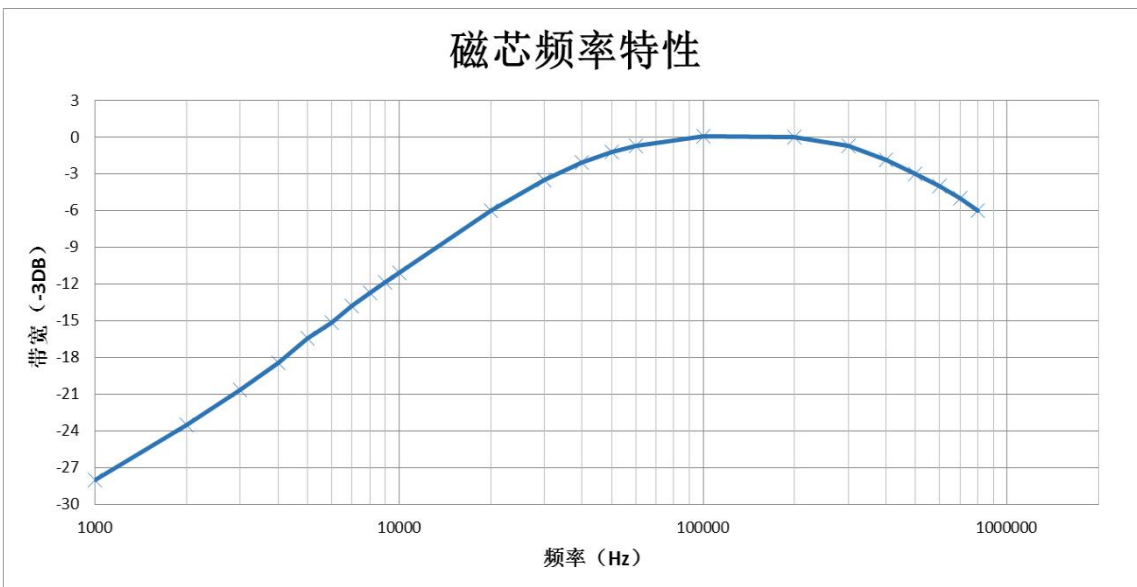
## 2.8 Frequency delay performance



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

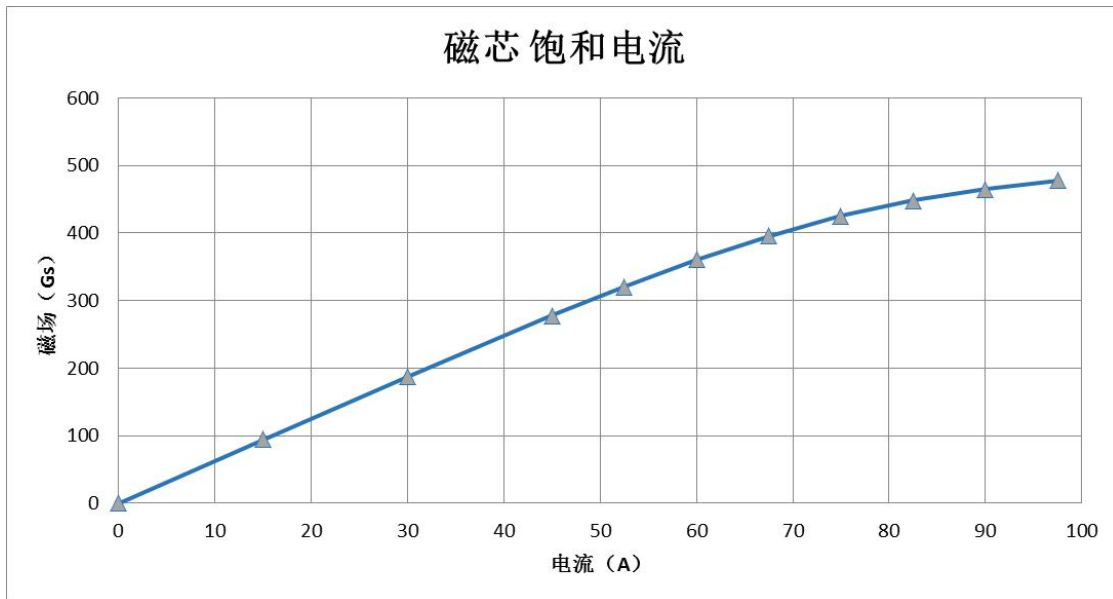
## 3. Arccurrent detection function

### 3.1 Frequency characteristics



Test conditions: the current at the primary side is 10 mA, the sampling resistance is 100 ohm, and the amplification is 150 times. The output at both ends of the test resistance varies with the current frequency at the primary side. The cut-off frequency is calculated according to the volt frequency characteristics.

### 3.2 Saturation current



Test conditions: Gauss meter is used to test the open-gap magnetic field of the core varying with current.

### 3.3 Sensor specifications

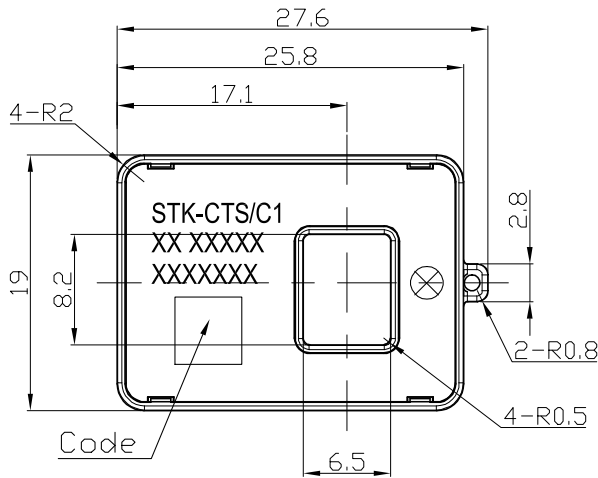
Parameter	Measure	Min	Typ	Max	Unit
inductance	L (5-6)	590	670	750	$\mu$ H
Q	Q (5-6)	/	/	/	/
resistance	R (5-6)	0.4	0.7	1	$\Omega$
Turns ratio test	N (5-6)	/	100	/	TS
Insulation voltage 50Hz, 1 min	(5-6)	/	4000	/	V
High frequency cut-off frequency (-3db)	fH	400	/	/	kHz
Low frequency cut-off frequency (-3db)	fL	/	/	35	kHz
Saturation current	Bs	40	45	50	A
The clearance	初级对次级	/	/	/	/
Creepage distance	初级对次级	/	>8	/	mm
Wire level	F 级				

Test conditions: 1. Inductance test frequency 100 HZ, voltage 1 V.

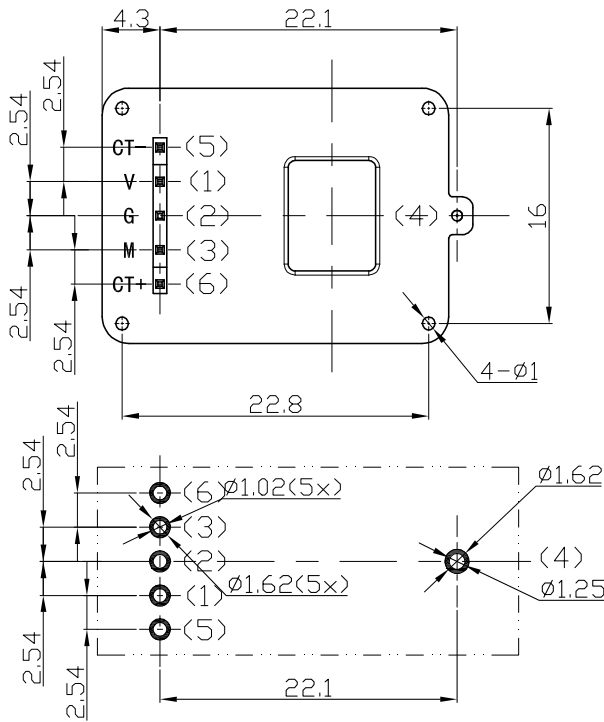
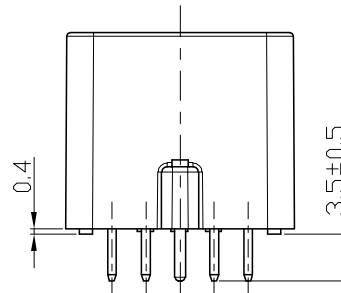
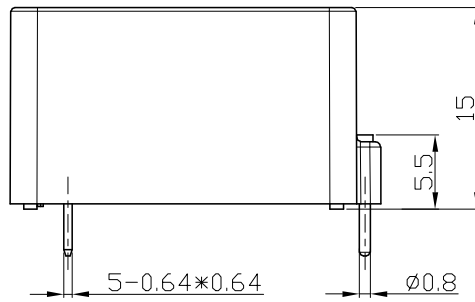
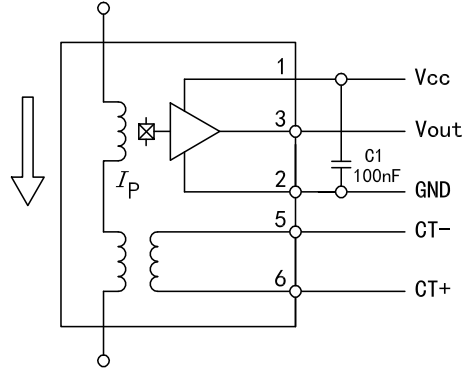
2. Subtract the internal resistance of the multimeter for resistance test.



### 4. Size



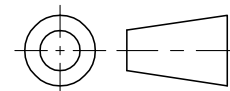
### Connection



### Terminals

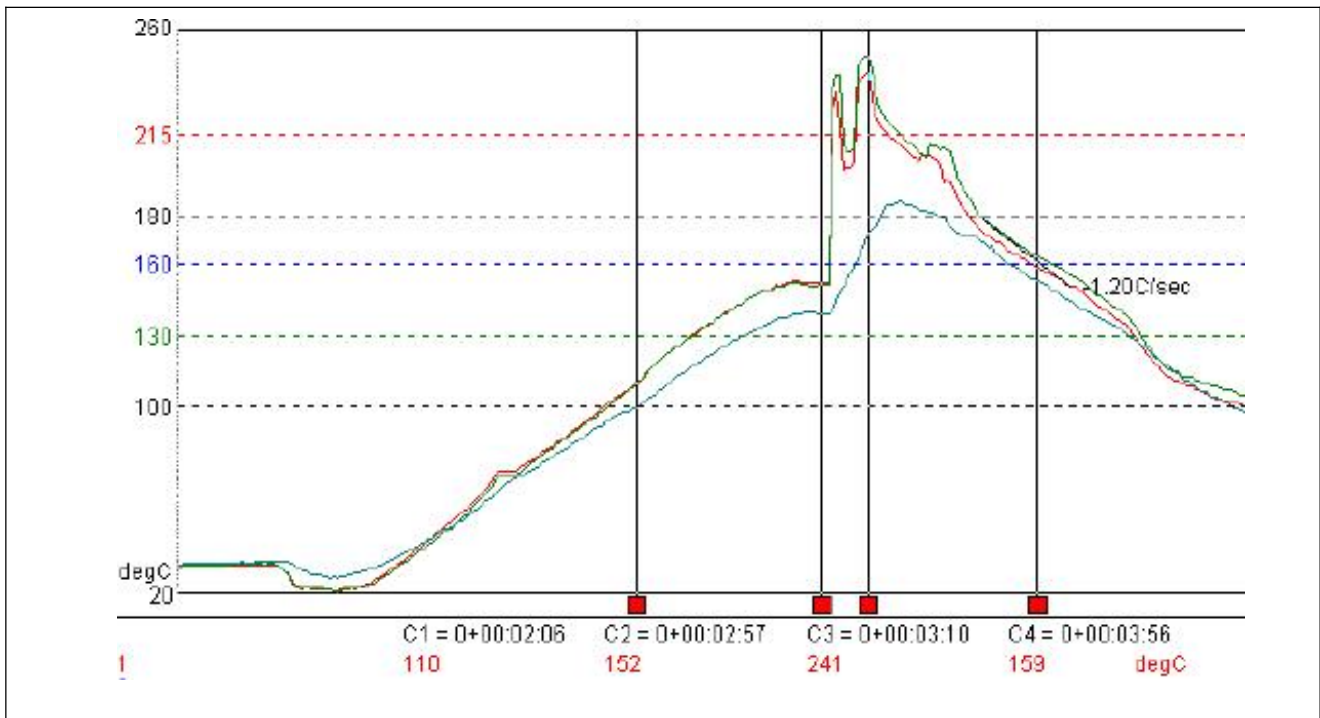
(1)	Vcc
(2)	GND
(3)	Vout
(4)	NULL
(5)	CT-
(6)	CT+

Material : Fit UL94V-0 & RoHS requirements ;  
General tolerance :  $\pm 0.5$   
Unit : mm



## 5. Welding features

### 5.1 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。