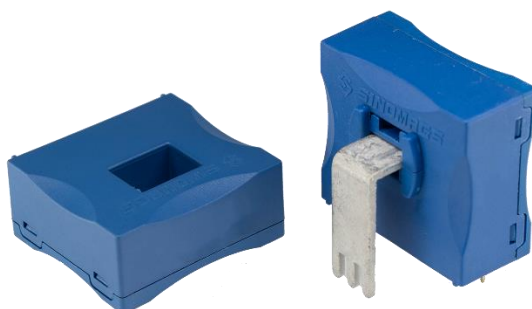


CURRENT SENSOR

PRODUCT SERIES: STB-LA
STB-50LA
PRODUCT PART NUMBER: STB-100LA , STB-150LA
STB-50LA/N
STB-100LA/N , STB-150LA/N
VERSION: Ver 3.7



Sinomags Technology Co., Ltd.

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1. Description

STB-LA 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
- BMS
- Direct-current dynamo
- Solar inverter
- Switched model power supplies (SMPS)

General parameters

| Parameter | Symbol | Unit | Value |
|------------------------------|--------|------|----------|
| Working temperature | T_A | °C | -40 ~ 85 |
| Storage temperature | T_stg | °C | -40 ~ 95 |
| Secondary Coil Res. @25°C | Rs | Ω | 65 ± 2 |
| Secondary Coil Res. @85°C | Rs | Ω | 85 ± 2 |
| Mass STB-xxxLA | m | g | 40 |
| Mass STB-xxxLA/N | m | g | 28 |

Maximum effective value

| Parameter | Symbol | Unit | Value |
|------------------------------------|------------------|------|-------|
| Supply voltage (non demolition) | V _C | V | ±16 |
| ESD Class (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 parameters

| Parameter | Symbol | Unit | Value | Remark |
|---------------------------------------|-----------------|------|--------------------------|------------------------------------|
| RMS voltage for AC test 50Hz/1 min | U _d | kV | 5 | |
| Impulse withstand voltage 1.2/50μs | Ū _w | kV | 10 | |
| Clearance distance (pri. -sec) | d _{Cl} | mm | 13 | Shortest distance through air |
| Creepage distance (pri. -sec) | d _{Cp} | mm | 13 | Shortest path along device body |
| Case material | | | V0 according to UL 94 | |

2. STB-50LA & STB-50LA/N Electrical parameters

Condition: $V_{cc} = \pm 15\text{ V}$, $R_L = 10\text{ k}\Omega$, $T_A = 25^\circ\text{C}$, unless specified.

| Parameters | Symbol | Unit | Min. | Typ. | Max. | Remark |
|-------------------------------------|-----------|---------------|----------|------------|------------|---|
| Primary nominal rms current | I_{pn} | A | | 50 | | |
| Primary current measuring range | I_{pm} | A | -200 | | 200 | Remark1 |
| Supply voltage | V_{cc} | V | ± 12 | | ± 15 | |
| Secondary Coil turns | N_s | N | | 2000 | | |
| Sampling resistance SPEC | R_m | Ω | | 33 | | |
| Secondary Coil Rated output current | I_{sn} | mA | | 25 | | |
| Consumption current | I_{cc} | mA | | $10 + I_s$ | | $I_s = \text{ABS}(I_p / N_s)$ |
| Sensitivity error | X | % | | | ± 0.5 | within I_{pn} |
| Linearity error within I_{pn} | ξ_L | % of I_{pn} | | | ± 0.10 | |
| offset | I_{OE} | mA | | | ± 0.10 | @ $I_p = 0\text{ A}$ |
| Magnetic bias current | I_{OM} | mA | | | ± 0.25 | $3 * I_{pn}$ remanence |
| Offset Temperature drift | I_{OT} | mA | | ± 0.15 | ± 0.30 | $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Reaction tim | t_{ra} | μs | | | 0.3 | @10% of I_{pn} |
| Step response tim (Remark2) | t_{res} | μs | | | 0.5 | @90% of I_{pn} |
| -1dB band width | BW | kHz | | 150 | | |

Remark:

- 1) The maximum test current is 200 A, DC or peak current, 85°C , $V_{cc} = \pm 12\text{ V}$ (tolerance $\pm 0.3\text{ V}$), sampling resistor $R_M \leq 33\ \Omega$. $X \leq 1\%$. If a larger maximum detection current is required, refer to the sampling resistance specification sheet.
- 2) $di/dt = 100\text{ A} / \mu\text{s}$.

3. STB-100LA & STB-100LA/N Electrical parameters

Condition: $V_{cc} = \pm 15\text{ V}$, $R_L = 10\text{ k}\Omega$, $T_A = 25^\circ\text{C}$, unless specified.

| Parameters | Symbol | Unit | Min. | Typ. | Max. | Remark |
|-------------------------------------|-----------|---------------|----------|------------|------------|---|
| Primary nominal rms current | I_{pn} | A | | 100 | | |
| Primary current measuring range | I_{pm} | A | -200 | | 200 | Remark1 |
| Supply voltage | V_{cc} | V | ± 12 | | ± 15 | |
| Secondary Coil turns | N_s | N | | 2000 | | |
| Sampling resistance SPEC | R_m | Ω | | 33 | | |
| Secondary Coil Rated output current | I_{sn} | mA | | 50 | | |
| Consumption current | I_{cc} | mA | | $10 + I_s$ | | $I_s = \text{ABS}(I_p / N_s)$ |
| Sensitivity error | X | % | | | ± 0.5 | within I_{pn} |
| Linearity error within I_{pn} | ξ_L | % of I_{pn} | | | ± 0.10 | |
| offset | I_{OE} | mA | | | ± 0.10 | @ $I_p = 0\text{ A}$ |
| Magnetic bias current | I_{OM} | mA | | | ± 0.25 | $3 * I_{pn}$ remanence |
| Offset Temperature drift | I_{OT} | mA | | ± 0.15 | ± 0.30 | $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Reaction tim | t_{ra} | μs | | | 0.3 | @10% of I_{pn} |
| Step response tim (Remark2) | t_{res} | μs | | | 0.5 | @90% of I_{pn} |
| -1dB band width | BW | kHz | | 150 | | |

Remark:

- 3) The maximum test current is 200 A, DC or peak current, 85°C , $V_{cc} = \pm 12\text{ V}$ (tolerance $\pm 0.3\text{ V}$), sampling resistor $R_M \leq 33\ \Omega$. $X \leq 1\%$. If a larger maximum detection current is required, refer to the sampling resistance specification sheet.
- 4) $di/dt = 100\text{ A} / \mu\text{s}$.

4. STB-150LA & STB-150LA/N Electrical parameters

Condition: $V_{cc} = \pm 15 \text{ V}$, $R_L = 10 \text{ k}\Omega$, $T_A = 25^\circ\text{C}$, unless specified.

| Parameters | Symbol | Unit | Min. | Typ. | Max. | Remark |
|-------------------------------------|-----------|---------------|----------|------------|------------|---|
| Primary nominal rms current | I_{pn} | A | | 150 | | |
| Primary current measuring range | I_{pm} | A | -240 | | 240 | (Remark3) |
| Supply voltage | V_{cc} | V | ± 12 | | ± 15 | |
| Secondary Coil turns | N_s | N | | 2000 | | |
| Sampling resistance SPEC | R_m | Ω | | 16.5 | | |
| Secondary Coil Rated output current | I_{sn} | mA | | 75 | | |
| Consumption current | I_{cc} | mA | | $10 + I_s$ | | $I_s = \text{ABS}(I_p / N_s)$ |
| Sensitivity error | X | % | | | ± 0.5 | within I_{pn} |
| Linearity error within I_{pn} | ξ_L | % of I_{pn} | | | ± 0.10 | within I_{pn} |
| offset | I_{OE} | mA | | | ± 0.10 | @ $I_p = 0 \text{ A}$ |
| Magnetic bias current | I_{OM} | mA | | | ± 0.25 | $3 * I_{pn}$ remanence |
| offset Temperature drift | I_{OT} | mA | | ± 0.15 | ± 0.30 | $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Reaction time | t_{ra} | μs | | | 0.3 | @10% of I_{pn} |
| Step response (Remark4) | t_{res} | μs | | | 0.5 | @90% of I_{pn} |
| -1dB band width | BW | kHz | | 150 | | |

Remark:

- 5) The maximum test current is 300 A, Short-circuit protection, Duration $\leq 400 \mu\text{s}$, @ $di/dt > 1\text{A}/\mu\text{s}$, 80°C , $V_{cc} = \pm 12 \text{ V}$ (tolerance $\pm 0.3 \text{ V}$), Sampling resistance $R_M \leq 16.4 \Omega$, $X \leq 5\%$.
- 6) $di/dt = 100 \text{ A} / \mu\text{s}$.

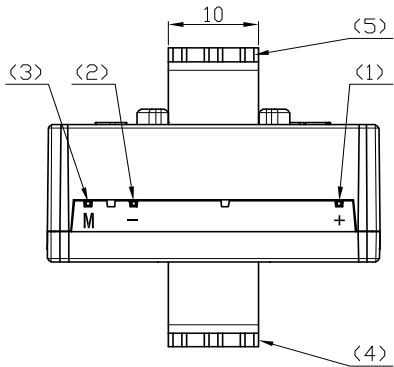
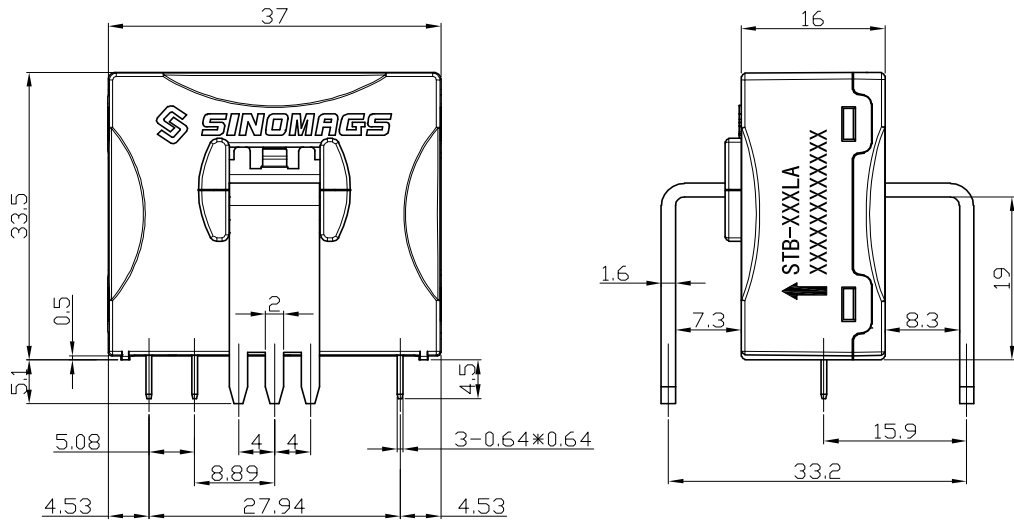
5. Sampling resistance Specification table

| Support Voltage | 12 V | 15 V | Recommend sampling resistance (Ω) |
|---------------------------------|---------------|---------------|-----------------------------------|
| Peak Current (A) | Max Value (Ω) | Max Value (Ω) | |
| 50 | 309.0 | 429.0 | 33 |
| 60 | 245.0 | 345.0 | |
| 70 | 199.3 | 285.0 | |
| 80 | 165.0 | 240.0 | |
| 90 | 138.3 | 205.0 | |
| 100 | 117.0 | 177.0 | |
| 110 | 99.5 | 154.1 | 16.4 |
| 120 | 85.0 | 135.0 | |
| 130 | 72.7 | 118.8 | |
| 140 | 62.1 | 105.0 | |
| 150 | 53.0 | 93.0 | |
| 160 | 45.0 | 82.5 | |
| 170 | 37.9 | 73.2 | |
| 180 | 31.7 | 65.0 | |
| 190 | 26.1 | 57.6 | |
| 200 | 21.0 | 51.0 | |
| 210 | 16.4 | 45.0 | 5 |
| 220 | 12.3 | 39.5 | |
| 230 | 8.5 | 34.6 | |
| 240 | 5.0 | 30.0 | |
| 250 | | 25.8 | |
| 260 | | 21.9 | |
| 270 | | 18.3 | |
| 280 | | 15.0 | |
| 290 | | 11.9 | |
| 300 | | 9.0 | |
| Temperature range: -40°C ~ 85°C | | | |

Remark:

- 1) Working on current exceeding 150 A of long time .It may cause the heat output of the sensor to exceed the designed normal working state;
- 2) When Primary current more than 240 A (peak current). It may lead to the decrease of sensor output accuracy;

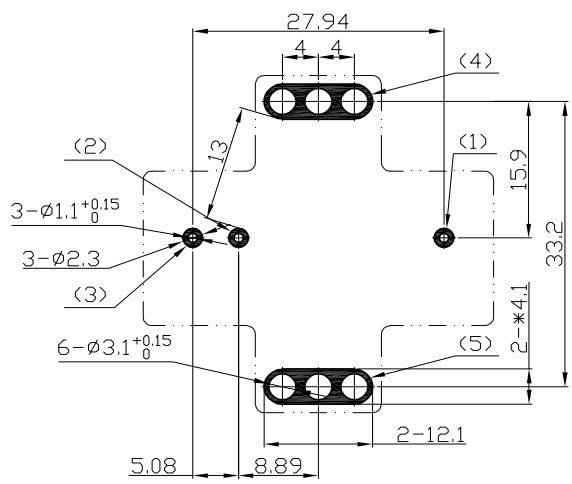
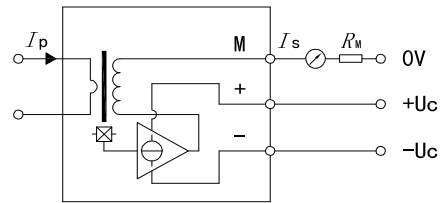
6. STB-50LA & STB-100LA & STB-150LA Dimensions & Pin define



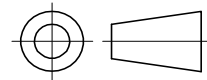
Terminals

| | |
|-----|-----|
| (1) | + |
| (2) | - |
| (3) | M |
| (4) | Ip+ |
| (5) | Ip- |

Connection



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

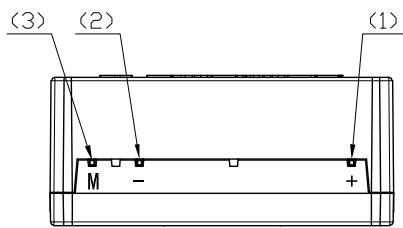
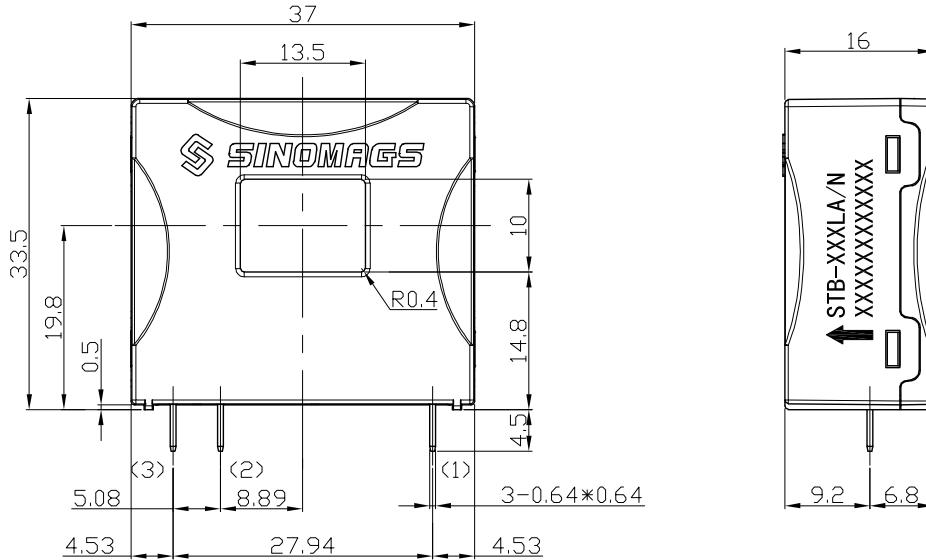


Mechanical properties

- General tolerances ± 0.5 mm;
- Fixed connection primary coil 6 PIN size is 2 * 1.6mm , The recommended diameter of PCB pad is 1.1 mm;
- Fixed connection second coil 3 PIN size is 0.6 * 0.6mm, he recommended diameter of PCB pad is 1.1 mm;

7. STB-50LA/N & STB-100LA/N & STB-150LA/N Dimensions & Pin

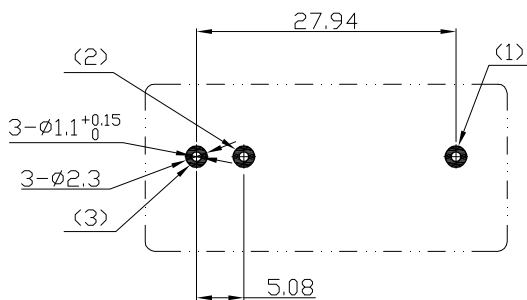
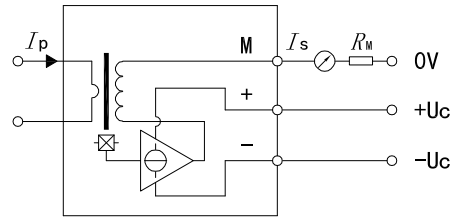
define



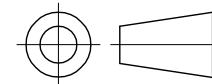
Terminals

| | |
|-----|---|
| (1) | + |
| (2) | - |
| (3) | M |

Connection



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



Mechanical properties

- General tolerances ± 0.5 mm;
- Fixed connection second coil 3 PIN size is 0.6 * 0.6mm . The recommended diameter of PCB pad is 1.1 mm;