

## Current Sensor

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Product Series: STK-LBS/6G

Part number: STK-100LBS/6G & STK-200LBS/6G  
STK-300LBS/6G & STK-400LBS/6G  
STK-500LBS/6G & STK-600LBS/6G  
STK-700LBS/6G & STK-800LBS/6G  
STK-900LBS/6G & STK-1000LBS/6G

Version: Ver 2.7



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## 1. Introduction

The STK-LBS6 series current sensor is based on TMR (tunnel magnetoresistance) technology, and it has an open-loop design. It is suitable for DC, AC pulsed and any kind of irregular current measurement under the isolated conditions.

The STK-LBS6 current sensor is designed to measure the current of a conductive rod, which is inserted through the sensor.

### Typical applications

- AC Variable speed drives
- Motor driver

### General parameter

| Parameter           | Symbol           | Unit | Value     |
|---------------------|------------------|------|-----------|
| Working temperature | T <sub>A</sub>   | °C   | -40 ~ 105 |
| Storage temperature | T <sub>stg</sub> | °C   | -40 ~ 125 |
| Mass                | m                | g    | 10        |

### Absolute maximum rating

| Parameter                           | Symbol           | Unit | Value |
|-------------------------------------|------------------|------|-------|
| Supply voltage<br>(not-destructive) | V <sub>C</sub>   | V    | 6     |
| ESD rating (HBM)                    | U <sub>ESD</sub> | 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 parameter

| Parameter                          | Symbol         | Unit | Value | Comment                   |
|------------------------------------|----------------|------|-------|---------------------------|
| RMS voltage for AC test 50Hz/1 min | U <sub>d</sub> | kV   | 0.5   | Dependent on installation |

## 2. Electrical Data

 Condition:  $T_A = 25^\circ\text{C}$ ,  $V_{cc} = 5\text{V}$ 

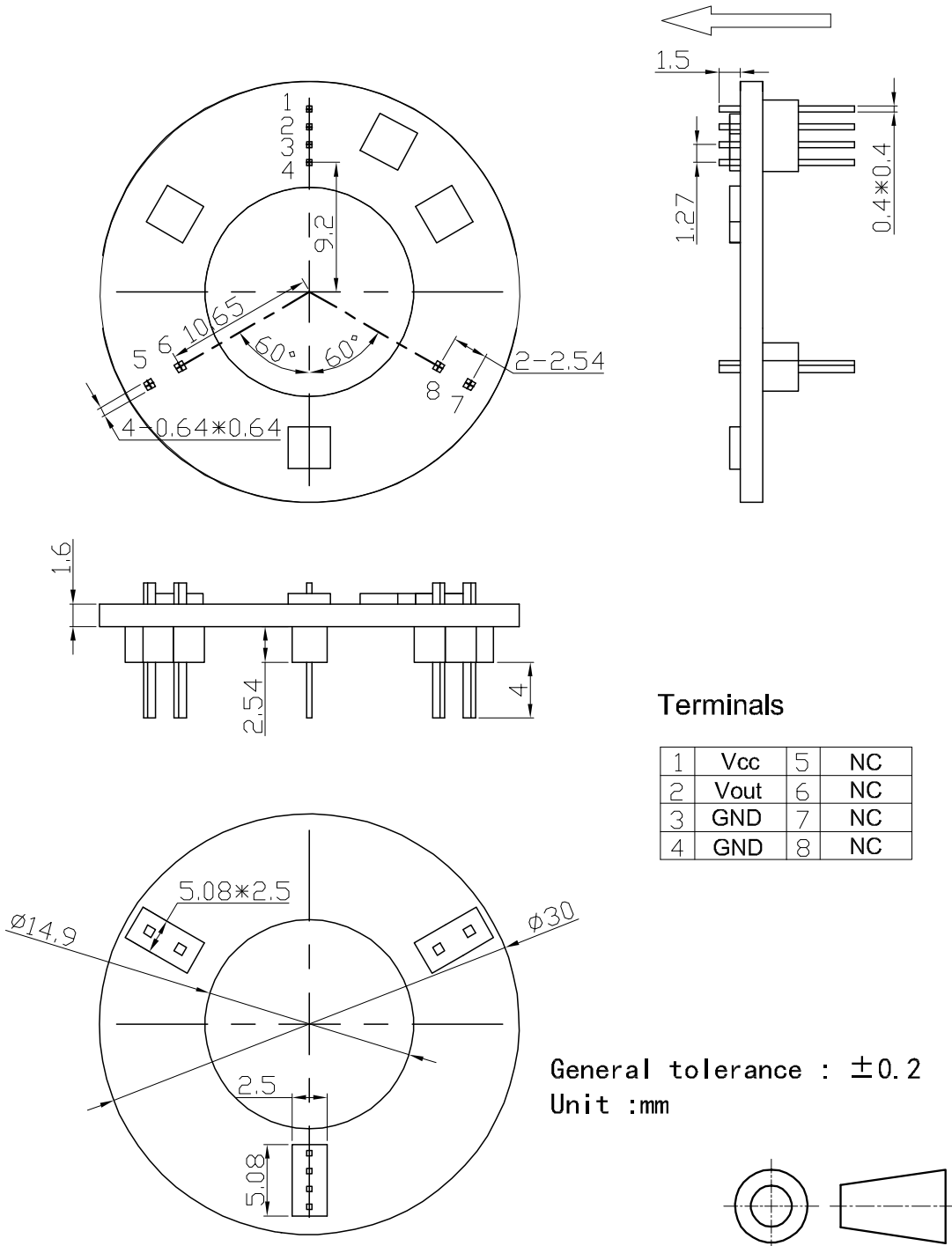
| Parameter                           | Symbol      | Unit          | Min   | Typ         | Max  | Comment                            |
|-------------------------------------|-------------|---------------|-------|-------------|------|------------------------------------|
| Primary current range               | $I_{PM}$    | A             | -100  |             | 100  | STK-100LBS/6G                      |
|                                     |             |               | -200  |             | 200  | STK-200LBS/6G                      |
|                                     |             |               | -300  |             | 300  | STK-300LBS/6G                      |
|                                     |             |               | -400  |             | 400  | STK-400LBS/6G                      |
|                                     |             |               | -500  |             | 500  | STK-500LBS/6G                      |
|                                     |             |               | -600  |             | 600  | STK-600LBS/6G                      |
|                                     |             |               | -700  |             | 700  | STK-700LBS/6G                      |
|                                     |             |               | -800  |             | 800  | STK-800LBS/6G                      |
|                                     |             |               | -900  |             | 900  | STK-900LBS/6G                      |
|                                     |             |               | -1000 |             | 1000 | STK-1000LBS/6G                     |
| Supply voltage                      | $V_{cc}$    | V             |       | $5 \pm 5\%$ |      |                                    |
| Current consumption                 | $I_{cc}$    | mA            |       | 10          |      |                                    |
| Quiescent voltage                   | $V_{off}$   | V             | 2.45  | 2.5         | 2.55 | $V_{out} @ 0\text{A}$              |
| Rated output voltage                | $V_{FS}$    | V             |       | $\pm 2$     |      | $(V_{out} @ \pm I_{PM}) - V_{off}$ |
| Internal output resistance          | $R_{out}$   | $\Omega$      |       | 2           |      | $V_{out}$                          |
| Theoretical gain<br>(refer remarks) | $G_{th}$    | mV/A          |       | 20          |      | STK-100LBS/6G                      |
|                                     |             |               |       | 10          |      | STK-200LBS/6G                      |
|                                     |             |               |       | 6.66        |      | STK-300LBS/6G                      |
|                                     |             |               |       | 5           |      | STK-400LBS/6G                      |
|                                     |             |               |       | 4           |      | STK-500LBS/6G                      |
|                                     |             |               |       | 3.33        |      | STK-600LBS/6G                      |
|                                     |             |               |       | 2.85        |      | STK-700LBS/6G                      |
|                                     |             |               |       | 2.5         |      | STK-800LBS/6G                      |
|                                     |             |               |       | 2.22        |      | STK-900LBS/6G                      |
|                                     |             |               |       | 2           |      | STK-1000LBS/6G                     |
| Rated linearity error               | Non-L       | % $I_{PM}$    | -1    |             | 1    | $\pm I_{PM}$                       |
| Step response time                  | $t_{res}$   | $\mu\text{s}$ |       | 3           |      | @90% of $I_{PM}$                   |
| Delay time                          | $t_{delay}$ | $\mu\text{s}$ |       | 1.5         |      | 250 kHz sine wave                  |
| Frequency bandwidth<br>(-3dB)       | BW          | kHz           |       | 250         |      | No RC circuit                      |
| Output voltage noise                | $V_{noise}$ | mVpp          |       | 20          |      |                                    |
|                                     |             |               |       | 30          |      |                                    |
| Accuracy @ $T_A = 25^\circ\text{C}$ | X           | % of $I_{PM}$ |       | $\pm 1$     |      | @ $25^\circ\text{C}$               |

|                       |          |                      |      |  |     |               |
|-----------------------|----------|----------------------|------|--|-----|---------------|
| Accuracy over T range | X_TRange | % of I <sub>PM</sub> | -3.5 |  | 3.5 | -40°C ~ 105°C |
|-----------------------|----------|----------------------|------|--|-----|---------------|

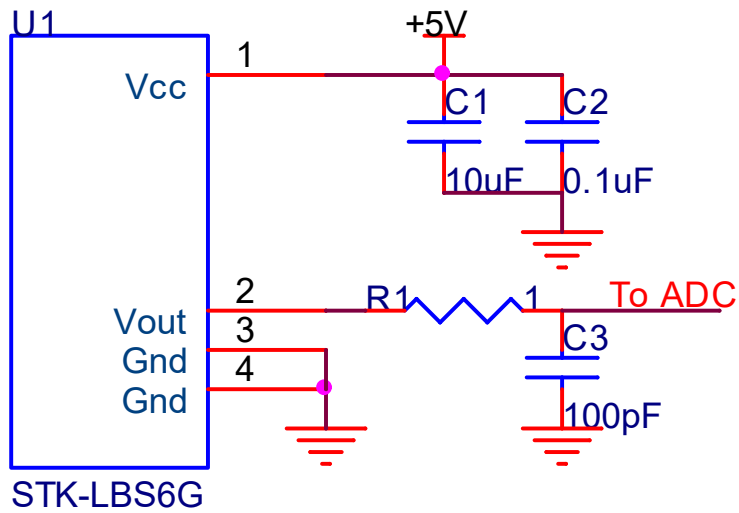
**Remarks:**

- ✧ The theoretical gain, G<sub>th</sub>, is the fitted gain when the sensor is installed with a conduct rod. The value can be obtained during the calibration process (the sensor is fixed surrounding a conduct rod).

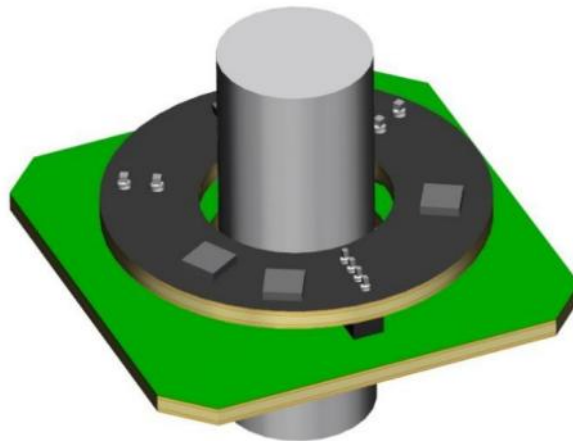
### 3. Dimension & Pin Definitions



## 4. Typical Application Circuit



## 5. Sensor Installation



- ✧ The sensor is fixed on the user's PCB surrounding the conduct rod.
- ✧ On the holding PCB, it is recommended to put a shielding ground on the top layer (facing to the sensor) under the sensor. This is helpful to protect the signal from the  $dV/dt$  radiation.