CURRENT SENSOR

PRODUCT SERIES： STB-LA/D

PRODUCT PART NUMBER： STB-25LA/D, STB-50LA/D, STB-100LA/D

VERSION： Ver 1.6

Sinomags Technology Co., Ltd.

Web site: www.sinomags.com

CONTENT

1. Description

STB-LA/D series current sensors are based on close loop principle with TMR technology. The sensor can detect the current with DC, AC, pulse and irregular wave shape.

Typical application

- Solar inverter
- Uninterruptible Power Supplies (UPS)
- Variable frequency converter
- Direct-current dynamo
- Switched model power supplies (SMPS)

General parameters

Parameter	Symbol	Unit	Value
Working environment temperature	T_A	℃	-40 ~ 105
Sensor operating limit temperature	T_L	℃	-40 ~ 105
Storage temperature	T_stg	℃	-40 ~ 105
Mass	m	g	20

Absolute parameters

Parameters	Symbol	Unit	Value
Supply voltage	Vcc_max	V	±18
Maximum primary current	I_p_max	A	10*I_pn
ESD rating (HBM)	U_ESD_HBM	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 parameters

Parameter	Symbol	Unit	Value	Remark
RMS voltage for AC test 50Hz/1 min	Ud	kV	4	
Impulse withstand voltage 1.2/50μs	Ûw	kV	8	
Clearance distance (pri. -sec)	dCl	mm	10.2	Shortest distance through air
Creepage distance (pri. -sec)	dCp	mm	10.2	Shortest path along device body
Case material			V0	According to UL 94

2. Electrical parameters (STB-25LA/D)

Condition: Vcc = ±15V, T A = 25℃, unless specified.

Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary nominal rms current	I_pn	A		25		
Primary current measuring range	I_pm	A		55		@ VC = ±12V, RM = 10Ω @ VC = ±15V, RM = 22Ω
Supply voltage	Vcc	V	±12		±15	
Turns ratio	N_s	NT		1000		
Secondary coil resistance	R_S	Ω		80		@ T_A=85°C
Measuring resistance	R_m	Ω	10		400	
Secondary nominal r.m.s. current	I_sn	mA		25		
Current consumption	Icc	mA		10 + I_s		I_s =ABS(I_p / N_s)
Accuracy T_A= 25°C	X	%			±0.3	within I_pn
Linearity error within I_pn	ξ_L	% of I_pn			±0.20	
offset	I_OE	mA			±0.15	@ I_p = 0 A
Offset current temperature drift	I_OT	mA		±0.15	±0.30	-40℃ ~ 85℃
Reaction time @ 10 % of I_p	t_ra	μs		0.5		@10% of I_pn
Step response time @ 90 % of I_p	t_res	μs		0.5		@90% of I_pn
-3 dB band width	BW	kHz		150		
Accuracy T_A=105℃	X_TRange	% of I_pn	-1.5		1.5	T_A= -40℃ ~ 105℃

3. Electrical parameters (STB-50LA/D)

Condition: Vcc = ±15V, T A = 25℃, unless specified.

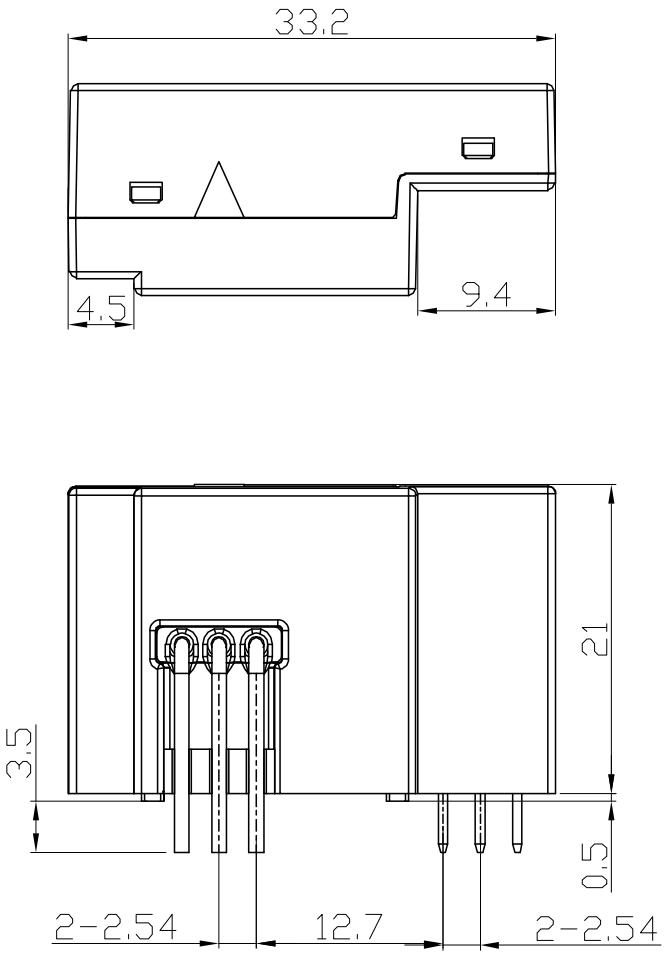
Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary nominal rms current	I_pn	A		50		
Primary current measuring range	I_pm	A	128			@ VC = ±12V, RM = 10Ω @ VC = ±15V, RM = 22Ω
Supply voltage	Vcc	V	±12		±15	
Turns ratio	N_s	NT		2000		
Secondary coil resistance	R_S	Ω		90		@ T_A=85°C
Measuring resistance	R_m	Ω	10		400	
Secondary nominal r.m.s. current	I_sn	mA		25		
Current consumption	Icc	mA		10 + I_s		I_s =ABS(I_p / N_s)
Accuracy T_A= 25°C	X	%			±0.5	within I_pn
Linearity error within I_pn	ξ_L	% of I_pn			±0.10	
offset	I_OE	mA			±0.10	@ I_p = 0 A
Offset current temperature drift	I_OT	mA		±0.15	±0.30	-40℃ ~ 85℃
Reaction time @ 10 % of I_p	t_ra	μs		0.5		@10% of I_pn
Step response time @ 90 % of I_p	t_res	μs		0.5		@90% of I_pn
-3 dB band width	BW	kHz		150		
Accuracy T_A=105℃	X_TRange	% of I_pn	-1.5		1.5	T_A= -40℃ ~ 105℃

4. Electrical parameters (STB-100LA/D)

Condition: Vcc = ±15V, , T A = 25℃, unless specified.

Parameters	Symbol	Unit	Min.	Typ.	Max.	Remark
Primary nominal rms current	I_pn	A		100		
Primary current measuring range	I_pm	A		175		@ VC = ±12V, RM = 10Ω @ VC = ±15V, RM = 20Ω
Supply voltage	Vcc	V	±12		±15	
Turns ratio	N_s	NT		2000		
Secondary coil resistance	R_S	Ω		90		@ T_A=85°C
Measuring resistance	R_m	Ω	10		100	
Secondary nominal r.m.s. current	I_sn	mA		50		
Current consumption	Icc	mA		10 + I_s		I_s =ABS(I_p / N_s)
Accuracy T_A= 25°C	X	%			±0.5	within I_pn
Linearity error within I_pn	ξ_L	% of I_pn			±0.10	
offset	I_OE	mA			±0.10	@ I_p = 0 A
Offset current temperature drift	I_OT	mA		±0.15	±0.30	-40℃ ~ 85℃
Reaction time @ 10 % of I_p	t_ra	μs		0.5		@10% of I_pn
Step response time @ 90 % of I_p	t_res	μs		0.5		@90% of I_pn
-3 dB band width	BW	kHz		150		
Accuracy T_A=105℃	X_TRange	% of I_pn	-1.5		1.5	T_A= -40℃ ~ 105℃

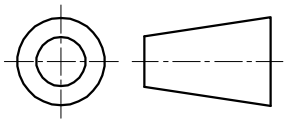
5. Dimensions: STB-25LA/D



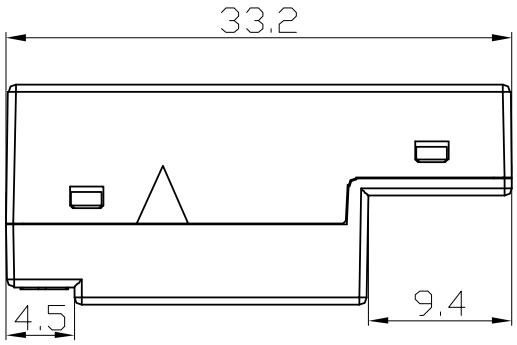
Terminals

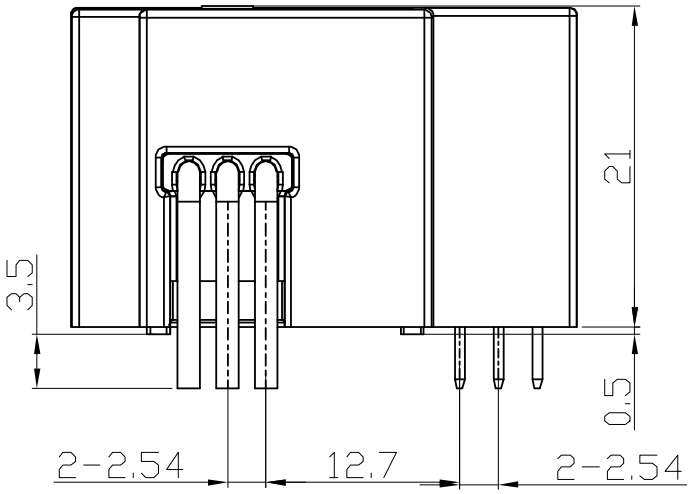
1	IP+	6	IP-
2	IP+	7	OUT
3	IP+	8	V+
4	IP-	9	V-
5	IP-		

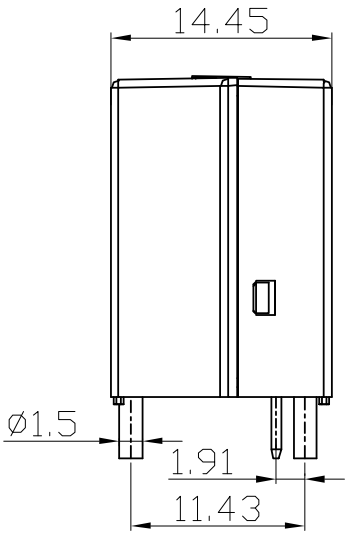
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm

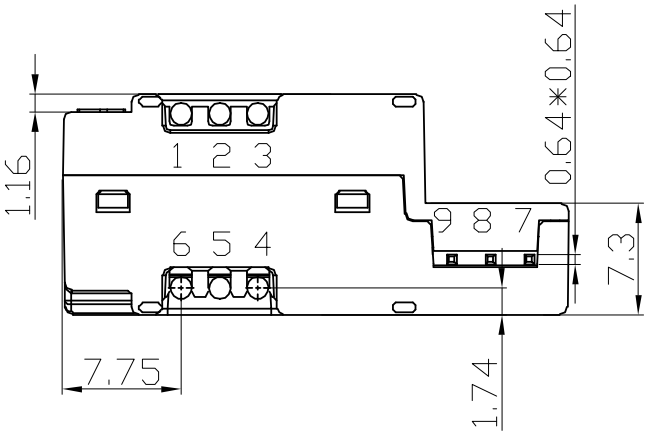


6. Dimensions: STB-50..100LA/D





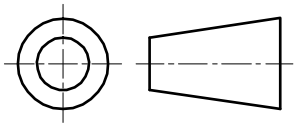




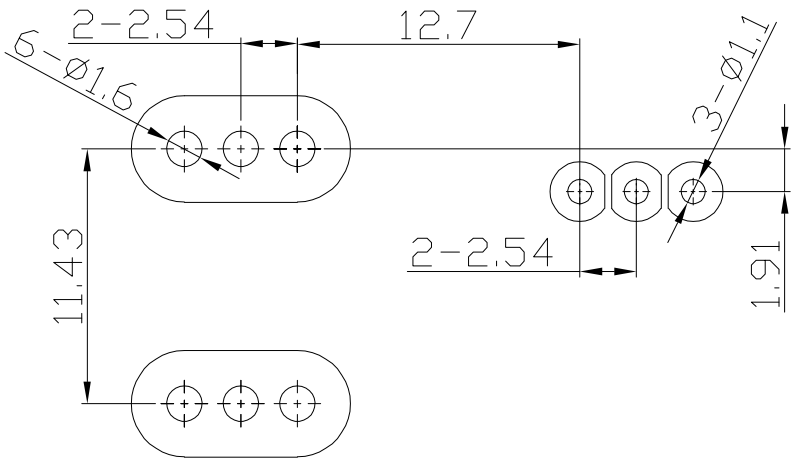
Terminals

1	IP+	6	IP-
2	IP+	7	OUT
3	IP+	8	V+
4	IP-	9	V-
5	IP-	10	

Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm



7. PCB footprint (STB-25LA/D)

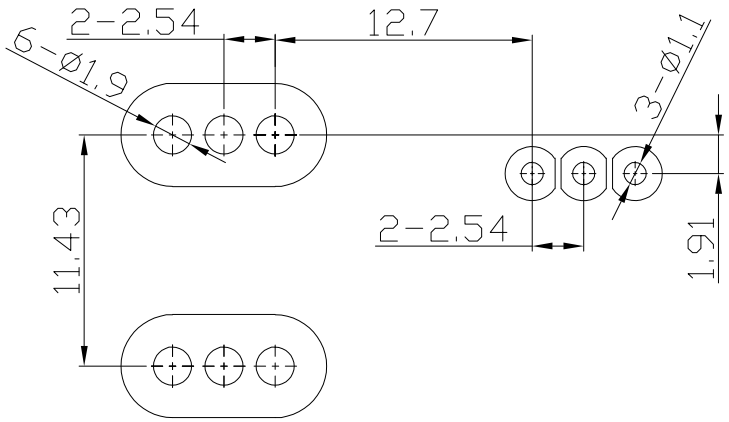


TOP side view

Assembly on PCB

- Recommended PCB hole diameter: 1 .1mm for secondary pins,
- Maximum PCB thickness: 2.4 mm (can be customized per request).
- Wave soldering profile: maximum 260℃ for 10 seconds.

8. PCB footprint (STB-50..100LA/D)



TOP side view

Assembly on PCB

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- Wave soldering profile: maximum 260℃ for 10 seconds.