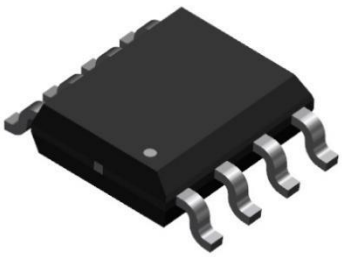
SINOMAGS
希 磁 科 技

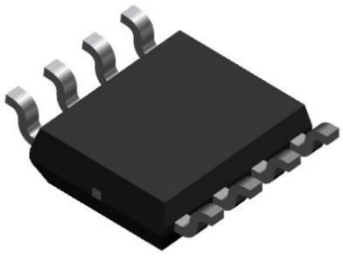
Current Sensor

Product Series： STK-616YML

Part number：
STK-616Y-20MLB5
STK-616Y-25MLB5
STK-616Y-30MLB5
STK-616Y-40MLB5
STK-616Y-50MLB5
STK-616Y-50MLB3

Version： Ver 2.5





Sinomags Technology Co., Ltd

Web site: www.sinomags.com

CONTENT

1. Introduction

STK-616YM series current sensor is based on TMR (tunnel magneto resistance) 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.

Typical applications

- AC variable speed drives
- Switching power supply
- Motor control

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	℃	-40 ~ 125
Storage temperature	T_stg	℃	-40 ~ 125
Mass	m	g	0.1

Absolute maximum rating

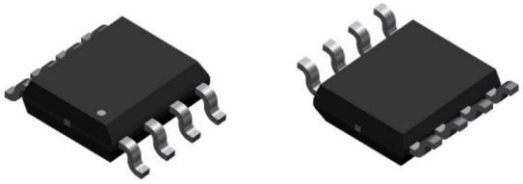
Parameter	Symbol	Unit	Value
Supply voltage	V_{CC}	V	6
ESD rating (HBM)	U_{ESD}	kV	4

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	2.1	STK-616Y-XXMLBX-C
			2.4	STK-616Y-XXMLBX-D
Clearance distance (Shortest distance through air)	dCl	mm	2.1	STK-616Y-XXMLBX-C
			4.2	STK-616Y-XXMLBX-D
Creepage distance (Shortest path along device body)	dCp	mm	2.1	STK-616Y-XXMLBX-C
			4.2	STK-616Y-XXMLBX-D

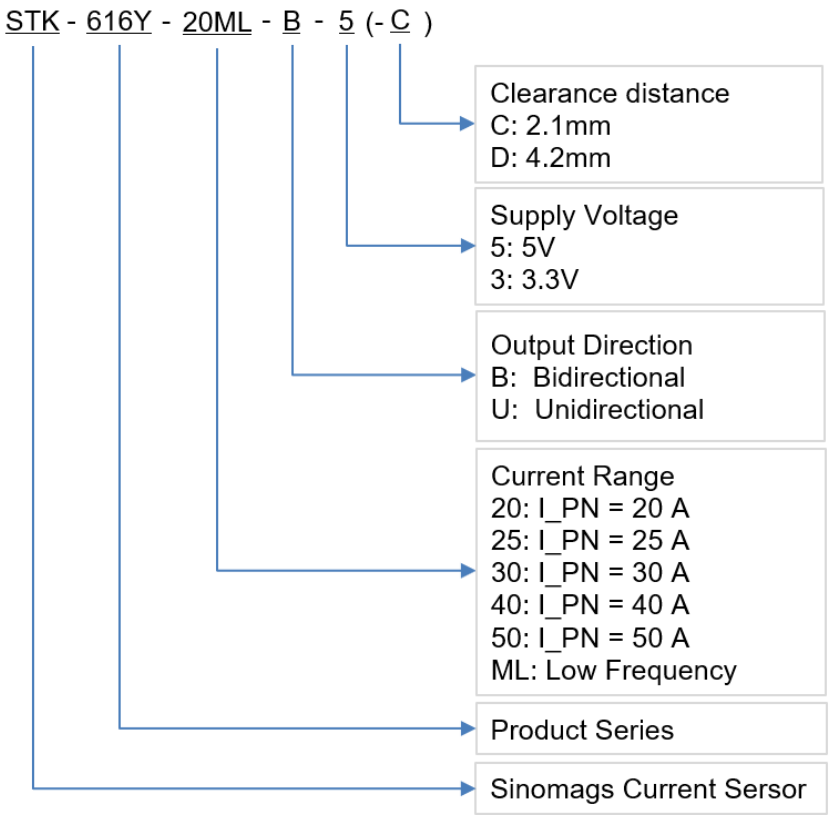
2. Package: SOIC8 compatible



3. Selection Guide

Part Number	Vcc(V)	Current Range (A)	Sensitivity (mV/A)	Offset (V)	Current Directionality	Top(℃)
STK-616Y-20MLB5	5	±20	100	2.5	Bidirectional	-40~125
STK-616Y-25MLB5	5	±25	80	2.5	Bidirectional	-40~125
STK-616Y-30MLB5	5	±30	66.7	2.5	Bidirectional	-40~125
STK-616Y-40MLB5	5	±40	50	2.5	Bidirectional	-40~125
STK-616Y-50MLB5	5	±50	40	2.5	Bidirectional	-40~125
STK-616Y-50MLB3	3.3	±50	26.4	1.65	Bidirectional	-40~125

4. Production Information



5. Electrical data STK-616Y-XXMLB5

Condition：T_A = 25℃, Vcc = 5 V

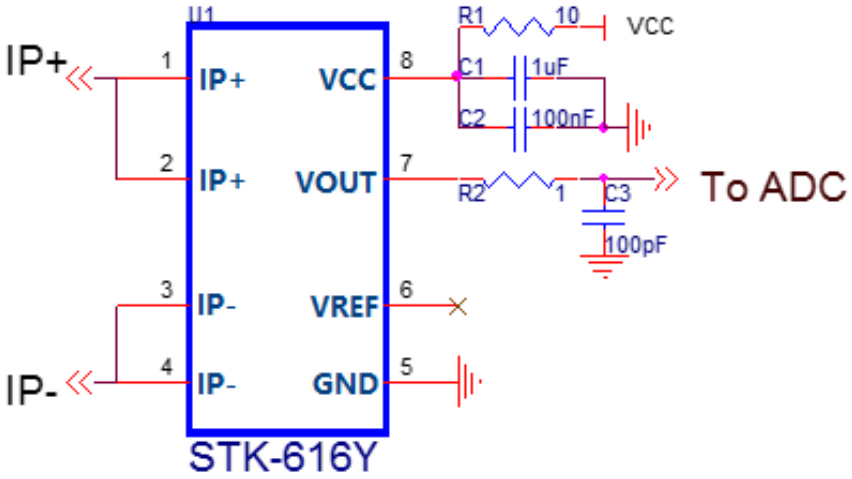
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Supply voltage	Vcc	V		5±5%		STK-616Y-XXMLB5
Current consumption	Icc	mA		6		STK-616Y-XXMLB5
Primary conductor resistance	R_pr	mΩ		0.9		STK-616Y-XXMLB5
Quiescent voltage Vout @ 0 A	$V_{IOUT(Q)}$	V		2.5±0.05		STK-616Y-XXMLB5
Zero Current Reference Voltage	V_{REF}	V		2.5±0.05		STK-616Y-XXMLB5
Peak output voltage (Vout @ ±I_pm) –$V_{IOUT(Q)}$	V_FS	V		±2		STK-616Y-XXMLB5
Internal output resistance	R_out	Ω		2		STK-616Y-XXMLB5
Rated linearity error	E_{LIN}	% I_{PN}		±1		±I_{PN}
Step response time	t_res	μs		1		@90% of I_pn STK-616Y-XXMLB5
Frequency bandwidth (-3dB)	BW	kHz		400		@-3dB STK-616Y-XXMLB5
Output voltage noise	Vnoise	mVpp		10		@1.4MHz
Accuracy @ 25℃	E_{TOT}	% of I_{PN}		±1.5		All
Accuracy @ -40℃ ~ 105℃	E_{TOT}	% of I_{PN}		±3.5		All

6. Electrical data STK-616Y-XXMLB3

Condition：T_A = 25℃, Vcc = 3.3 V

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Supply voltage	Vcc	V		3.3±5%		STK-616Y-XXMLB3
Current consumption	Icc	mA		6		STK-616Y-XXMLB3
Primary conductor resistance	R_pr	mΩ		0.9		STK-616Y-XXMLB3
Quiescent voltage Vout @ 0 A	$V_{IOUT(Q)}$	V		1.65±0.05		STK-616Y-XXMLB3
Zero Current Reference Voltage	V_{REF}	V		1.65±0.05		STK-616Y-XXMLB3
Peak output voltage (Vout @ ±I_pm) –$V_{IOUT(Q)}$	V_FS	V		±1.32		STK-616Y-XXMLB3
Internal output resistance	R_out	Ω		2		STK-616Y-XXMLB3
Rated linearity error	E_{LIN}	% I_{PN}		±1		±I_{PN}
Step response time	t_res	μs		1		@90% of I_pn STK-616Y-XXMLB3
Frequency bandwidth (-3dB)	BW	kHz		400		@-3dB STK-616Y-XXMLB3
Output voltage noise	Vnoise	mVpp		10		@1.4MHz
Accuracy @ 25℃	E_{TOT}	% of I_{PN}		±1.5		All
Accuracy @ -40℃ ~ 105℃	E_{TOT}	% of I_{PN}		±3.5		All

7. Typical Application Circuit



8. Characteristic Definitions

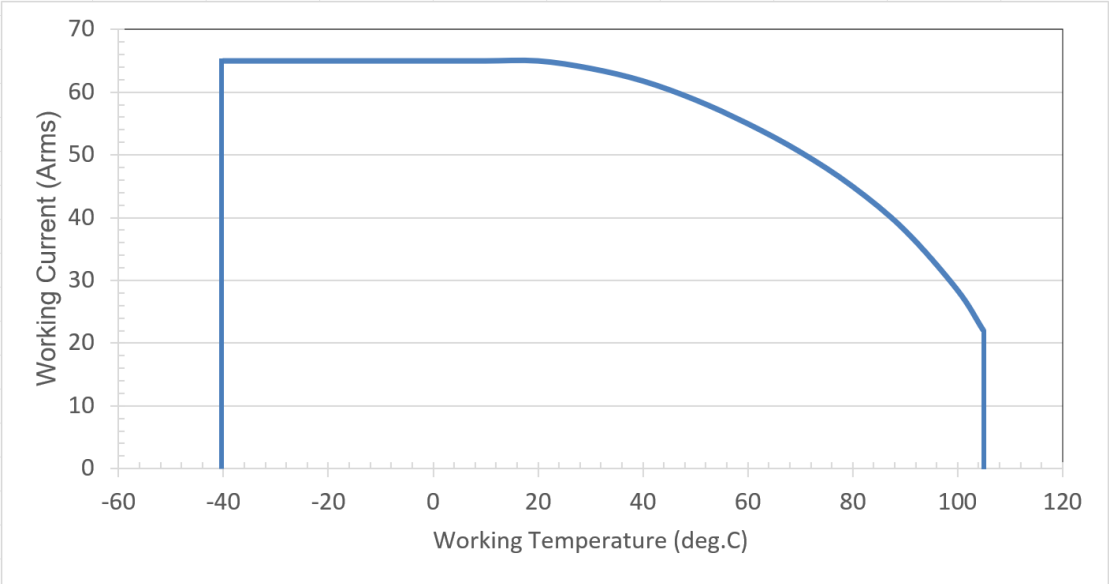
SENSITIVITY (Sens)

The change in sensor output in response to a 1 A change through the primary conductor. The sensitivity is the sensor gain (mv/A) for the full-scale current of the device. The sensitivity is fixed and does not change with the supply voltage.

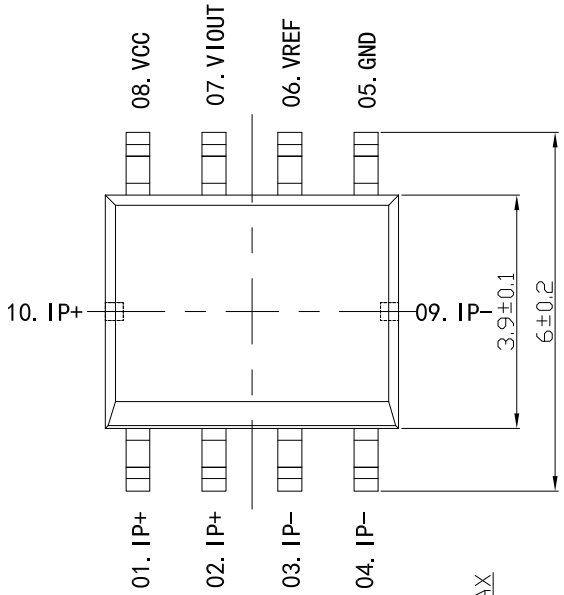
ZERO CURRENT OUTPUT VOLTAGE (VIOUT(Q))

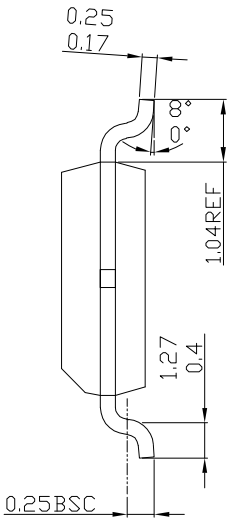
The output of the sensor when the primary current is zero. When the power supply is 5 V, it nominally remains at 2.5 V for a bidirectional device. When the power supply is 3.3 V, it nominally remains at 1.65 V for a bidirectional device.

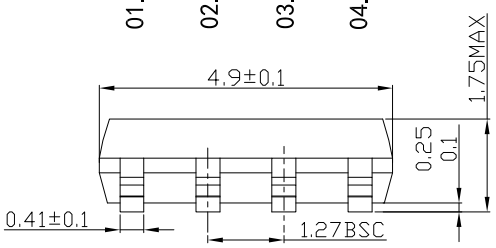
9. Continues current vs working temperature

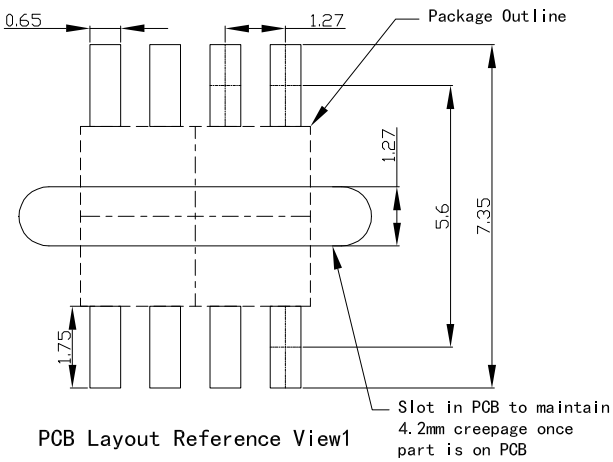


10. Dimension & Pin Definitions

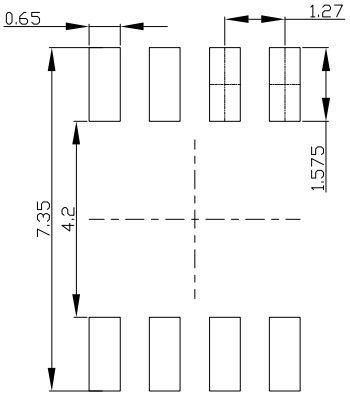








PCB Layout Reference View1



PCB Layout Reference View2

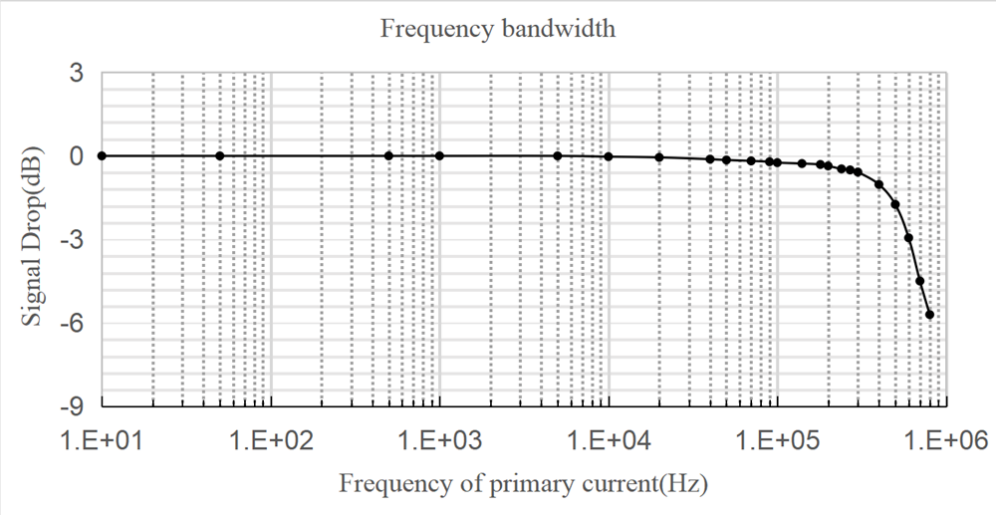
For PCB assemblies that cannot support a slotted design, the above stretched footprint may be used

11. Pin definitions

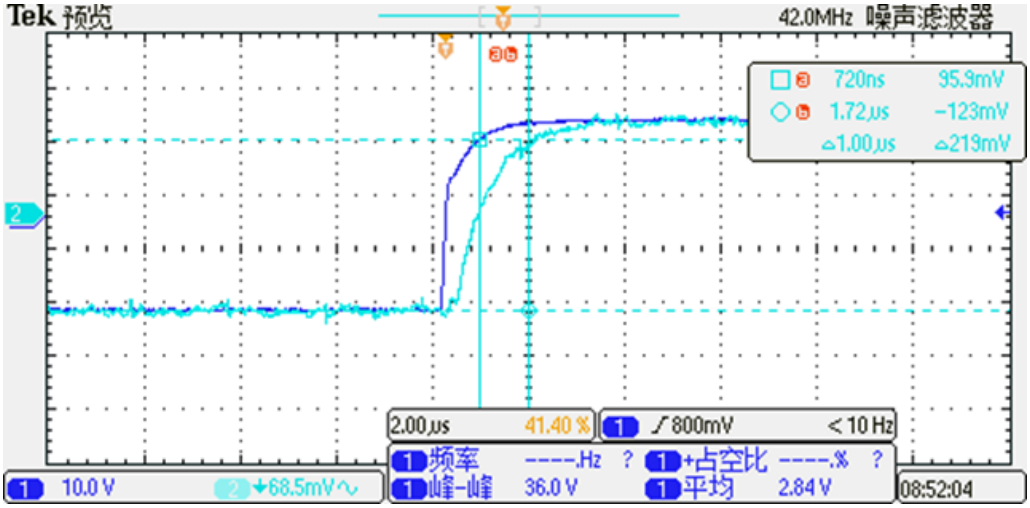
Pin definition for product with OCD function

PIN	Symbol	Description
1,2	IP+	Primary conductor pin (+)
3,4	IP-	Primary conductor pin (-)
5	GND	Ground pin (GND)
6	VREF	Zero current voltage reference
7	VIOUT	Sensor output pin
8	VCC	Power supply pin

12. Frequency Bandwidth of STK-616Y-XXMLBX



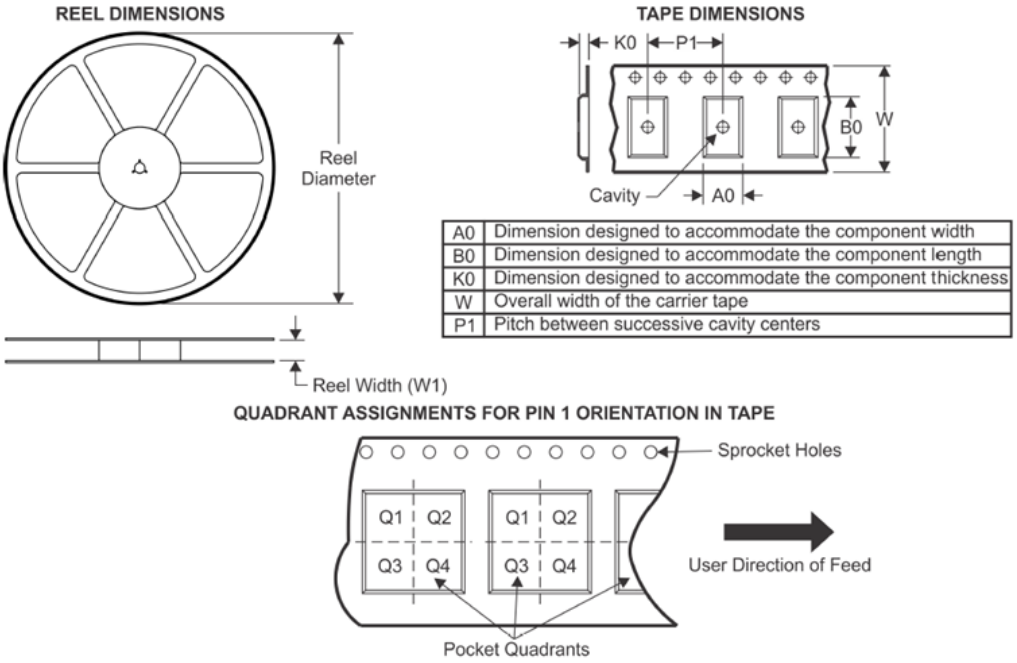
13. Step response time of STK-616Y-XXMLBX



The typical low frequency response of STK-616YML current sensor. The response time from 90% of the primary current to 90% of the secondary output is 1µs.

14. Dimension & Pin Definitions

TAPE AND REEL INFORMATION



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers