



Customer P/N:		Toneluck P/N:	L50CD-SB93A2-01	Page:	1 / 6
Project Code:		Product Version:	A1	Issued Date:	3/30/2017

File/Edition:L50CD-SB93A2-01-SPC.001

Description: Miniature Quick Switch

Customer Name: _____ Model No.: L (Series)

Customer P/N: _____ Toneluck P/N: L50CD-SB93A2-01

Representative: _____ Project Code: _____

Specification Receipt Confirmation

Received by: _____ Title: _____

Signature: _____ Date: _____

Remark :

- 1.This Product Specification is considered as the technical agreement between the receiving customer and TONELUCK. Any information on the general Product Catalogue which is in conflict with or different from the corresponding information of this document is considered as invalid.
- 2.If customer issue purchase orders without confirmation by signature of this specification after receipt, such confirmation will be considered as granted upon receipt of the first purchase order.

Prepared by: Leonard Li 2017-3-29

Checked by: Blue Lan 2017-3-29

Approved by: Ray Xu 2017-3-29



Customer P/N:		Toneluck P/N:	L50CD-SB93A2-01	Page:	2 / 6
Project Code:		Product Version:	A1	Issued Date:	3/30/2017

1. General Characteristics

- 1.1 Application : This specification is applied to the miniature quick switch for general applications.
- 1.2 Operating Temperature Range : Refer to individual product drawing.
- 1.3 Operating Relative Humidity : $\leq 96\%RH$ at $+40^{\circ}C$
- 1.4 Test Conditions : Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows :
- Ambient Temperature : $5\sim 35^{\circ}C$
 - Relative Humidity: $45\sim 85\%$
 - Air Pressure : $86\sim 106kPa$ ($860\sim 1060mbar$)

2. Appearance, Structure & Dimensions

- 2.1 Appearance : The switch shall have good finishing, and no rust, crack or plating defects.
- 2.2 Structure & Dimensions : Refer to individual product drawing.
- 2.3 Markings : Refer to individual product drawing.
- 2.4 Approved by Standards: Refer to individual product drawing.

3. Ratings & Life

Rating	Operating Life with Load	Operating Life without Load
Refer to individual product drawing.		

4. Electrical Characteristics

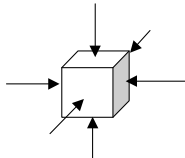
Item	Criteria	Test Method
4.1 Insulation Resistance	100M Ω Min.	500 \pm 50VDC voltage is applied between all terminals and between terminals and ground (frame) for 60 \pm 5s.
4.2 Dielectric Voltage	No dielectric breakdown shall occur.	1000VAC (50~60Hz, cut-off current 10mA) is applied between non-connected terminals and 1500VAC (50~60Hz, cut-off current 10mA) between terminals and ground (frame) for 60 \pm 5s.

5. Mechanical Characteristics

Item	Criteria	Test Method
5.1 Operating Force	Refer to individual product drawing.	Apply a tension meter on the midpoint of the actuator (or tip of the shaft) to supply a pressure vertically from its free position to operating position.
5.2 Operation Position	Refer to individual product drawing.	When switch is being converted, the distance between the actuator midpoint (or tip of the shaft) and the center of mounting hole.
5.3 Pre Travel	Refer to individual product drawing.	The distance vertically through which the midpoint of the actuator (or tip of the shaft) trip move from its free position to operating position.
5.4 Movement Differential travel	Refer to individual product drawing.	The distance vertically through which the midpoint of the actuator (or tip of the shaft) trip move from its operating position to releasing position.
5.5 Terminal Strength	- Shall be free from terminal looseness, damage and insulator breakage. - The electrical performance requirements specified in section 4 shall be satisfied.	A static load of 89N shall be applied to the tip of terminal in a desired direction for 10 \pm 1s. The test shall be done once per terminal.



Customer P/N:		Toneluck P/N:	L50CD-SB93A2-01	Page:	3 / 6
Project Code:		Product Version:	A1	Issued Date:	3/30/2017

5.6	Vibration Proof	<p>After test,</p> <ul style="list-style-type: none"> - Insulation Res.: 50MΩ Min. - Electrical performance requirements specified in item 4.2 shall be satisfied. - Operating force: Within ±10% of specified value. - No abnormalities shall be recognized in appearance and construction. 	<p>Switch shall be secured to a testing machine by a normal mounting device and method. Switch shall be measured after following test.</p> <ol style="list-style-type: none"> (1) Vibration frequency range = 10~55 Hz (2) Total amplitude = 1.5mm (3) Sweep ratio: 10~55~10Hz Approx. 1 min. (4) Method of changing the sweep vibration frequency: logarithmic or linear (5) Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours @ (6 hours in total)
5.7	Mechanical Shock	<p>After test,</p> <ul style="list-style-type: none"> - Insulation Res.: 50MΩ Min. - Electrical performance requirements specified in item 4.2 shall be satisfied. - Operating force: Within ±10% of specified value. - Shall be free from mechanical abnormalities. 	<p>Switch shall be measured after following test :</p> <ol style="list-style-type: none"> (1) Mounting Method: Normal (2) Acceleration: 98m/s² (10G) (3) Duration: 11 ms (4) Test Direction: 6 directions  <p>(5) Number of shocks: 3 times per direction (18 times in total)</p>

6. Durability Characteristics

Item	Criteria	Test Method
6.1 Operating Life without Load	<p>After test,</p> <ul style="list-style-type: none"> - Insulation Res.: 50MΩ Min. - Electrical performance requirements specified in item 4.2 shall be satisfied. - The switch shall be free from abnormalities in appearance & construction. 	<p>The operation shall be performed continuously at a rate of 200~300 cycles per minute without any load. (The cycles of operation refer to individual product drawing)</p>
6.2 Operating Life with Load	<p>After test,</p> <ul style="list-style-type: none"> - Insulation Res. : 50MΩ Min. - Dielectric Voltage shall comply with corresponding standard. - Operating force shall be within ±20% of specified value. - The switch shall be free from abnormalities in appearance & construction. 	<ol style="list-style-type: none"> ① According to UL1054, Switch shall be operated Corresponding cycles with load .(The load refer to individual product drawing) ② According to IEC61058.1, Switch shall be operated Corresponding cycles with load. (The load refer to individual product drawing)

7. Weather Proof Characteristics

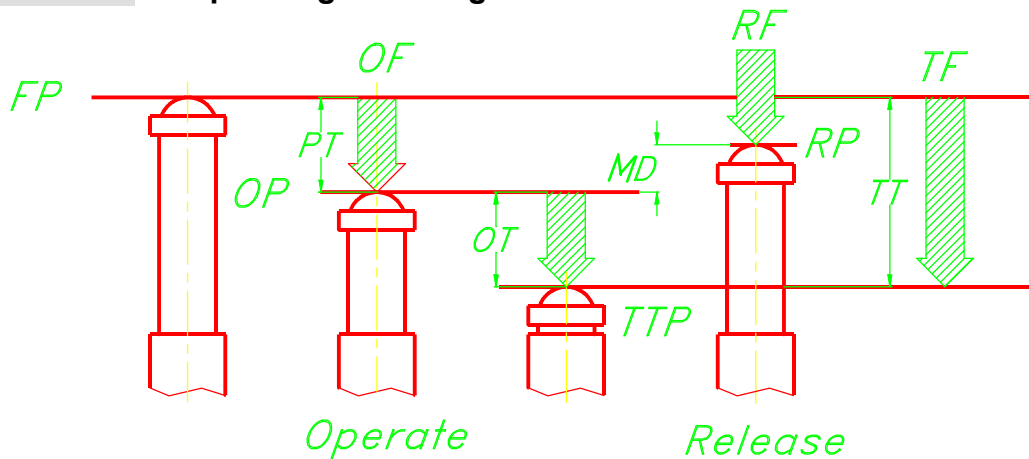
Item	Criteria	Test Method
7.1 Cold Proof	<p>After test,</p> <ul style="list-style-type: none"> - Insulation Res. : 50MΩ Min. - Electrical performance requirements specified in item 4.2 shall be satisfied. 	<p>After testing at -40±3°C for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated.</p>
7.2 Hot Proof	<ul style="list-style-type: none"> - Operating force shall be within ±10% of specified value. - The switch shall be free from abnormalities in appearance & construction. 	<p>After testing at 105±2°C for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that.</p>



Customer P/N:		Toneluck P/N:	L50CD-SB93A2-01	Page:	4 / 6
Project Code:		Product Version:	A1	Issued Date:	3/30/2017

7.3	Moisture Resistance		After testing at $40\pm 2^{\circ}\text{C}$, 90~95% RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated.
7.4	Temperature Cycling		<p>After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated.</p>

Note: Operating data diagram



- OF** : Operating Force
- RF** : Release Force
- TF** : Total travel Force
- FP** : Free Position
- OP** : Operating Position
- TTP**: Total Travel Position
- RP** : Release Position
- PT** : Pre Travel
- OT** : Over Travel
- MD** : Movement Differential Travel
- TT** : Total Travel



Customer P/N:		Toneluck P/N:	L50CD-SB93A2-01	Page:	5 / 6
Project Code:		Product Version:	A1	Issued Date:	3/30/2017

Special Notes:

1. Switch Mounting

(1) Switch Mounting

- Please use the screwdriver with torsional moment reading to tighten the switch, torsional moment shall be 4-6kg·cm.
- Mounting Holes graphics, Show as below:

<p>The graphics to mounting holes. 2-Φ3.1 dia. mounting holes or 2-M3 screw holes.</p>	<p>Notes of switch operation</p> <ul style="list-style-type: none"> ✓ Operation parts shall keep away from switch button, and enough spacing for motion is required. ✓ The specified over travel, which is the travel after switching, shall be advised to reach 60-90% of OT(Min.) after movement. ✓ Please negotiate with us in advance if inertial lash company with operation. ✓ Please take into account the operating force when you specified the location of operating parts.
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(2) Insulated wire used in switches mounting

Please pay attention to the spacing and border after matching wire, special insulation plate is available, that's recommended.

(3) Connecting wire to switch

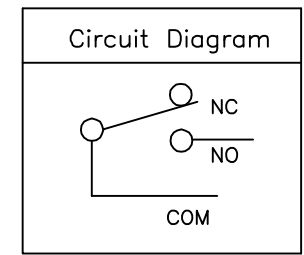
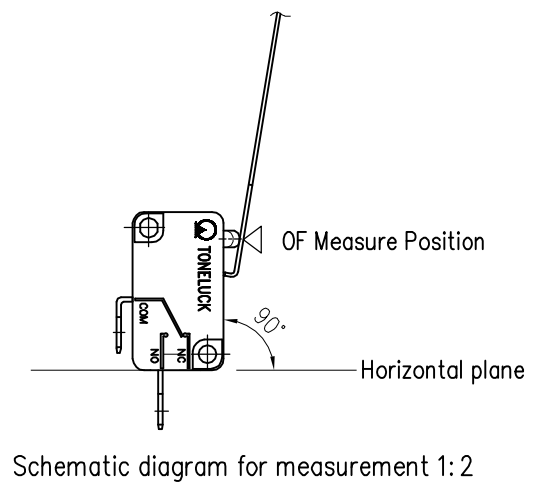
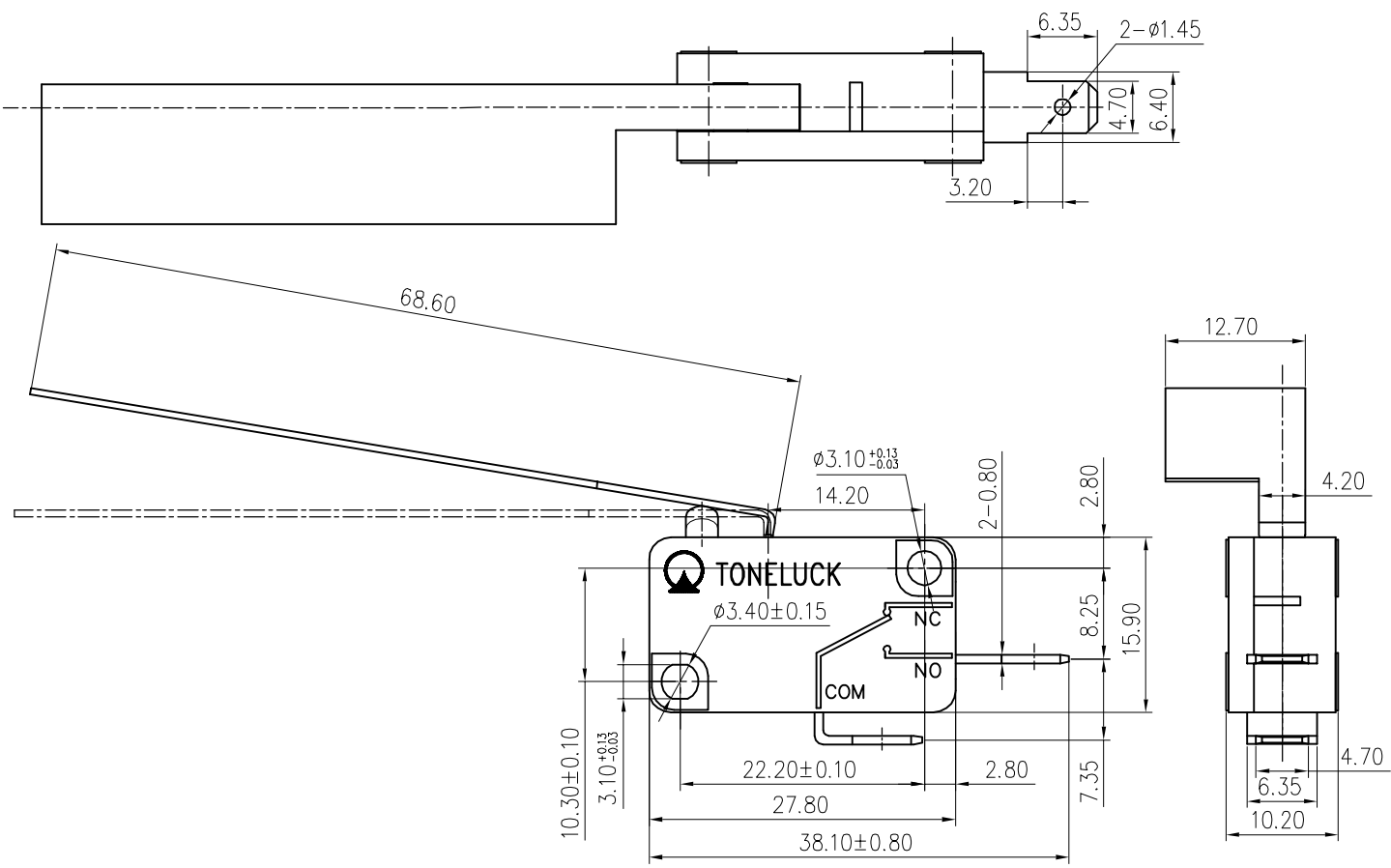
Select suitable socket and wire to connect to switch, confirm it is tightened totally. (Refer to the spec. of the drawing)

2. Deposition of switch

- Please keep away from polluted gas, organic gas (e.g. oil stove), dust and humidity.
- Storage temperature: 5~35°C; Humidity: ≤80%RH.

3. Using of switch

Don't fiercely fall and shock switch avoiding its inner component are damaged as it is microoperate-force product.



Mechanical Characteristics:	
Item	Criteria
Operating Force	20±12gf
Releasing Force	5gf Min.

Electrical Characteristics:	
Ratings	Operating Life
0.1A 125/250VAC; 0.1A 30VDC	100,000 cycles with load . (UL ,cUL)
0.1A 125/250VAC; 0.1A 30VDC	100,000 cycles with load . (ENEC)
Insulation Resistance: 100MΩMin	
Dielectric: 1000VAC(50~60HZ) - between non-connected terminals	
1500VAC(50~60HZ) - between terminals and ground - between terminals and non-live-metal parts	

Material List	
Aux Actuator(Lever)	Stainless Steel
Switch Base	Thermoplastics UL94 V-0
Switch Cover	Thermoplastics UL94 V-0
Terminals	Copper Alloy, Silver plated
Actuator	Thermoplastics UL94HB(Nature)
Contacts	Gold Alloy/Cu Alloy

Other Spec. :	
Operating Life Without Load:	1,000,000 cycles.
Operating Temperature Range:	-40℃~+105℃

MASS PRODUCTION RELEASE

REV.	DATE	MODIFICATION	ECN NO.	PRIOR VERSION
Project Ref: L SERIES MICROSWITCH		Tolerance Unless Otherwise Specified		
Part No: L50CD-SB93A2-01	-3	>3-10	>10-30	>30-80
Drawing No: - - -	Eng Ver: A1	±0.20	±0.30	±0.40
Drafted by: Leonard Li	Date: 2017-2-15	Unit: mm	Size: A4	Scale:
Checked by: Moon Lin	Date: 2017-2-15	THIRD ANGLE	TONELUCK	
Approved by: Ray Xu	Date: 2017-2-15	⊕ ⊞	Switches & Control Solutions	