SINOMAGS 希 磁 科 技

CURRENT SENSOR

PRODUCT SERIES：	STB-LF5
PRODUCT PART NUMBER：	STB-500LF5 STB-500LF5-A STB-500LF5-B STB-622LF5-S
VERSION：	Ver 1.8

Sinomags Technology Co., Ltd.

Web site: www.sinomags.com

CONTENT

1. Description

STB-LF5 series current sensors are based on close loop principle. The sensor can detect the current with DC, AC, pulse and irregular wave shape with current output.

Typical application

- Windmill inverters
- AC variable speed and servo motor drives
- Uninterruptible Power supplies (UPS)
- Power supplies for welding applications
- Test and measurement
- Battery supplied applications
- Switched Mode Power Supplies (SMPS)
- Static converts for DC motor drives

General parameters

Parameter	Symbol	Unit	Value
Sensor operating temperature	T_A	˚C	STB-500LF5 :-40 ~ 85 STB-500LF5-A: -40 ~ 85 STB-500LF5-B: -40 ~ 85 STB-622LF5-S: -40 ~ 85
Storage temperature	T_S	˚C	STB-500LF5 :-50 ~ 90 STB-500LF5-A: -50 ~ 90 STB-500LF5-B: -50 ~ 90 STB-622LF5-S: -50 ~ 90
Mass	m	g	STB-500LF5 : 240 STB-500LF5-A: 240 STB-500LF5-B: 240 STB-622LF5-S: 230

Absolute parameters

Parameters	Symbol	Unit	Value
Supply voltage (-40˚C…85˚C)	Vcc_{max}	V	±25.2
Maximum primary conductor temperature	$T_{B_{max}}$	˚C	100
Maximum steady state primary current (-40˚C…85˚C)	$I_{PN_{max}}$	A	STB-500LF5 : 500 STB-500LF5-A: 500 STB-500LF5-B: 500 STB-622LF5-S: 622

Ratings

Parameter	Unit	Value
Primary involved potential	V AC/DC	STB-500LF5 : 600 STB-500LF5-A: 600 STB-500LF5-B: 600 STB-622LF5-S: 1700
Maximum surrounding air temperature	˚C	85
Primary current	A	STB-500LF5 : 0…500 STB-500LF5-A: 0…500 STB-500LF5-B: 0…500

		STB-622LF5-S: 0…622

Isolation parameters

Parameter	Symbol	Unit	Value	Remark
RMS voltage for AC test 50Hz/1 min	U_d	kV	STB-500LF5 :3.8 STB-500LF5-A:3 STB-500LF5-B:3 STB-622LF5-S:3	
Impulse withstand voltage 1.2/50μs	U_W	kV	STB-500LF5 :12.5 STB-500LF5-A:10.6 STB-500LF5-B:10.6 STB-622LF5-S:10.8	
Clearance distance (pri. -sec)	d_{CI}	mm	STB-500LF5 :14.6 STB-500LF5-A:12.2 STB-500LF5-B:12.2 STB-622LF5-S:12.25	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	STB-500LF5 :15.6 STB-500LF5-A:18 STB-500LF5-B:18 STB-622LF5-S:13.3	Shortest path along device body
Case material	-	-	V0	According to UL 94
Comparative tracking index	CTI		STB-500LF5 : 600 STB-500LF5-A: 600 STB-500LF5-B: 600 STB-622LF5-S:175	

STB-622LF5-S Isolation parameters

According to EN 50178 and CEI 61010-1 standards and following conditions :

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
dCp, dCl, $\hat{V}_w$	Rated isolation voltage	Nominal voltage
Single isolation	1250 V	Cat III 1250 V rms
Reinforced isolation	630 V	Cat III 630 V rms

2. STB-500LF5 Electrical parameters

Condition: V_{CC} = ±14.25V~±25.2V, T_A= 25℃, unless specified.

Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω			70	@±500A with±14.25V
	R_M	Ω			18	@±800A with±14.25V
	R_M	Ω			95	@±500A with±17.1V
	R_M	Ω			35	@±800A with±17.1V
	R_M	Ω			155	@±500A with±22.8V
	R_M	Ω			70	@±800A with±22.8V
Secondary nominal RMS current	I_{SN}	A	-0.1		0.1	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	T_A=15℃
Supply voltage	V_{CC}	V	±14.25		±25.2	
Current consumption	I_{CC}	mA		26 + I_S 39 + I_S		V_{CC} =±15V V_{CC} =±25.2V
Nominal sensitivity	S_N	mA/A		0.2		
Offset current, referred to primary	I_O	A	-1		1	
Offset current temperature drift, referred to primary	I_{OT}	A	-0.6		0.6	
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.5		0.5	25…70…85℃
			-0.6		0.6	-40℃…85℃
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
RMS noise current referred to pri.	I_{no}	mA		90		1Hz to 20kHz
Reaction time @10% of I_{PN}	t_{ra}	μs			0.5	0 to 500A 200 A/us
Response time@90% of I_{PN}	t_r	μs			0.5	0 to 500A 200 A/us
Frequency bandwidth（-3dB）	BW	kHz		200		Small Signal bandwidth

3. STB-500LF5-A Electrical parameters

Condition: V_{CC}= ±14.25V~±25.2V, T_A= 25℃, unless specified.

Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω	0		60	@±500A with±15V
	R_M	Ω	0		11	@±800A with±15V
	R_M	Ω	0		92	@±500A with±18V
	R_M	Ω	0		30	@±800A with±18V
	R_M	Ω	5		149	@±500A with±24V
	R_M	Ω	5		65	@±800A with±24V
Secondary nominal RMS current	I_{SN}	A	-0.1		0.1	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	T_A=25℃
Supply voltage	V_{CC}	V	±15		±24	±5%
Current consumption	I_{CC}	mA		26 + I_S 39 + I_S		V_{CC} =±15V V_{CC} =±25.2V
Nominal sensitivity	S_N	mA/A		0.2		
Offset current	I_O	mA	-0.4		0.4	$I_P = 0$ T_A=25℃
Offset current temperature drift	I_{OT}	A	-0.5	±0.3	0.5	-40℃…85℃
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	T_A=25℃
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
Reaction time	t_{ra}	μs			1	10% of I_{PN}
Response time	t_r	μs			1	90% of I_{PN}
di/dt accurately followed	d_i/d_t	A/us	100			
Frequency bandwidth（-3dB）	BW	kHz		200		Small Signal bandwidth

4. STB-500LF5-B Electrical parameters

Condition: V_{CC}= ±14.25V~±25.2V, T_A= 25℃, unless specified.

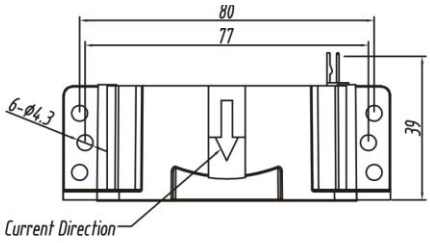
Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω	0		60	@±500A with±15V
	R_M	Ω	0		11	@±800A with±15V
	R_M	Ω	0		92	@±500A with±18V
	R_M	Ω	0		30	@±800A with±18V
	R_M	Ω	5		149	@±500A with±24V
	R_M	Ω	5		65	@±800A with±24V
Secondary nominal RMS current	I_{SN}	mA	-100		100	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	T_A=25℃
Supply voltage	V_{CC}	V	±15		±24	±5%
Current consumption	I_{CC}	mA		26 + I_S 39 + I_S		V_{CC} =±15V V_{CC} =±25.2V
Nominal sensitivity	S_N	mA/A		0.2		
Offset current	I_O	mA	-0.4		0.4	$I_P = 0$ T_A=25℃
Offset current temperature drift	I_{OT}	A	-0.5	±0.3	0.5	-40℃…85℃
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	T_A=25℃
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
Reaction time	t_{ra}	μs			1	10% of I_{PN}
Response time	t_r	μs			1	90% of I_{PN}
di/dt accurately followed	d_i/d_t	A/us	100			
Frequency bandwidth（-3dB）	BW	kHz		200		Small Signal bandwidth

5. STB-622LF5-S Electrical parameters

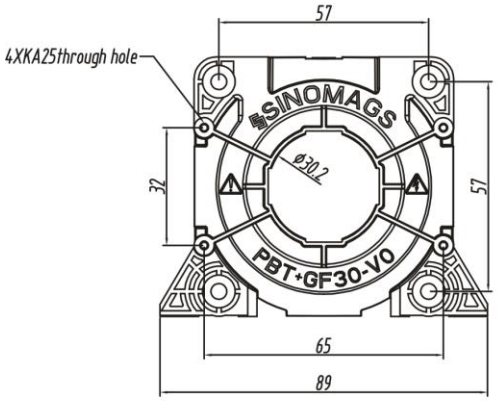
Condition: V_{CC} = ±24V , T A = 25℃, unless specified.

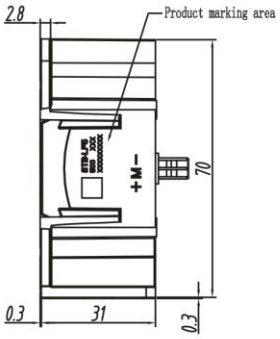
Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A		622		
Primary current measuring range	I_{PM}	A	-1700		1700	
Measuring resistance	R_M	Ω	2.5		115	@±622A with±24V
	R_M	Ω	2.5		60	@±825A with±24V
	R_M	Ω	2.5		5	@±1700A with±24V
Secondary nominal RMS current	I_{SN}	mA		155.5		
Turns ratio	N_S	NT		4000		
Resistance of secondary winding	R_S	Ω			43	@Ta=70℃
Supply voltage	V_{CC}	V		±24		
Current consumption	I_{CC}	mA		33 + I_S		@±24V
Offset current	I_O	mA			±0.4	I_P =0@25℃
Offset current temperature drift	I_{OT}	A	±0.3		±0.6	-40℃…85℃
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
di/dt accurately followed	di/dt	A/μs		100		
Response time @ 90 % of I_{PN}	t_{ra}	μs			1	
Frequency bandwidth（-1dB）	BW	kHz		100		-3dB，small signal bandwidth

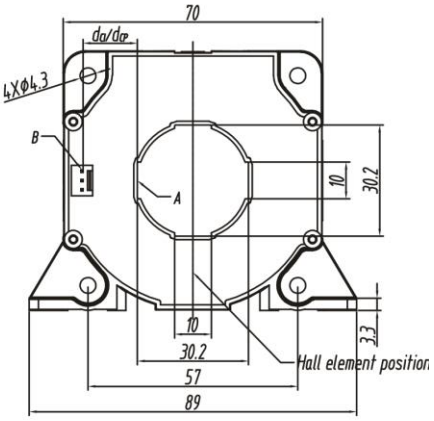
6. STB-500LF5 Dimensions

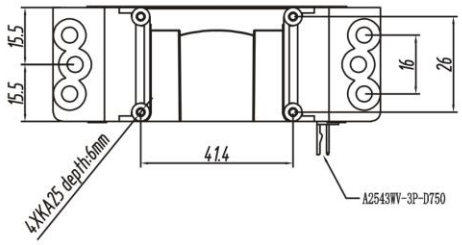


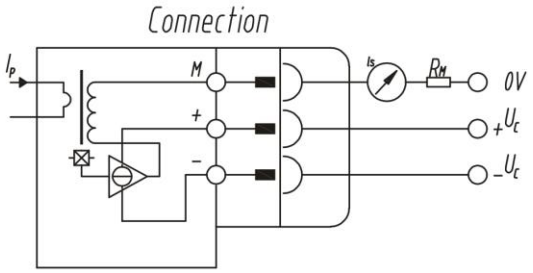
	da	dσ
A-B	14.6mm	15.6mm



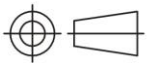




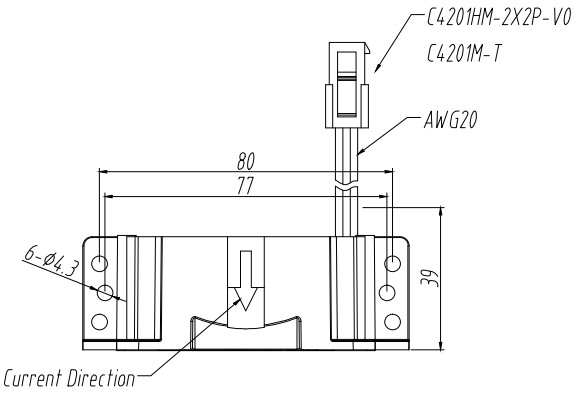


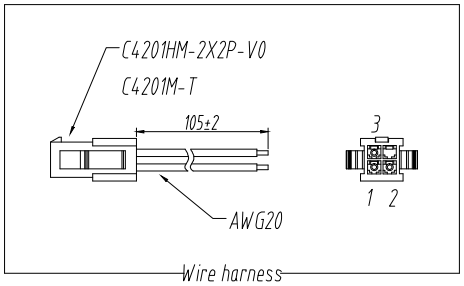


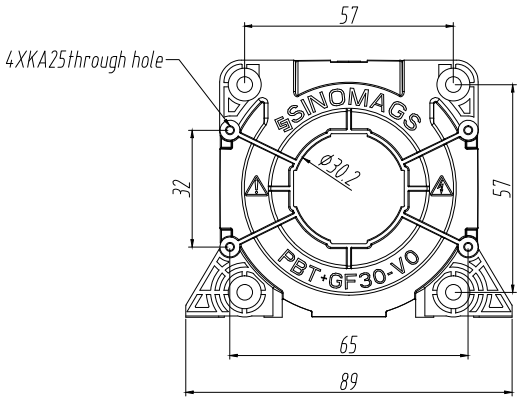
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm

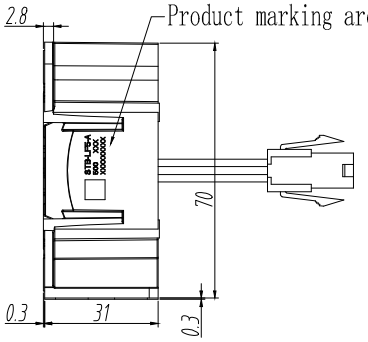


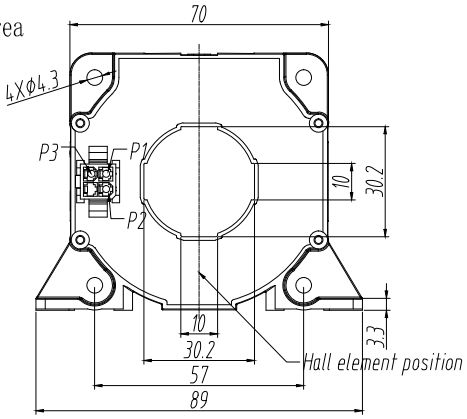
7. STB-500LF5-A Dimensions

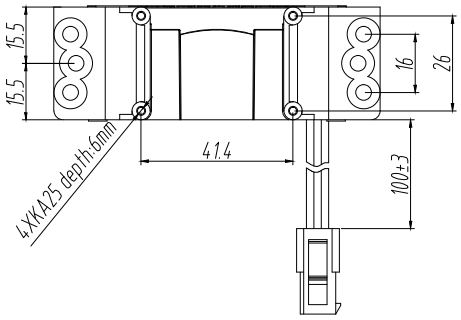


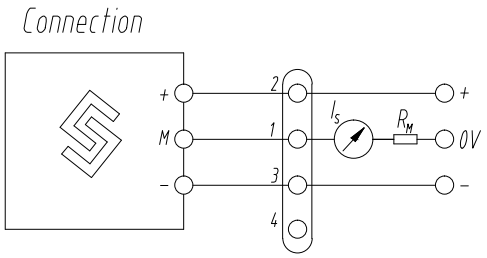










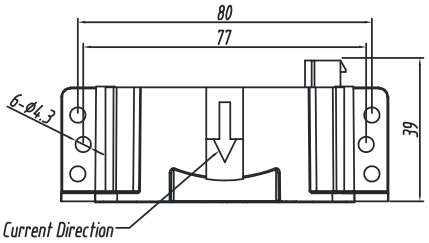


Secondary terminals

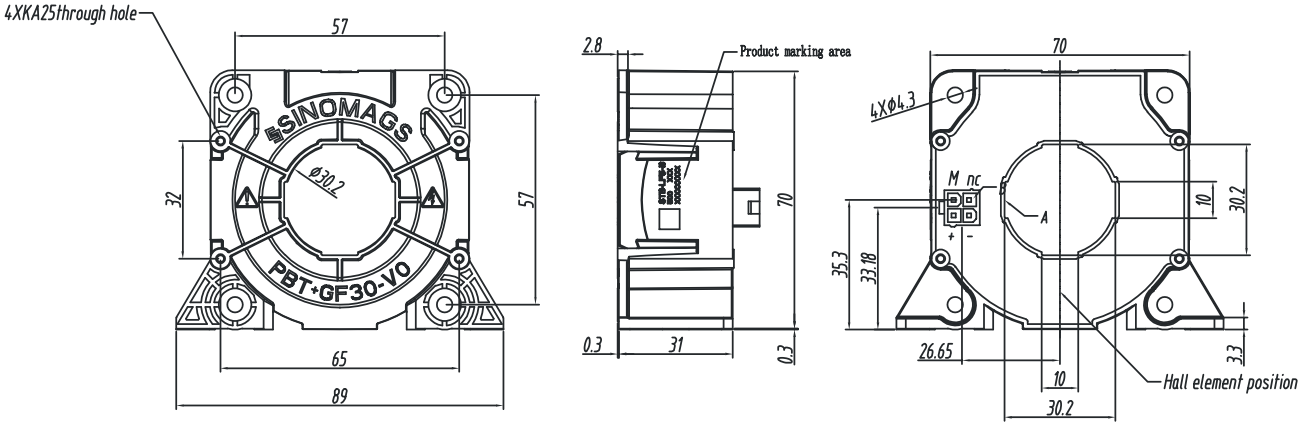
Pin 2 supply voltage + 15 V on AWG 20 connection (red)
Pin 1 measure on AWG 20 connection (black)
Pin 3 supply voltage - 15 V on AWG 20 connection (blue)
Pin 4 NC

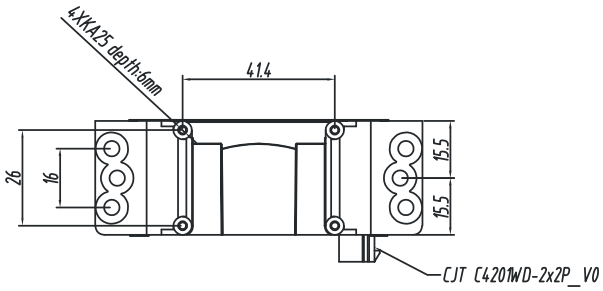
Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm

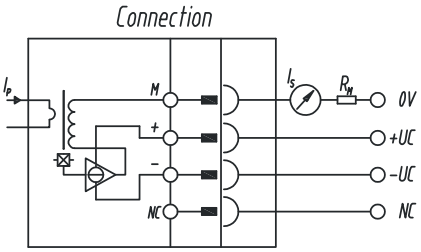
8. STB-500LF5-B Dimension



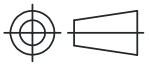
	d_{cl}	d_{cp}
A-B	8.5 mm	22.2 mm



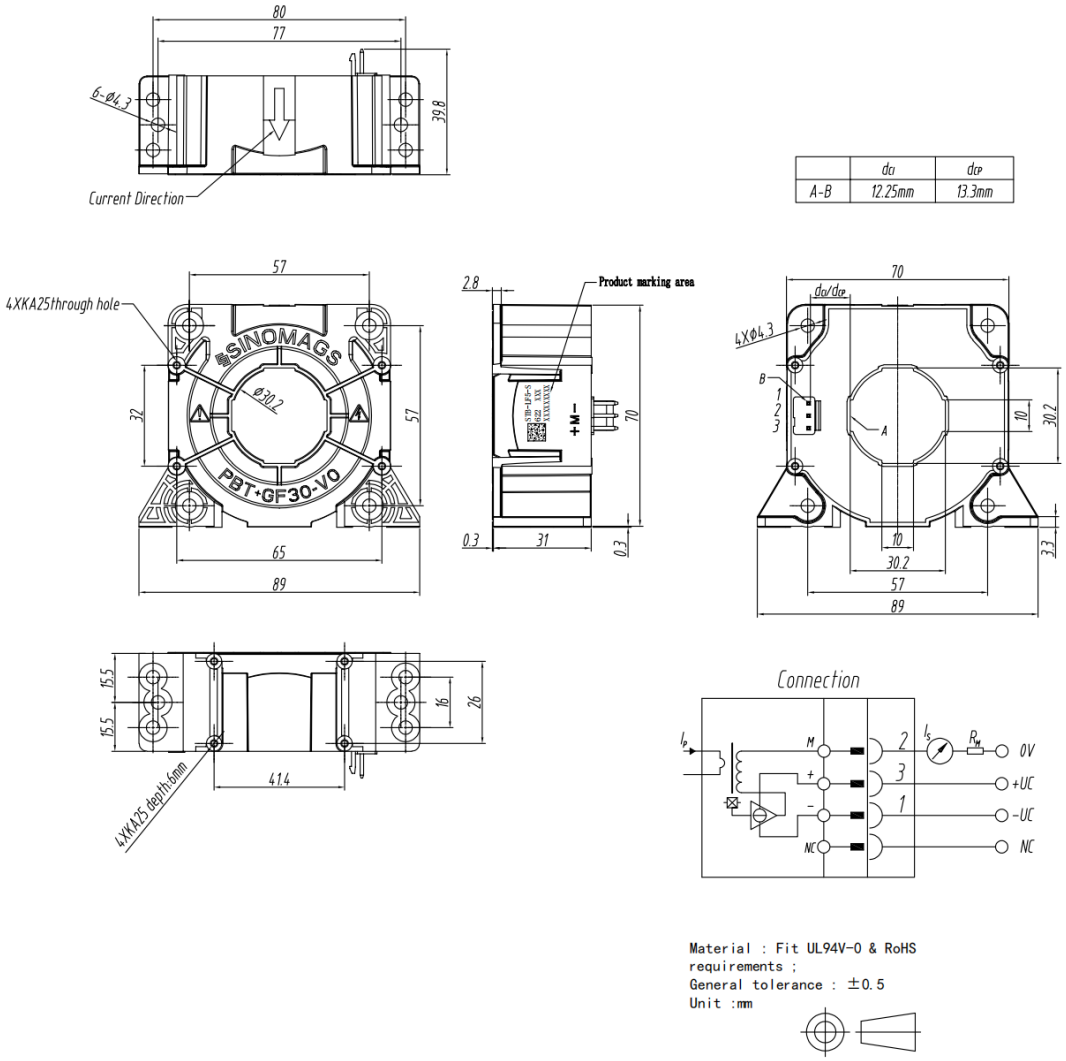




Material : Fit UL94V-0 & RoHS requirements ;
General tolerance : ±0.5
Unit :mm



9. STB-622LF5-S Dimension



	da	dcp
A-B	12.25mm	13.3mm

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

10. Mechanical characteristics

- General tolerance ±0.5 mm
- Transducer fastening
  Vertical position 6 holes ⌀ 4.3 mm
  6 M4 steel screws
  Recommended fastening torque 2.1 N·m(±10%)
- Primary through-hole ⌀ 30mm
  Or 30mm×10mm
- Transducer fastening
  Horizontal position 4 holes ⌀ 4.3 mm
  4 M4 steel screws
- Connection of secondary CJT A2543WV-3P-D750（STB-500LF5）
  CJT C420HM-2X2P-V0、C4201M-T(STB-500LF5-A)
  CJT C4201WD-2x2P-V0（STB-500LF5-B）
  CJT A3963WV-3P（STB-622LF5-S）