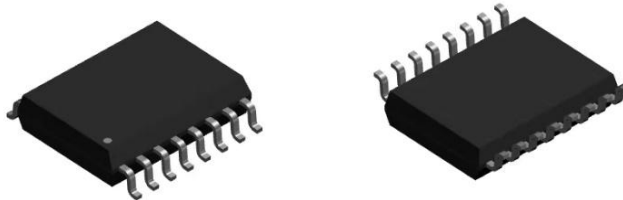


Current Sensor

Product Series: STK-616EML

Part number: STK-616E-20MLB5
STK-616E-30MLB3
STK-616E-30MLB5
STK-616E-50MLB5
STK-616E-65MLB5

Version: Ver 2.2



Sinomags Technology Co., Ltd

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1. Description

The STK-616EM series current sensor is based on TMR (tunnel magneto resistance) technology and 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
- Electric welder power supply
- Solar energy
- Switched model power supplies (SMPS)

General parameter

Parameter	Symbol	Unit	Value
Working temperature	T_A	°C	-40 ~ 125
Storage temperature	T_stg	°C	-40 ~ 125
Mass	m	g	0.5

Absolute maximum rating

Parameter	Symbol	Unit	Value
Supply voltage	Vcc	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.

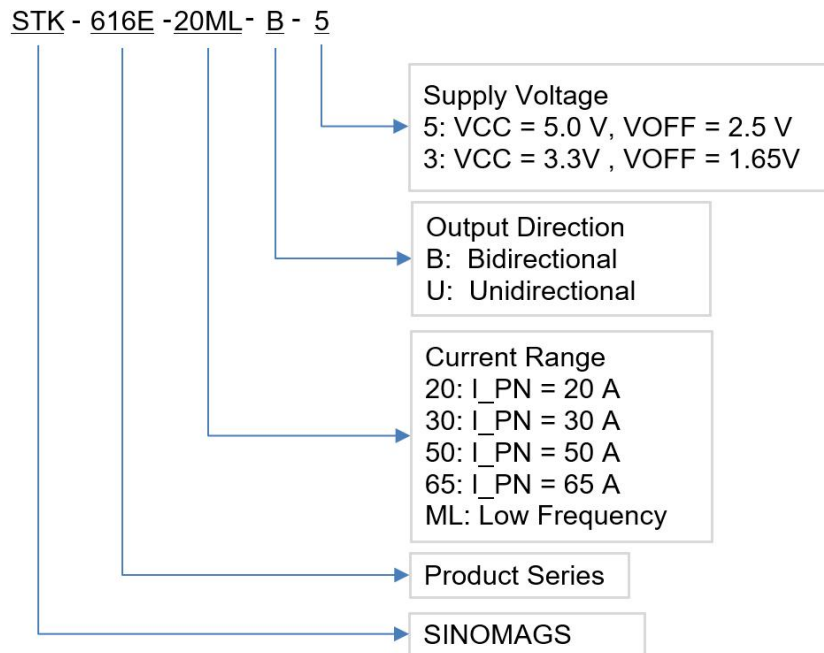
Isolation parameter

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC test 50Hz/1 min	Ud	kV	3.6	
Impulse withstand voltage 1.2/50μs	Ūw	kV	6	
Clearance distance (pri. -sec)	dCl	mm	8	Determined by customer's layout
Creepage distance (pri. -sec)	dCp	mm	8	

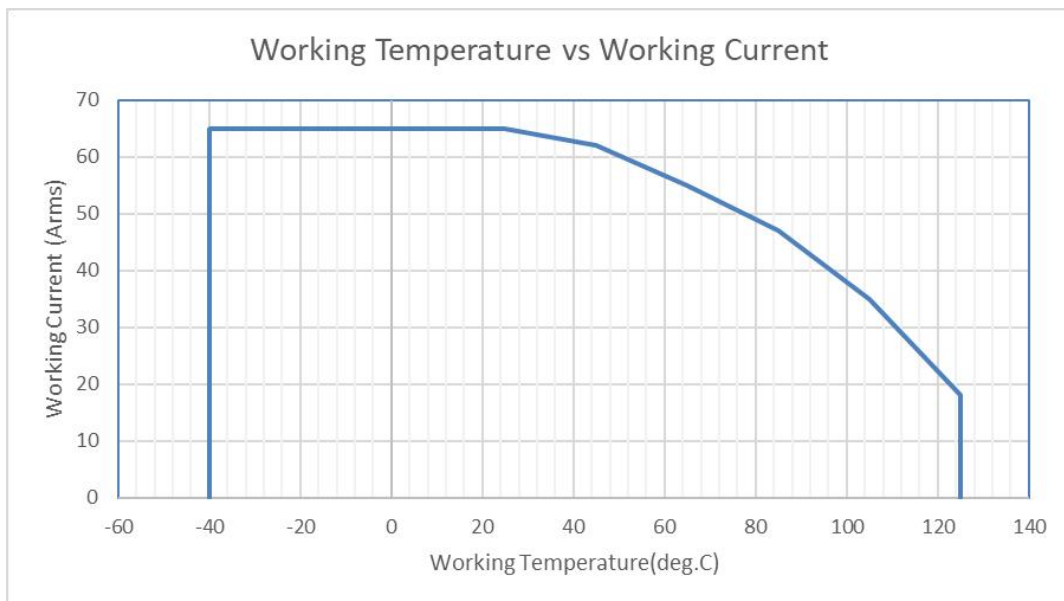
Measuring current table

Product	Optimized Range	Sensitivity, (mV/A)	T(°C)
STK-616E-20MLB5	±20 A	100	-40 ~ 125
STK-616E-30MLB3	±30 A	44	-40 ~ 125
STK-616E-30MLB5	±30 A	66.7	-40 ~ 125
STK-616E-50MLB5	±50 A	40	-40 ~ 125
STK-616E-65MLB5	±65 A	30.75	-40 ~ 125

2. Part number definition



3. Temperature vs Current



4. Electrical data STK-616EM-XXMLB5

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

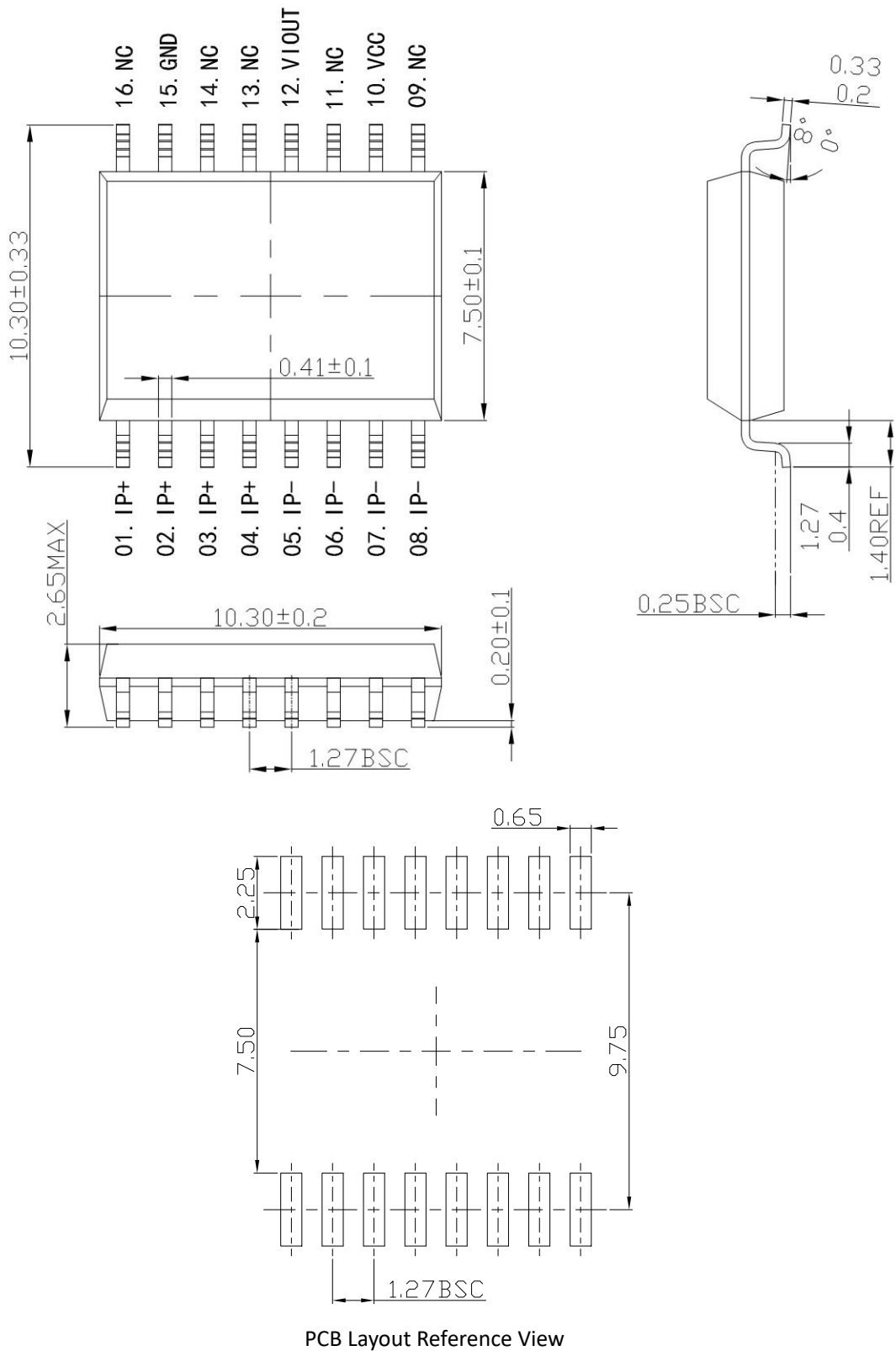
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{pn}	A	-20		20	STK-616E-20MLB5
			-30		30	STK-616E-30MLB5
			-50		50	STK-616E-50MLB5
			-65		65	STK-616E-65MLB5
Supply voltage	V_{CC}	V	4.75	5	5.25	STK-616E-20MLB5
						STK-616E-30MLB5
						STK-616E-50MLB5
						STK-616E-65MLB5
Current consumption	I_{CC}	mA		5	10	
Primary Conductor Resistance	R_{IP}	$m\Omega$		0.85		
Quiescent voltage	V_{off}	V	2.48	2.5	2.52	$V_{out} @ I_P=0\text{A}$
Internal output resistance	R_{out}	Ω		1		V_{out}
Theoretical gain	G_{th}	mV/A		100		STK-616E-20MLB5
				66		STK-616E-30MLB5
				40		STK-616E-50MLB5
				30.75		STK-616E-65MLB5
Error of gain	Err_G	% G_{th}		± 1		Trimmed in the factory @ 25°C Note 2)
Rated linearity error	Non-L	% I_{pn}		± 1		$\pm I_{pn}$
Step response time	t_{res}	μs		0.9		@90% of I_{pn} STK-616E-XXMLB5
Frequency bandwidth (-3dB)	BW	kHz		600		@-3dB STK-616E-XXMLB5
Output voltage noise DC ~ 100 kHz @250 kHz Sampling Rate	V_{noise}	mVpp		10		@1.4MHz
Accuracy @ 25°C	X	% of I_{pn}		± 1		@ 25°C
Accuracy @ $-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$	X_{TRange}	% of I_{pn}		± 3.5		$-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$

5. Electrical data STK-616EM-XXMLB3

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

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{pn}	A	-30		30	STK-616E-30MLB3
Supply voltage	V_{CC}	V	3.15	3.3	3.45	STK-616E-30MLB3
Current consumption	I_{CC}	mA		5	10	
Primary Conductor Resistance	R_{IP}	m Ω		0.85		
Quiescent voltage	V_{off}	V	1.6	1.65	1.7	$V_{out} @ I_P=0\text{A}$
Internal output resistance	R_{out}	Ω		1		V_{out}
Theoretical gain	G_{th}	mV/A		44		STK-616E-30MLB3
Error of gain	Err_G	% G_{th}		± 1		Trimmed in the factory @ 25°C Note 2)
Rated linearity error	Non-L	% I_{pn}		± 1		$\pm I_{pn}$
Step response time	t_{res}	μs		0.9		@90% of I_{pn} STK-616E-XXMLB3
Frequency bandwidth (-3dB)	BW	kHz		600		@-3dB STK-616E-XXMLB3
Output voltage noise DC ~ 100 kHz @250 kHz Sampling Rate	V_{noise}	mVpp		10		@1.4MHz
Accuracy @ 25°C	X	% of I_{pn}		± 1		@ 25°C
Accuracy @ $-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$	X_{TRange}	% of I_{pn}		± 3.5		$-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$

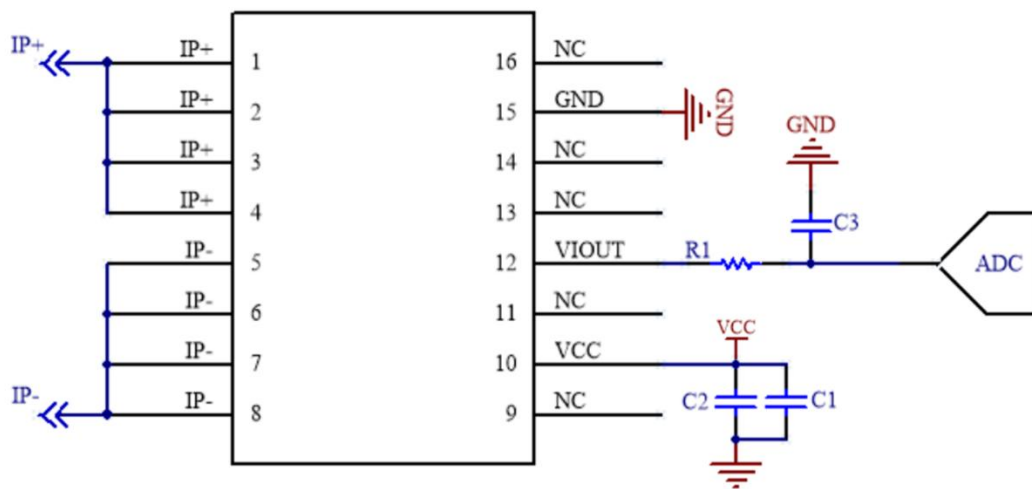
6. Dimension & Pin definitions



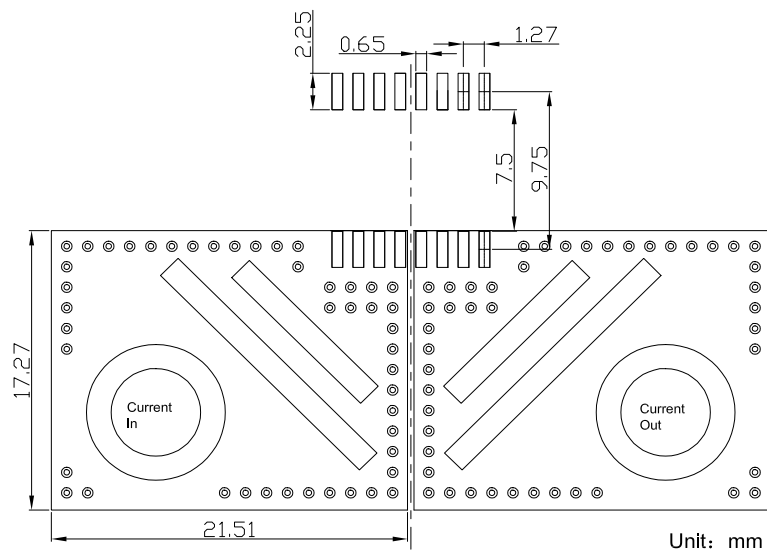
7. Pin definitions

PIN	Symbol	Description
1,2,3,4	IP+	Primary conductor pin (+)
5,6,7,8	IP-	Primary conductor pin (-)
15	GND	Ground pin (GND)
9,11,13,14,16	NC	No connection
12	VIOUT	Sensor output pin
10	VCC	Power supply pin

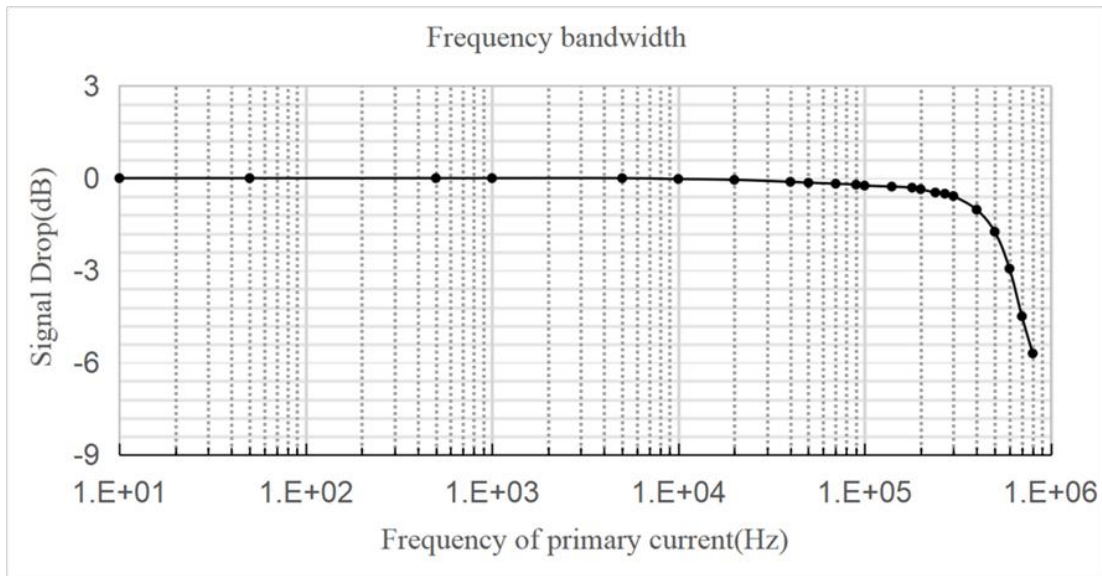
8. Typical Application of STK-616EML



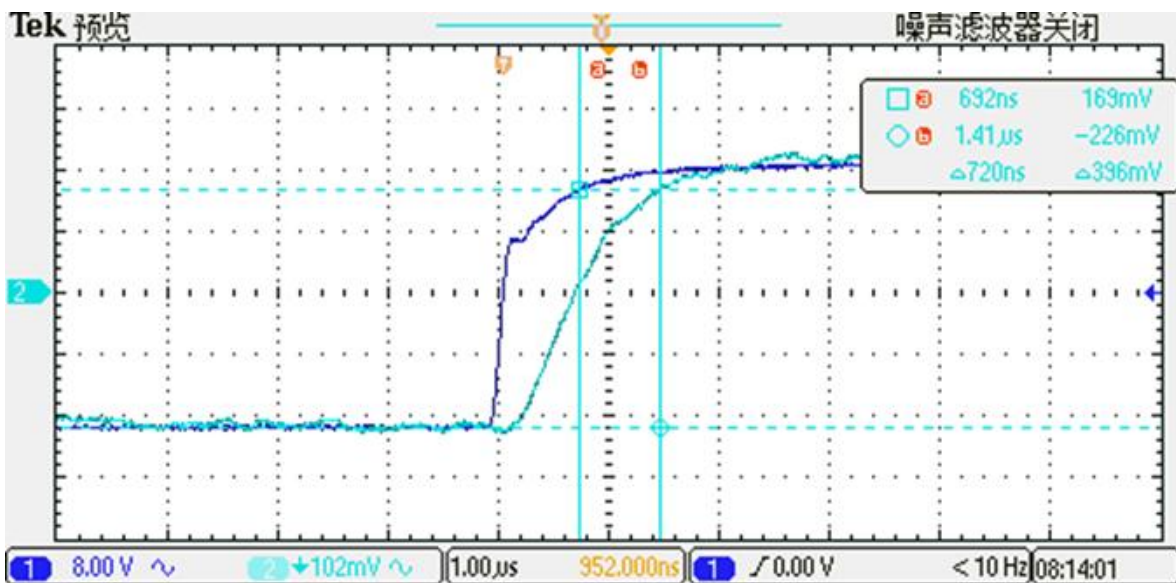
9. PCB layout recommendation



10. Frequency bandwidth of STK-616E-XXMLBX



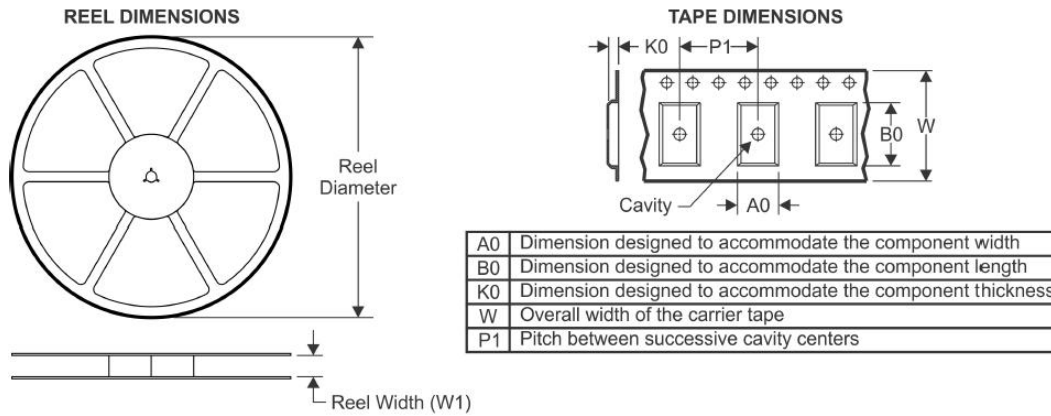
11. Step response time of STK-616E-XXMLBX



The typical frequency response of STK-616E-XXMLBX current sensor. The response time from 90% of the primary current to 90% of the secondary output is 0.9µs.

12. PACKAGE MATERIALS INFORMATION

TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

