Current Sensor

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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CONTENT

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_A	℃	-40 ~ 105
Storage temperature	T_stg	℃	-40 ~ 125
Mass	m	g	10

Absolute maximum rating

Parameter	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 parameter

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	0.5	Dependent on installation

2. Electrical Data

Condition：T_A = 25℃，Vcc = 5 V

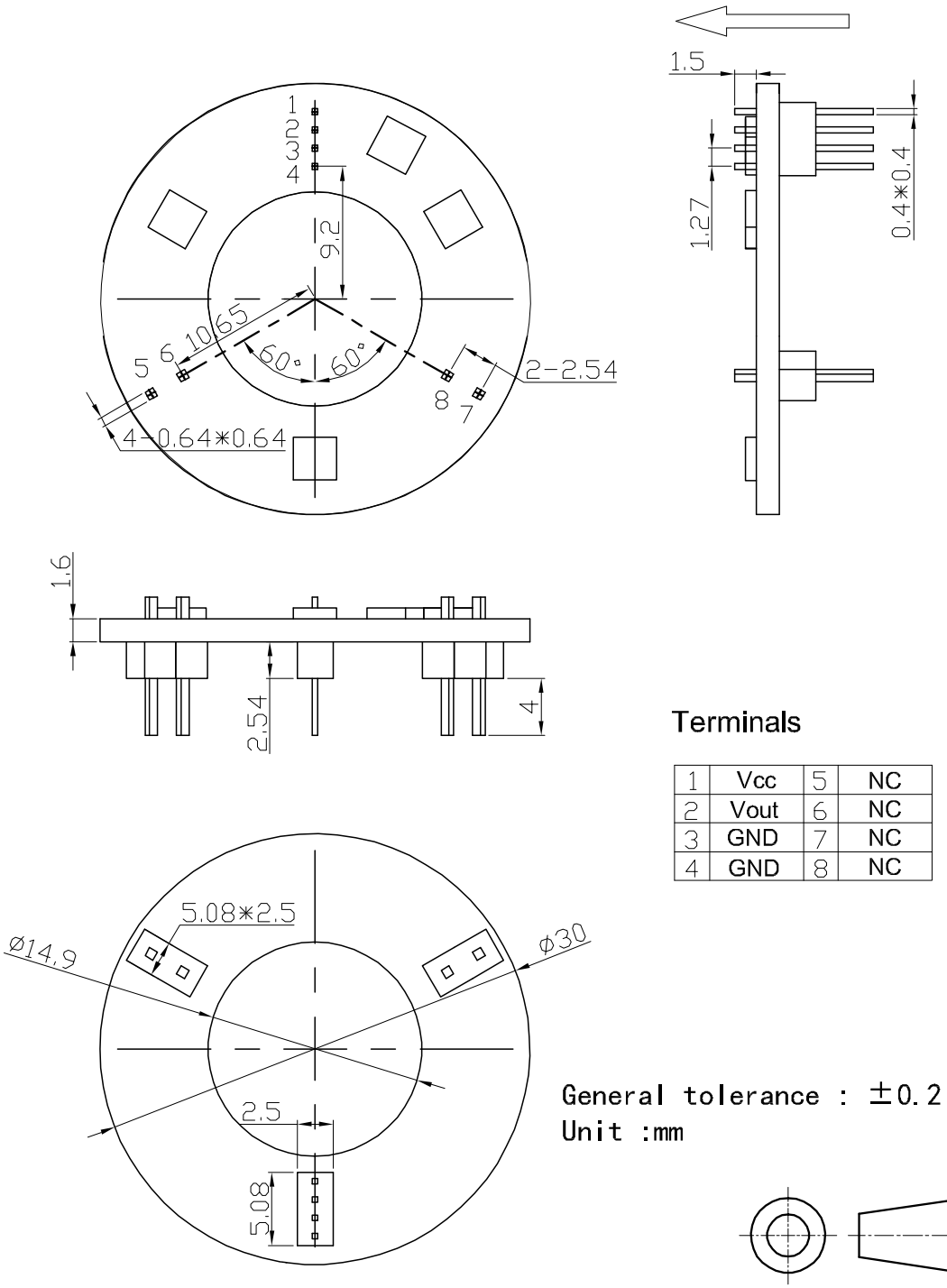
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary current range	I_{PM}	A	-100		100	STK-100LBS/6G
			-200		200	STK-200LBS/6G
			-300		300	STK-300LBS/6G
			-400		400	STK-400LBS/6G
			-500		500	STK-500LBS/6G
			-600		600	STK-600LBS/6G
			-700		700	STK-700LBS/6G
			-800		800	STK-800LBS/6G
			-900		900	STK-900LBS/6G
			-1000		1000	STK-1000LBS/6G
Supply voltage	Vcc	V		5 ± 5%		
Current consumption	Icc	mA		10		
Quiescent voltage	Voff	V	2.45	2.5	2.55	Vout @ 0 A
Rated output voltage	V_FS	V		± 2		(Vout @ ±I_{PM}) – Voff
Internal output resistance	R_out	Ω		2		Vout
Theoretical gain (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	± I_{PM}
Step response time	t_res	μs		3		@90% of I_{PM}
Delay time	t_delay	μs		1.5		250 kHz sine wave
Frequency bandwidth (-3dB)	BW	kHz		250		No RC circuit
Output voltage noise DC ~ 10 kHz DC ~ 100 kHz	Vnoise	mVpp		 20 30		
Accuracy @ TA = 25℃	X	% of I_{PM}		±1		@ 25℃

Accuracy over T range	X_TRange	% of I_{PM}	-3.5		3.5	-40℃ ~ 105℃

Remarks：

✧ The theoretical gain, G_th, 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

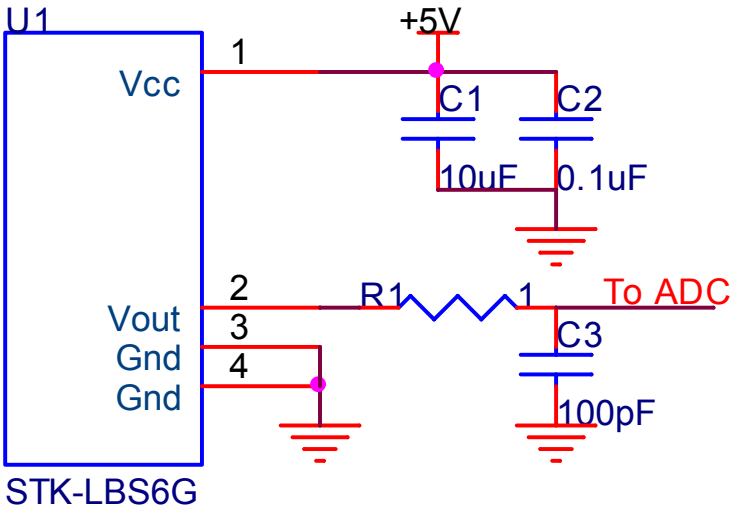


Terminals

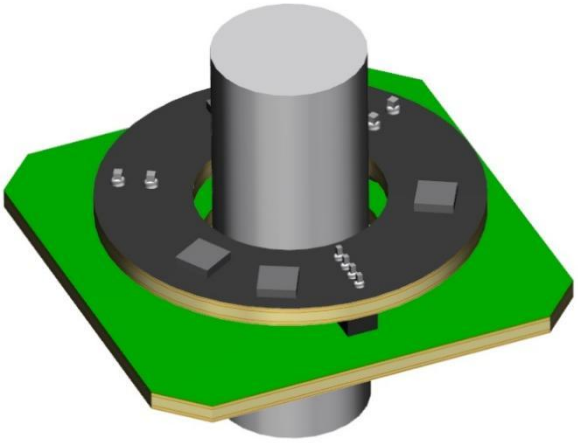
1	Vcc	5	NC
2	Vout	6	NC
3	GND	7	NC
4	GND	8	NC

General tolerance : ±0.2
Unit :mm

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 shieling ground on the top layer (facing to the sensor) under the sensor. This is helpful to protect the signal from the dV/dt radiation.