

SPECIFICATIONS OF LUMISWITCH

1. General items

1-1 Scope: This specifications apply to Citizen Electronics' Lumiswitch, model LS38G2-T

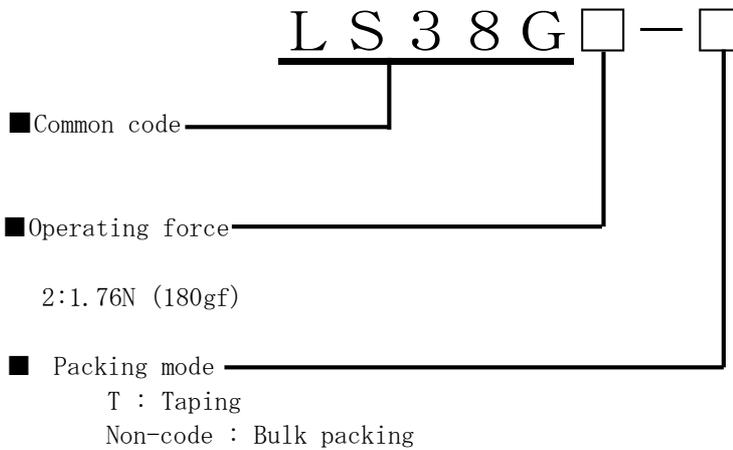
1-2 Dimensions : As per drawing attached

1-3 Circuit system : Single-pole, Single -throw

1-4 Operating temperature : - 3 0 ~ + 8 0 °C

1-5 Storage temperature : - 4 0 ~ + 9 0 °C

1-6 Parts code :



2. Rating

Maximum Rating for Switches : DC 12V, 20mA

MODIFICATION HISTORY					APPROVED	CHECKED	DRAWN	MODEL	LUMISWITCH
④					K. Ito 15.02.23	M. Miura 15.02.23	R. Wakuda 15.02.23	TYPE	LS38G2
③				DRAWING No.					
②									
①									
—									
MARK	QTY	DATE	DESCRIPTION	NAME	CITIZEN ELECTRONICS CO., LTD.				

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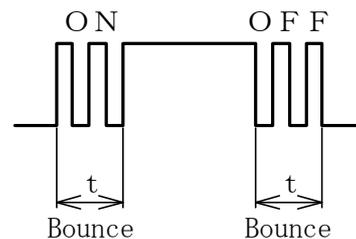
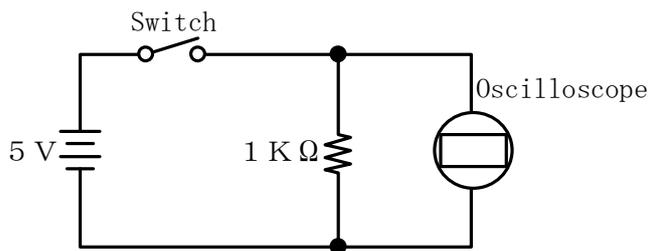
3. Initial characteristics

3-1 Mechanical characteristics

No.	Item	Performance	Test conditions
1	Operating force	1.76±0.49N (180±50gf)	Measure maximum operating force by vertically pressing down the center of push button gradually until it stops.
2	Operating stroke	0.15±0.07mm	Measure stroke by adding static force which is two times of standard value vertically to the center of push button until it stops.
3	Recovery force	0.39N more (40gf more)	Measure recovery force after vertically pressing down the center of push button to the extent of fill stroke.

3-2 Electrical characteristics

No.	Item	Performance	Test conditions
1	Contact Resistance	100m ohm or less	Add static force which is two times of standard value vertically to the center of push button and measure with 1000Hz micro-current measuring instrument.
2	Insulation resistance	100M ohm or more	Apply DC 100V to the terminals (except for terminals of LED), or there is a metal cover, between Terminals and the cover for 1 minute.
3	Withstanding voltage	No insulation Breakdown is Observed	Apply AC 250V (50Hz or 60Hz) between the terminals (except for terminals of LED), or if there is a metal cover, between terminals and cover for 1 minute.
4	Bounce strength	20ms or less	Push down lightly on the center of the actuator 2 times per second, and measure the bounce At time of ON and OFF. See figure below.

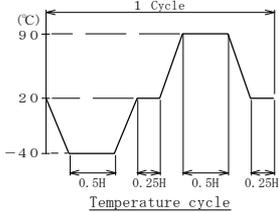


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4. Withstanding characteristics

4-1 Test conditions

No.	Item	Tests conditions
1	Operating life	Contact rating: 5mA at 12V DC, Stroke average: 2 times per seconds, Pressur force: the upper limit of the rated operating force, Life cycle: 0.1 milion actuation
2	Anti-heat	After exposure to ambient condition of $85\pm 2^{\circ}\text{C}$ for 96 hours, expose test pieces for one hour at normal temperature and humidity and measure at standard conditions. Neither deformation nor crack should be observed visually in mold part.
3	Anti-coldness	After exposure to ambient condition of $-40\pm 2^{\circ}\text{C}$ for 96 hours, expose test pieces at normal temperature and humidity for one hour and measure at standard conditions. Water drops should be taken off. Neither deformation nor crack should be observed visually in mold part.
4	Anti-humidity	After exposure to ambient condition of $60\pm 2^{\circ}\text{C}$ and 90 to 95% RH for 96 hours, expose test pieces at normal temperature and humidity for one hour and measure at standard conditions. Water drops should be taken off. Neither deformation nor crack should be observed in mold part.
5	Temperature cycle	Measure after performing 10 times of under temperature cycles. Water drops should be taken off. Neither deformation nor crack should be observed visually in mold part.  <p>The graph shows a temperature cycle starting at 20°C, dropping to -40°C (0.5H dwell), rising to 20°C (0.25H dwell), rising to 90°C (0.5H dwell), and finally dropping to 20°C (0.25H dwell). This sequence is labeled as '1 Cycle'.</p>
6	Anti-vibration	Total amplitude of 1.5mm, Vibration frequency 10 to 55Hz, Sweep 3ratio: 10-55-10Hz as one minute, Vibrating direction: X, Y and Z, Test hours is 6H, 2H for each directions.
7	Anti-shock	The accelerated velocity of the shock applied is 30G. The direction of shock is in X, Y and Z axes. The shock is applied three(3) times for each direction, a total of nine(9) times.
8	Stopper strength	Add static force of 29.4N (3kgf) vertically to the center of push button for 15 seconds.

※No abnormality should be observed both in electrically and mechanically for item No. 1~8.

4-2 Norm of judging failure of switch portion

Part Kind	No.	Judgment item	Sign	Norm for failure
Switch part	1	Operating force	Same as for initial Characteristics	$\pm 30\%$ or more of the initial value
	2	Contact resistance	Do	1000m Ω or more
	3	Insulation resistance	Do	10M Ω or less
	4	Bounce/Chattering	Do	30ms or more

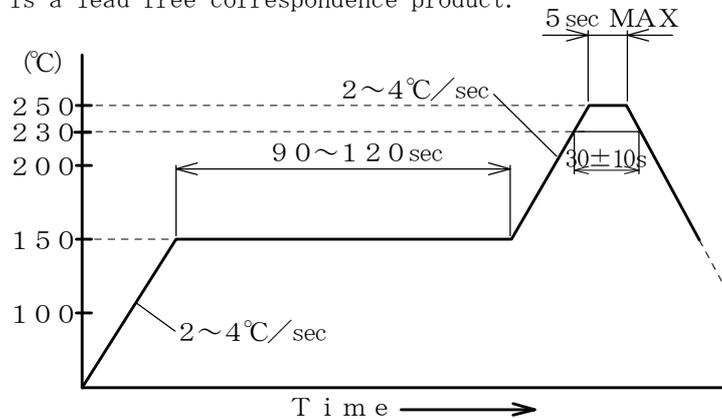
MODIFICATION HISTORY			APPROVED	CHECKED	DRAWN	Symbol	LUMISWITCH
\triangle			K.	M.	R.	Name	LS38G2
\triangle			Ito	Miura	Wakuda	DRAWING No.	
—			15.02.23	15.02.23	15.02.23		
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5. Condition for soldering

5-1. Reflow soldering

1. The solder paste is to be applied to the soldering pads by the dispenser or screen Printing.
2. In the case of screen printing the use of the metal mask of 0.15mm thick is recommended.
3. The use of the reflow furnace of upper and lower heaters type is recommended.
4. The temperature of the reflow furnace is to be set in accordance with the following temperature profile for the pre-heating and main heating. Care must be taken not to have the temperature at peak rise higher than 250°C. The temperatures in the following profile are the ones on the top surface of LUMISWITCH. As a difference in temperature between the top surface of LUMISWITCH and reflow furnace, close check is recommended. Care must be taken that LUMISWITCH be handled after its temperature has dropped down to the normal temperature after soldering.
5. Care must be taken that LUMISWITCH be handled after its temperature has dropped down to the normal temperature after soldering.
6. This product is a lead free correspondence product.



5-2. Manual soldering

1. The use of 6/4 solder or solder with silver (Ag) content is recommended.
2. Use a soldering iron of 20W or less and keep the temperature of the irontip to 350°C or less. Soldering should be kept to within 3 seconds just once for each
3. Care must be taken that LUMISWITCH be handled after temperature has dropped down to the normal temperature after soldering.

6. Definition of wording

6-1. “ The standard environment ” means the following. The tests and measurements are performed in the standard environment, unless otherwise stipulated.

1. Temperature … 20±15°C
2. Humidity …… 65±20%
3. Atmospheric pressure … 860~1060hPa.

6-2. “ No abnormality shall be observed in mechanical and electrical functions ” means that the test piece satisfies the level for judgement of failure as specified in 4-2.

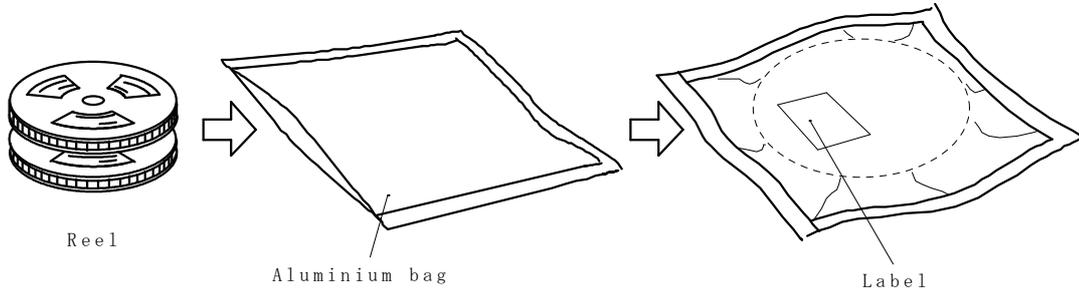
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7. Packing

7-1. Aluminum packing

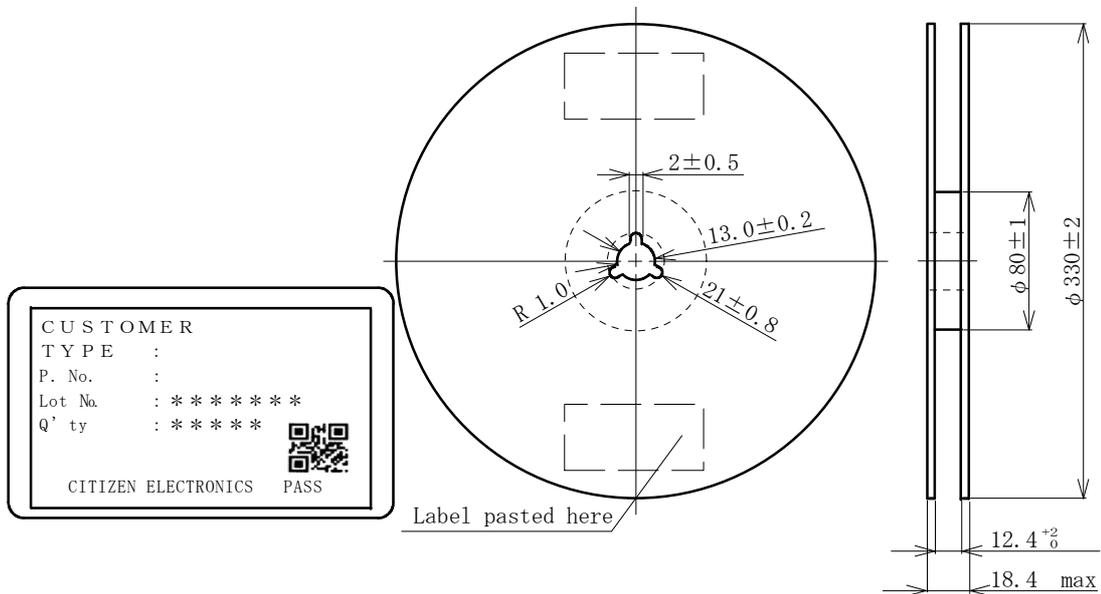
Switches are packed in the aluminum envelope to keep the initial product quality.



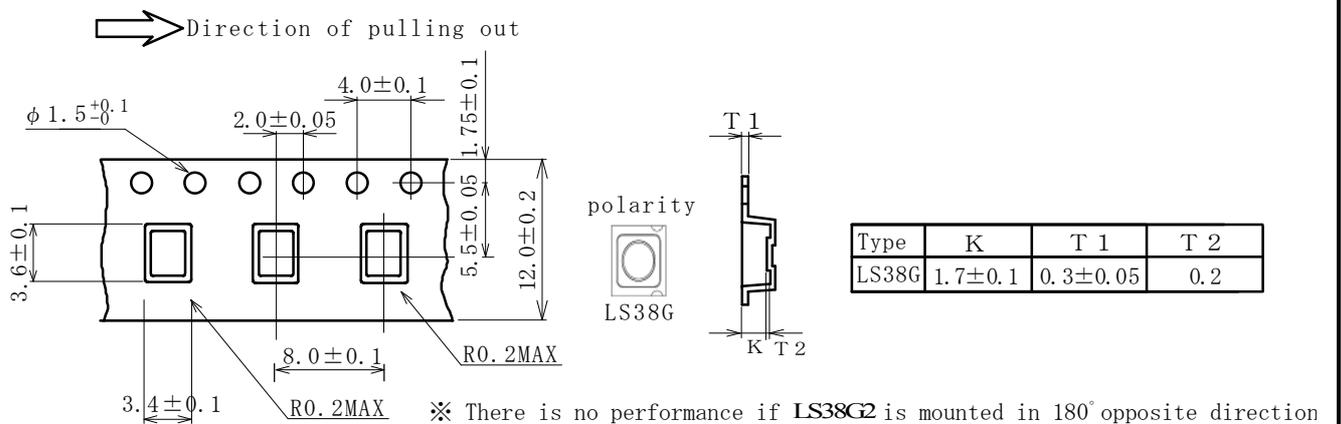
8. Taping specifications (In accordance with JIS C 0806-3)

8-1. Dimensions and shape

(Unit : mm)



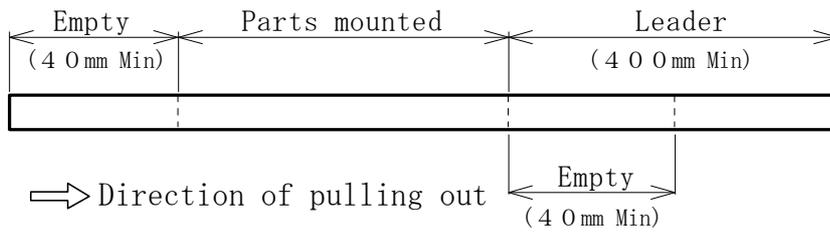
8-2. Dimensions of tape



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8-3. Configuration of tapes



8-4. Quantity (one pack)

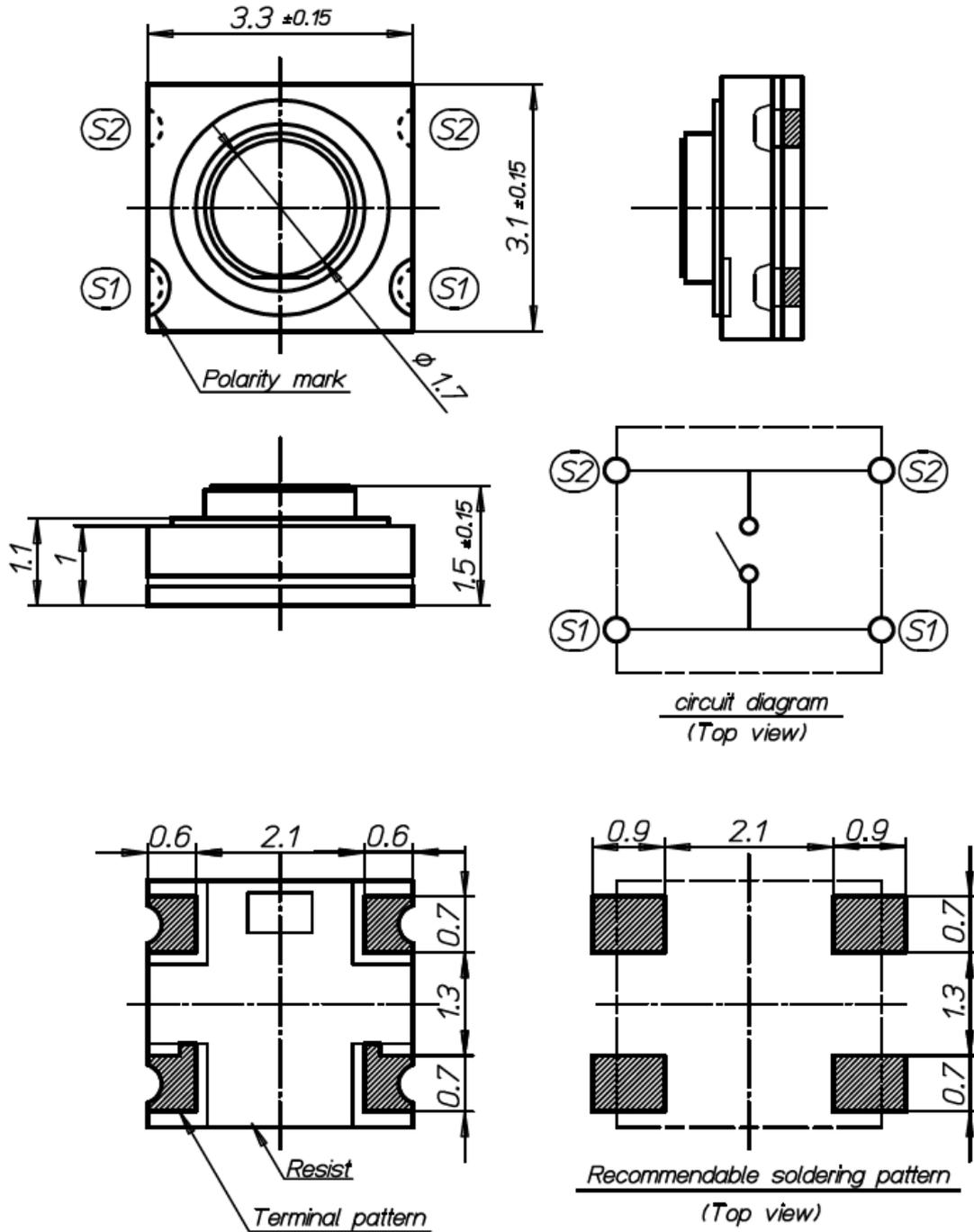
Reel /switch Article	LS38G2-T
φ 330	4,000 pieces × 2 Reel

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9. Outline drawing

Unit:mm
Tolerance: ±0.3



Note 1) The metal-mask thickness is to be designed with 0.15mm.

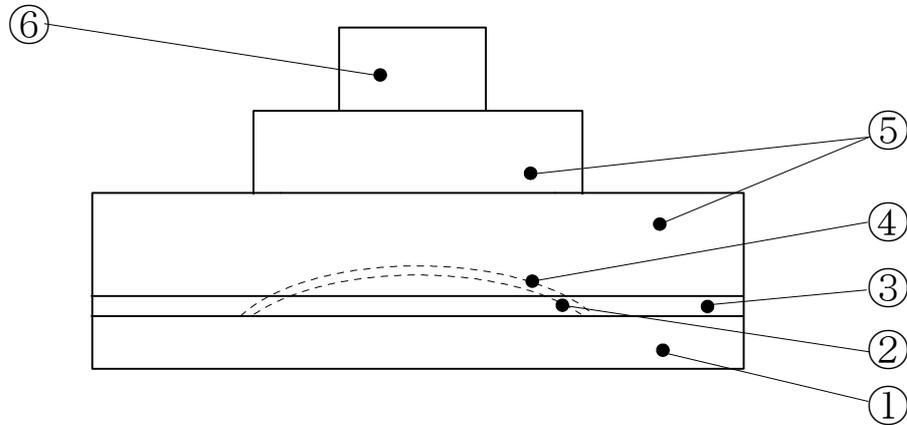
Note 2) Dimensions of the board resist pattern are to be designed based on outer dimensions of soldering pattern plus 0.15mm.

※ Finish of the pattern is Au-plating.

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10. Sectional plan



No.	Parts	Material/Specification	UL grade
1	Circuit board	FR-4	94V-0
2	Spring	Stainless steel strip	—
3	Adhesive sheet	Anti-heat polyimide resin	94V-0
4	Waterproof sheet	Anti-heat polyimide sheet	94V-0
5	Cover case	Poly phthalamide resin	94HB equivalent
6	Plunger	Poly phthalamide resin	94HB equivalent

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