

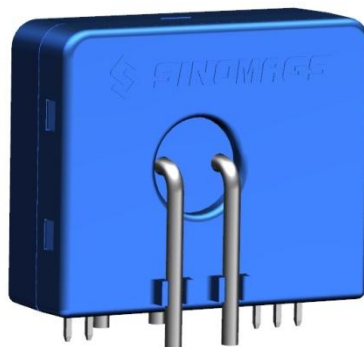
## CURRENT SENSOR

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PRODUCT SERIES: STK-P

PRODUCT PART NUMBER: STK-1.0P/P1S

REVISION: Ver 1.5



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## 1. Description

### Features

- Open loop current transducer
- Voltage output
- Insulation voltage for 5kV/AC
- Single supply voltage
- PCB mounting.

### Applications

- Residual current measurement
- Leakage current measurement in transformerless PV inverters
- First human contact protection of PV arrays
- Failure detection in power sources
- Leakage current detection in stacked DC sources
- Communication power
- Single phase or three phase nominal current measurement of  $\pm 20$  A per wire

### Advantages

- High accuracy
- High overload capability
- High insulation capability
- High separation ability
- Low temperature drift
- Degauss and test functions.

### Standards

- EN 50178
- IEC 61326-1: 2012

### Application Domain

- Industry.

## 2. Absolute parameter

### Absolute maximum ratings

Parameter	Symbol	Unit	Value
Supply voltage	V <sub>c</sub>	V	6
Primary conductor temperature		°C	110
Overload capability (100 μs, 500 A/μs)		A	3300

Stresses above these ratings may cause permanent damage. Exposure to absolute maximum ratings for extended periods may degrade reliability.

### Isolation parameters

Parameter	Symbol	Unit	Value	Remark
RMS voltage for AC test 50Hz/1 min	V <sub>d</sub>	kV	5	
Impulse withstand voltage 1.2/50μs	V <sub>w</sub>	kV	10.1	
Comparative tracking index	CTI	V	600	
Clearance distance (pri. –pri.)	d <sub>Cl</sub>	mm	5	Shortest distance through air
Creepage distance (pri. –pri.)	d <sub>Cp</sub>	mm	5.5	Shortest path along device body
Clearance distance (pri. –sec.)	d <sub>Cl</sub>	mm	6	Shortest distance through air
Creepage distance (pri. –sec.)	d <sub>Cp</sub>	mm	6	Shortest path along device body
Case material			V0 according to UL 94	

### Environmental and mechanical characteristics

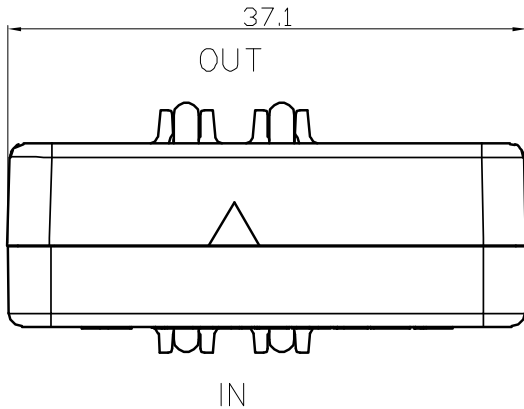
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T <sub>A</sub>	°C	-40		105	
Ambient storage temperature	T <sub>S</sub>	°C	-40		105	
Mass	m	g		40		
standard	EN 50178, IEC 61010-1, UL 508					

### 3. Electrical data

At  $T_A = 25^\circ\text{C}$ ,  $V_C = 5\text{ V}$ .

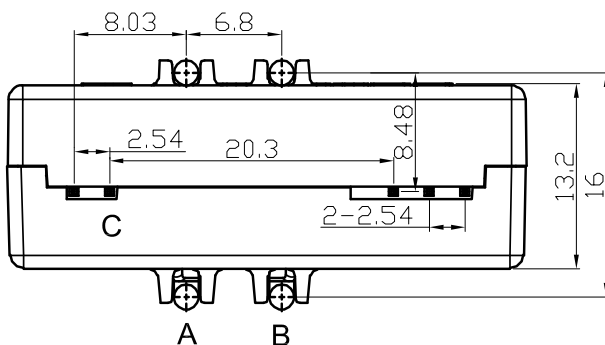
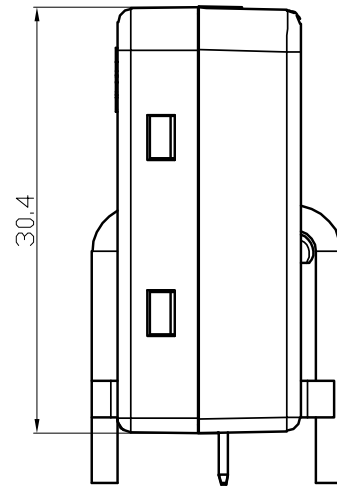
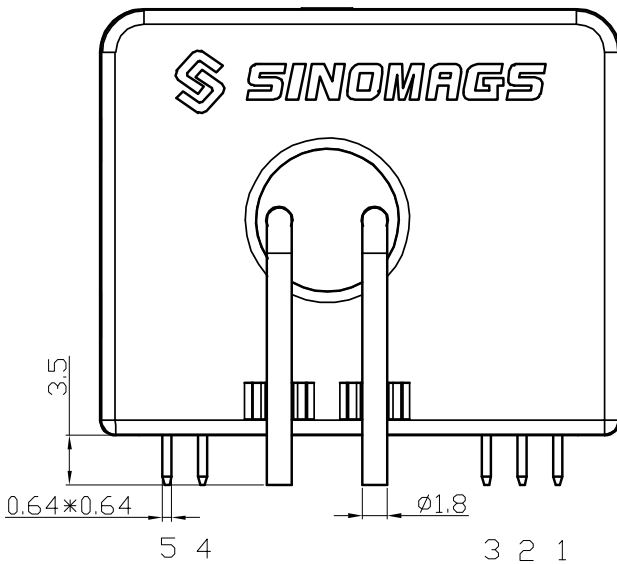
Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal residual rms current	$I_{pn}$	A		1		
Primary residual current, measuring range	$I_{pm}$	A	-1.7		1.7	
Supply voltage	$V_C$	V	4.75	5	5.25	
Current consumption	$I_C$	mA		6	10	
Reference voltage @ $I_P = 0$	$V_{ref}$	V	2.48	2.5	2.52	Internal reference
Electrical offset voltage	$V_{oe}$	mV	-25		25	$(V_{out} - V_{ref})$ @ 0 A
Temperature coefficient of $V_{OE}$ @ $I_P = 0\text{ A}$	$TCV_{oe}$	ppm/K		570		ppm/K of 2.5 V -40 ... 105 °C
Theoretical sensitivity	$G_{th}$	V/A		1.2		
Sensitivity error	$\epsilon_G$	%	-1.6	0.5	1.6	$R_L > 500\text{ k}\Omega$
Temperature coefficient of G	TCG	ppm/K		$\pm 400$		- 40°C ..105°C
Linearity error	$\epsilon_L$	%		0.5	1	
Check current	$I_{CK}$	mA	156	166	176	$\pm 10\text{mA}$
Output voltage(Checkfunction)	$V_{CK}$	V	$V_{oe} + 0.188$	$V_{oe} + 0.2$	$V_{oe} + 0.212$	
Check enable voltage	$V_{CE}$	V	3.3		$V_C$	
Check disabled voltage	$V_{CD}$	V		< 0.2		
Reaction time @ 10 % of $I_{PRN}$	$t_{ra}$	$\mu\text{s}$		10		$R_L > 500\text{ k}\Omega$ , $di/dt > 5\text{ A}/\mu\text{s}$
Step response time to 90 % of $I_{PN}$	$t_r$	$\mu\text{s}$		40		$R_L > 500\text{ k}\Omega$ , $di/dt > 5\text{ A}/\mu\text{s}$
Frequency bandwidth (-3dB)	BW	kHz		15		$R_L > 500\text{ k}\Omega$
Noise(1 Hz ~ 10 kHz)	$V_{no}$	mV rms		10		$R_L > 500\text{ k}\Omega$
Accuracy @ $I_{PN}$ @ $T_A = 25^\circ\text{C}$	$X_{25^\circ\text{C}}$	% of $I_{PN}$		$\pm 2$		
Accuracy @ $I_{PN}$ @ $T_A = 105^\circ\text{C}$	$X_{105^\circ\text{C}}$	% of $I_{PN}$		$\pm 5$		

#### 4. Dimensions (in mm)



#### Terminals

1	Vout
2	CHK
3	GND
4	Vcc
5	Vref



	D <sub>CI</sub>	D <sub>CP</sub>
A-B	5	5.5
A-C	8	--
A-D	--	9

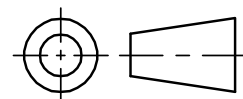
D is secondary inside the transducer

On the customer's PCBA		
	D <sub>CI</sub>	D <sub>CP</sub>
A-B	2.3	2.3
A-C	6	6

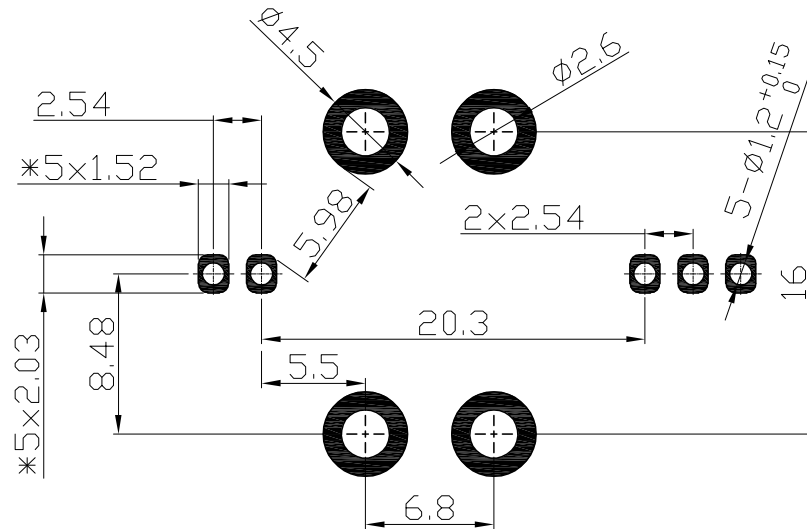
Material : Fit UL94V-0 & RoHS requirements ;

General tolerance :  $\pm 0.2$

Unit :mm



## 5. Assembly on PCB



### Top side view

- Maximum PCB thickness 2.4 mm
- Wave-soldering: 260°C @ 10 s
- Recommended PCB hole diameter 1.2 mm for secondary pin