CURRENT SENSOR

PRODUCT SERIES: STK-HO-P, STK-HO-TP

PRODUCT PARNUMBER:

STK-50HO-P, STK-100HO-P STK-50HO-TP, STK-100HO-TP

STK-150HO-P,STK-200HO-P STK-150HO-TP

STK-400HO-P

REVISION: Ver 1.0

Sinomags Technology Co., Ltd.

Web site: www.sinomags.com

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1. Description

STK-HO-P & TP current sensor are based on the open loop principle. DC, AC, pulses and any kind of irregular wave can be measured by the current sensor under the isolated conditions.

Typical application

- AC Variable speed drives
- Power supplies for welding applications
- Switched model power supplies (SMPS)
- Battery supplied applications
- UPS
- Static converters for DC motor drives

General parameters

Parameter	Symbol	Unit	Value
Working temperature	T_a	C°	-40 ~ 105
Storage temperature	T_stg	C°	-40 ~ 105
Mass (in brackets: TP version)	m	g	20 (28)

Absolute parameters

Parameters	Symbol	Unit	Value
Supply voltage (not-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 parameters

Parameter	Symbol	Unit	Value	Remark
RMS voltage for AC test	Ud	kV	4.3	@ 50Hz/1 min
Impulse withstand voltage	Ûw	kV	8	1.2/50μs
Case material	-	-	V0	According to UL 94
Comparative tracking index	CTI	-	600	
Clearance (pri. - sec.)	D_ci	mm	>8	Shortest distance through air
Creepage distance (pri. - sec.)	D_cp	mm	>8	When mounted on PCB with recommended layout

2. Electrical data

Primary nominal rms current IPN (A)	Primary current measuring rang IPM (A)	Theoretical gain (mV/A)	Type
50	±150	12.5	STK-50HO-P&TP
100	±300	6.25	STK-100HO-P&TP
150	±450	4.17	STK-150HO-P&TP
200	±600	3.125	STK-200HO-P
400	±600	1.56	STK-400HO-P

Remarks : -TP version is equipped with a primary bus bar; Temperature of primary bus bar should not exceed 100 °C

3. Electrical performance of STK-xxHO-P&TP

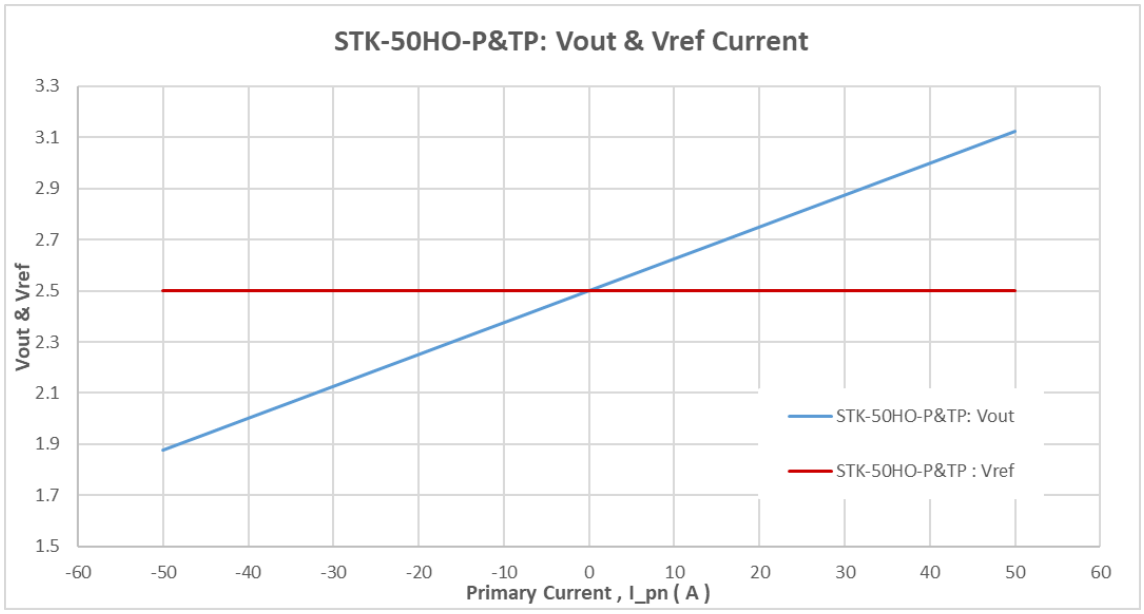
Vcc = 5 V, T_A = 25C°

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Supply voltage	Vcc	V	4.75	5	5.25	
Current consumption	Icc	mA		6	10	
Reference voltage (output)	Vref	V	2.48	2.5	2.52	Output function
Electrical offset voltage @ I P = 0 A	Voe	mV	-8		8	Vout – Vref @ Vref = 2.5 V
Internal Vref resistance	R_ref	Ω		10		Series
Internal output resistance	R_out	Ω		10		Series
Difference of output resistance (R_ref – R_out)	Roe	Ω	-5		5	Series
Temperature drift of Voe	Voe_TRange	mV	-15		15	-40C° ~ 105C°
Error of gain	Err_G	%G_th	-1		1	Trimmed in the factory @ 25C°
Temperature drift of gain	G_TR	%G_th	-3		3	@ -40C°~105C°
Rated linearity error	Non-L_pn	%I_pn	-0.5		0.5	Within ±I_pn
Step response time	t_res	μs		5		@ 90% of I_pn
Frequency bandwidth (-3dB)	BW	kHz		50		No RC circuit
Output voltage noise	Vnoise	mVpp		4.4		@140kHz Sampling Rate
Accuracy @ 25C°	X	% of I_pn	-1.5		1.5	@ 25C°
Accuracy @ -40C°~105C° ①	X_TRange	% of I_pn	-3		3	-40C° ~ 105C°

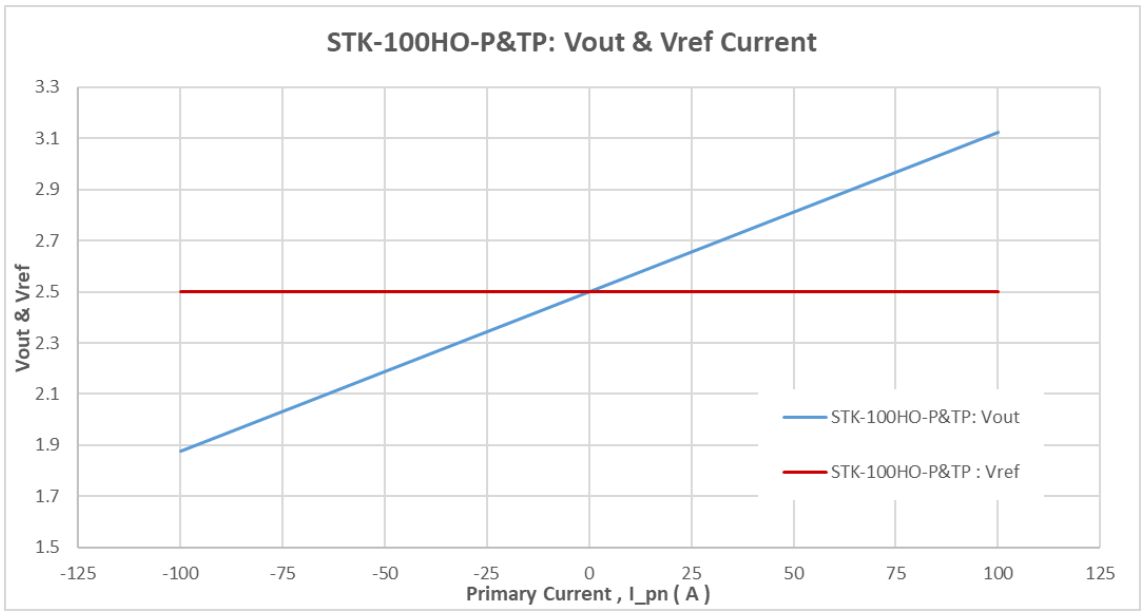
Remarks：

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

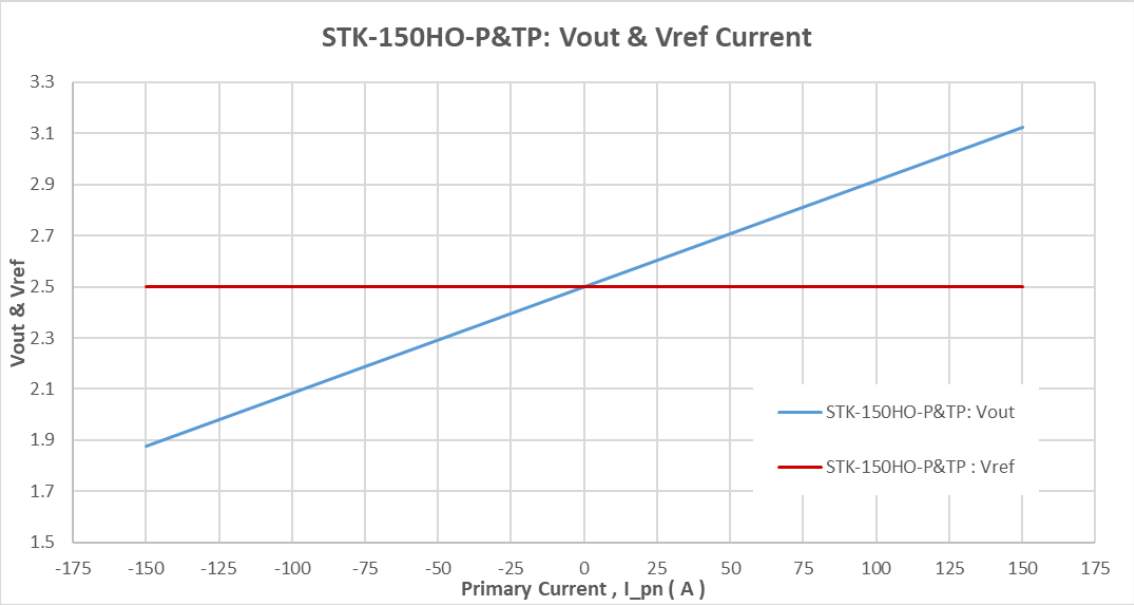
4. Output voltage VS primary current of STK-xxHO-P&TP



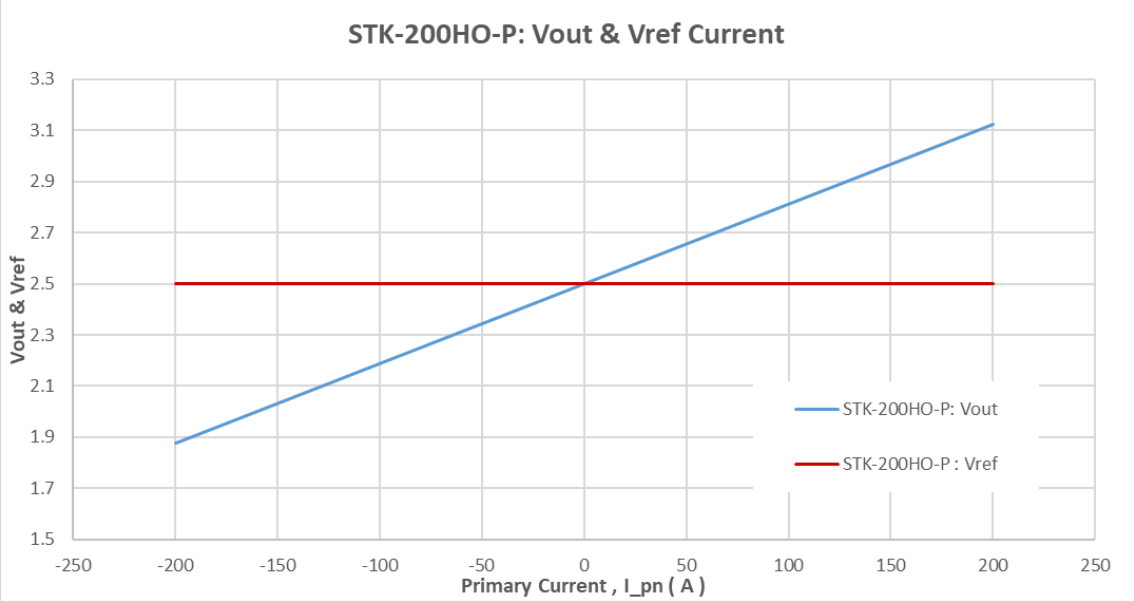
The dependence of Vout & Vref of STK-50HO-P&TP on the primary current.



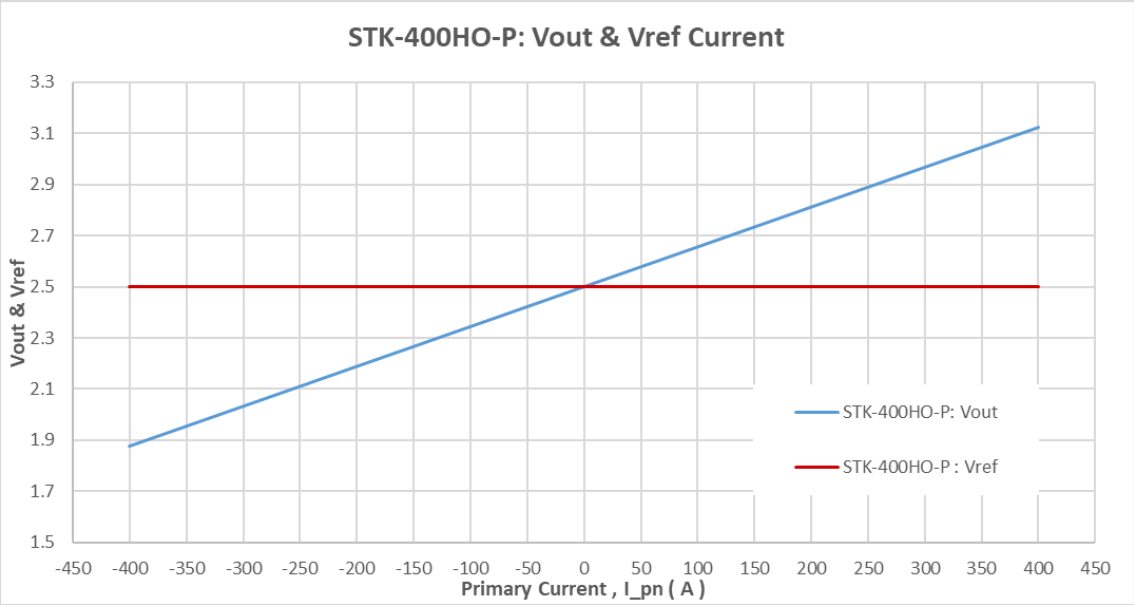
The dependence of Vout & Vref of STK-100HO-P&TP on the primary current.



The dependence of Vout & Vref of STK-150HO-P&TP on the primary current.

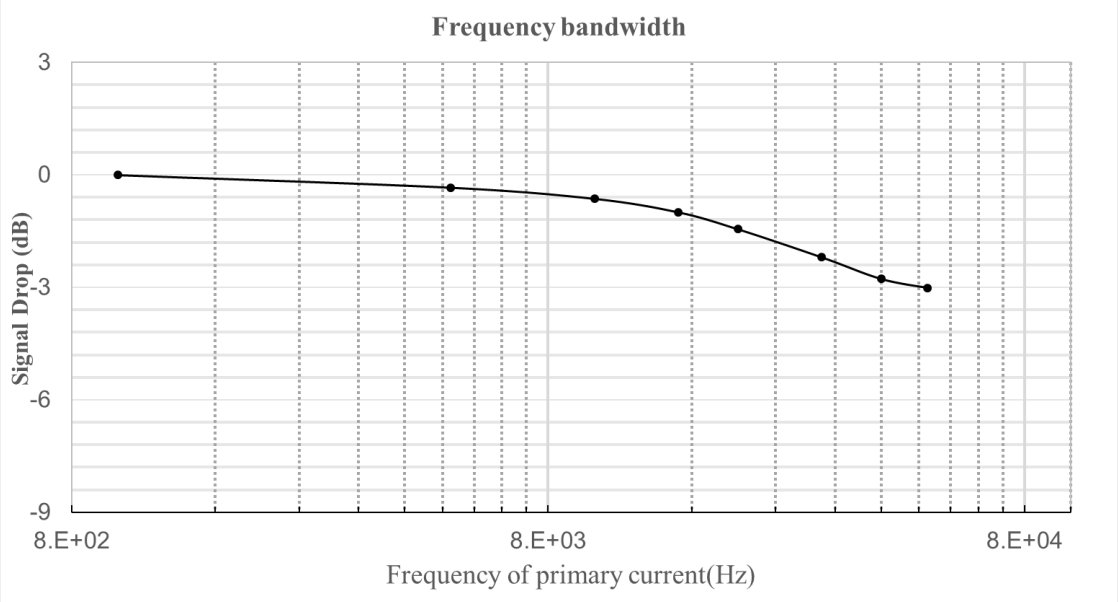


The dependence of Vout & Vref of STK-200HO-P on the primary current.



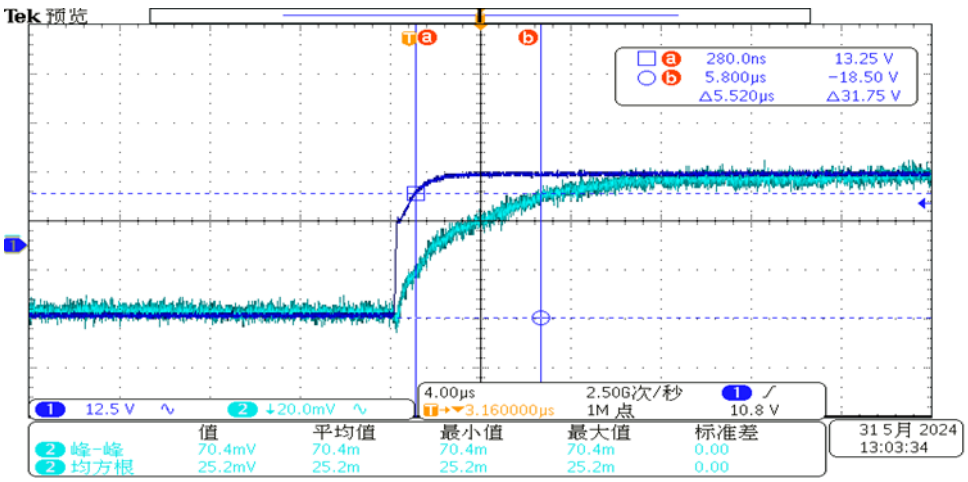
The dependence of Vout & Vref of STK-400HO-P on the primary current.

5. Frequency bandwidth



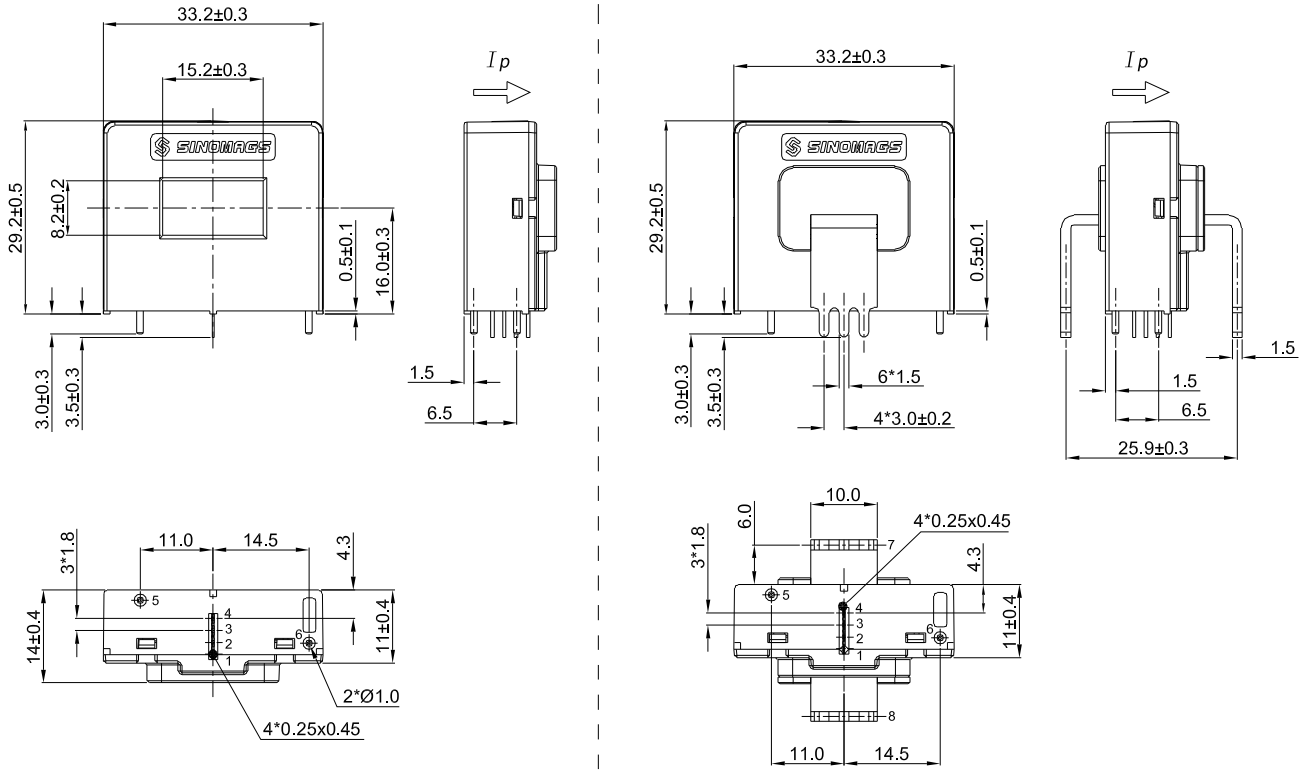
The frequency band width of STK-xxHO-P&TP series current sensors.

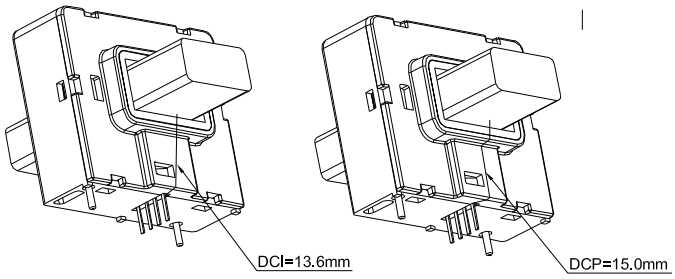
6. Step response time

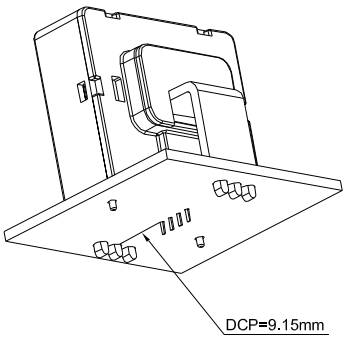


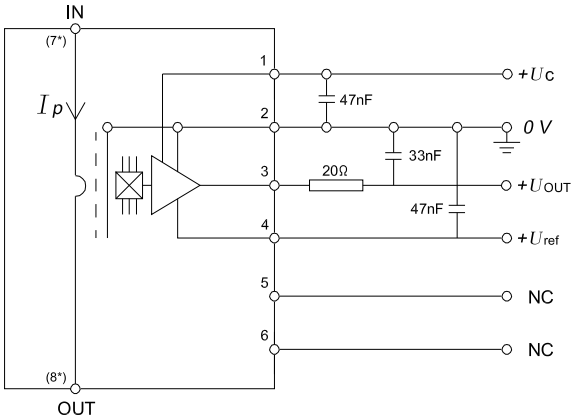
The step response time of STK-HO-xxP&TP current sensors. The dark light blue is primary current, while the light blue is output signal of current sensor. The step response time is about 5 µs.

7. Dimensions & Pins & Footprint









Recommended PCB hole sizes:
1.Primary bus bar pins 7 and 8 PCB hole 2.3±0.1mm
（for TP versions only）
2.Secondary pins 1-4 PCB hole 0.7±0.1mm
3.Support pins 5 and 6 PCB hole 1.5±0.1mm

Mechanical characteristics:
1.General tolerance： ±0.2mm.
2.Primary through-hole： 15.2mm x 8.2mm
3.Material : Fit UL94V-0 & RoHS requirements ;
Unit :mm