

TL(L)□-6□□-S-□-V SPECIFICATION

FILE No.

REV.

Page

: E-V-AT10

: D

: 1 / 5

1. Style

This specification describes "TACTILE SWITCH", mainly used as signal switch of electric devices, with the general requirements of mechanical and electrical characteristic.

1.1 Operating Temperature Range : -25 °C ~+70°C

1.2 Storage Temperature Range : -30°C ~+80°C

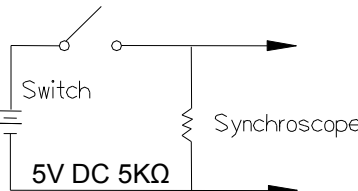
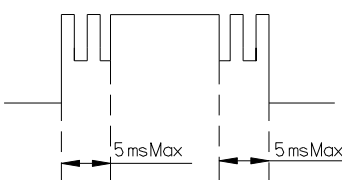
1.3 The shelf life of product is within 6 months.

2. **Current Range:** 50mA, 12V DC

Please refer LED rating from LED spec

3. **Type of Actuation:** Tactile feedback

4. **Test Sequence:**

	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
APPEARANCE	1	Visual Examination	By visual examination check without any out pressure & testing	There shall be no defects that affect the serviceability of the product.
	2	Contact Resistance	Applying a static load 1.5-2 times the operating force to the center of the stem, measurements shall be made with a 1 kHz small current contact resistance meter	100mΩ Max
ELECTRIC PERFORMANCE	3	Insulation Resistance	Measurements shall be made following application of 500 V DC potential across terminals and cover for 1 minute ± 5 seconds	100MΩ min
	4	Dielectric Withstanding Voltage	250 V AC(50Hz or 60Hz) shall be applied across terminals and cover for 1 minute	There shall be no breakdown or flashover
	5	Capacitance	1 MHz ±10 kHz	5 pF max.
	6	Bounce	3 to 4 operations at a rate of 1 cycles per second 	5 m seconds max. 

TL(L)□-6□□-S-□-V SPECIFICATION

FILE No.

REV.


Page

: E-V-AT10

: D

: 2 / 5

MECHANICAL PERFORMANCE

	7	Operating Force	Applied in the direction of operation 	100 ±50g [.98 ±.49N]	160 ±50g [1.568 ±.49N]	260 ±50g [2.548 ±.49N]	520 ±130g [5.1 ±1.27N]
	8	Stroke	Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the stem, the stroke distance for the stem to come to a stop shall be measured	0.20±0.10mm			
	9	Stop Strength	Placing the switch such that the direction of switch operation is vertical, a static load of 3 kgf (29.4N) shall be applied in the direction of stem operation for a period of 15 seconds	①As shown in item 4~7 ②Contact Resistance: 200mΩ Max ③Insulation Resistance: 10MΩ min			
	10	Solder Heat Resistance	■Through Hole Type ①Soldering Temperature:260±5℃ ②Duration of Solder Immersion: 5±1 seconds ③Frequency of Soldering Process 2 times max. (PCB is 1.6mm in thickness) ■SMT Type ~ Series(4/4)	①Shall be free from pronounced backlash and falling-off or breakage terminals ②As shown in item 4、5 ③ Contact Resistance: 200mΩ Max ④Insulation Resistance: 10MΩ min			
	11	Vibration	Shall be vibrated in accordance with Method 201A of MIL-STD-202F ①Swing distance=1.5mm ②Frequency: 10-55-10Hz in 1-min/cycle. ③Direction: 3 vertical directions including the directions of operation ④Test time: 2 hours each direction	①As shown in item 4~7 ②Contact Resistance: 200mΩ Max ③Insulation Resistance: 10MΩ min			
MECHANICAL PERFORMANCE	12	Shock	Shall be shocked in accordance with Method 213B condition A of MIL-STD-202F 1)Acceleration; 50G 2)Action time:11±1m seconds 3)Testing Direction: 6 sides 4)Test Cycle: 3 times in each direction	Ditto			

TL(L)□-6□□-S-□-V SPECIFICATION

FILE No.

: E-V-AT10

REV.

: D

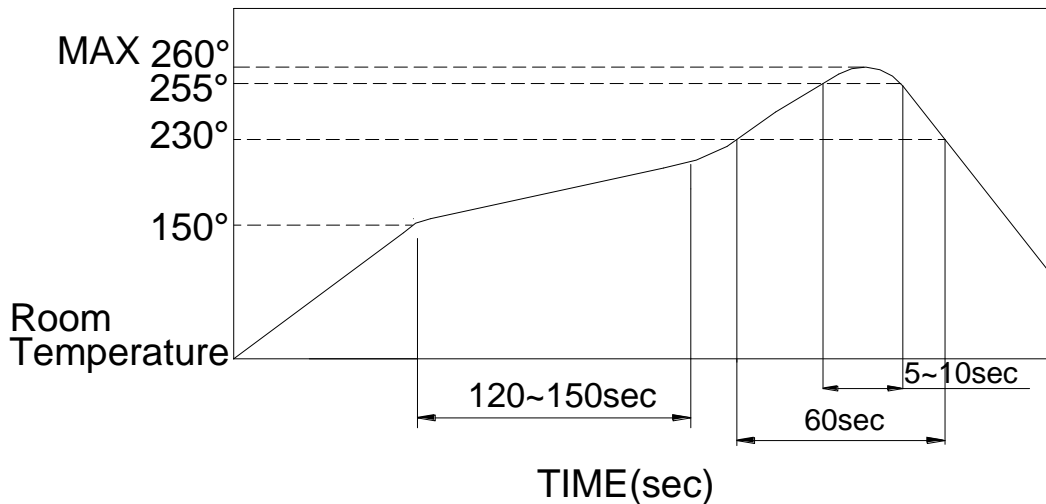
Page

: 3 / 5

MECHANICAL PERFORMANCE	13	Solderability	1)Through Hole Soldering Temperature : $245\pm 3^{\circ}\text{C}$ Lead-Free solder : M705E JIS Z 3282 A (Tin 96.5% , Silver 3% , Copper 0.5%) 2)Flux : 5~10 sec 3)Duration of solder Immersion : 5 ± 1 sec	No anti-soldering and the coverage of dipping into solder must more than 66% were requested.
	14	Operating Life	Measurements shall be made following the test forth below: 1)5mA,5 VDC resistive load 2)Applying a static load the operating force to the center of the stem in the direction of operation Static Load = OF Max. 3)Cycle of Operation: 500,000 cycles min~100 、160g 200,000 cycles min.~260g	1.As shown in item 4 、 5 2.Operating force: $\pm 50\%$ of initial force. 3.Contact Resistance: 10Ω Max 4.Insulation Resistance: 10MΩ min 5.Bounce: 10 m seconds Max
	15	Resistance Low Temperature	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 hour before the measurements are made: 1)Temperature: $-25\pm 3^{\circ}\text{C}$ 2)Time: 96 hours	①As shown in item 4~7 ②Contact Resistance: 200mΩ Max ③Insulation Resistance: 10MΩ min
WEATHER-PROOF	16	Heat Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 hour before the measurements are made: 1)Temperature: $80\pm 2^{\circ}\text{C}$ 2)Time: 96 hours	Ditto
	17	Humidity Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 hour before the measurements are made: 1)Temperature: $40\pm 2^{\circ}\text{C}$ 2)Relative Humidity: 90~95% 3)Time: 96 hours	Ditto

5. SOLDERING CONDITIONS:

■ Condition for Reflow Soldering – S.M.T Series

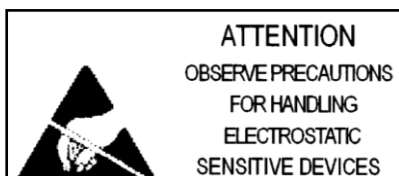


- The condition mentioned above is the temperature on the Cu foil of the PCB surface. There are cases where board's temperature greatly differs from switch's surface be used not to allow switch's surface temperature to exceed 260°C.
- Manual Soldering

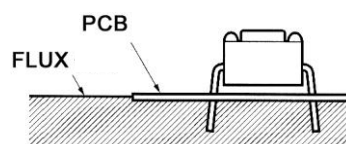
Soldering Temperature	Max.350°C
Continuous Soldering Time	Max. 5 seconds

■ Precautions in Handling

1. Care should be exercised so that flux from the upper part of the printed circuit board does not adhere to the switch.
2. Except for washable type do not wash the switch.
- 3.

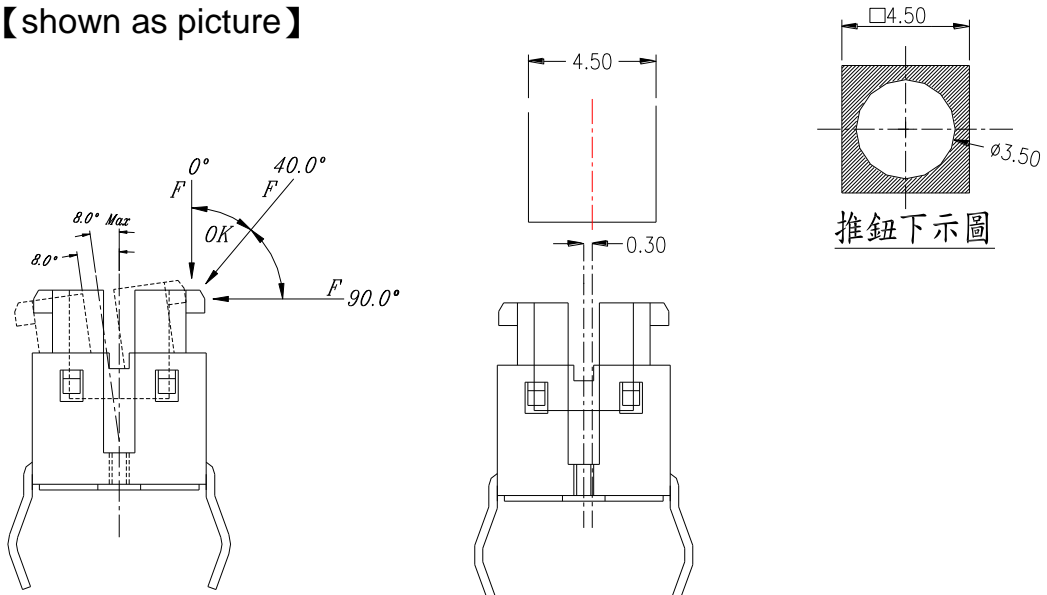


4. Please make sure that there is no flux rose over the surface of the PCB.



5. When the angle between the operation direction “F” and switch is over 40 degree (4 direction), there may be some concerns about the function.

【shown as picture】



6. After reflow, do not touch LED before cooling ,or it could influence LED function.
7. It is a normal material characteristic when whitening on plastic after reflow

■ Notes on storage conditions:

Do not store in the following environment or it may affect product's function and solderbility:

1. temperature of -10 (max) ~ +40 (min) °C & humidity at 85% (min)
2. environment with corrosive gas
3. storage over 6 months
4. place of direct sunlight

Store with proper packaging conditions and to avoid loading heavy force

We suggest to use the products within 3 months or at least 6 months.

After opening the package, the rest products must be stored in the appropriate moisture-proof & airtight environment

ITEM	DESC	Q'TY	METERIALS	TREATMENT	REMARK
1	STEM	1	HIGH-TEMP THERMOPLASTIC PA9T UL 94V-0	-	-
2	CONTACT	1	SUS301CSP-EH	With Silver Plating 0.5um min	-
3	BASE	1	HIGH-TEMP THERMOPLASTIC FR52 UL 94V-0	MOLDED BLACK	-
4	TERMINAL	1	BRASS	With Silver Plating	-
5	LED	1	—	NONE	-
6	TAPE	1	TEFLON	-	

TL L ☐ - 6 ☐ ☐ ☐ - ☐ - ☐ - ☐ - ☐


Package:
B=Tube
T/R= Tape & Reel (Only for S.M.T)
V=Lead Free

T= Tape (only for S.M.T)
☐ = Without Tape
S= Super Light


LED Color:
Please refer to the attached LED spec

LED Specification

A



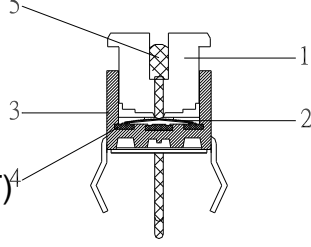
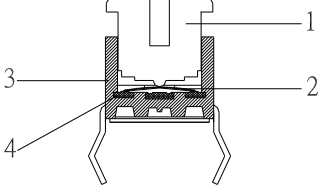
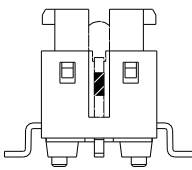
B



Operating Force
1=100g, Black
2=160g, Brown
3=260g, White
*5=520g, Salmon
(*only for Through Hole)

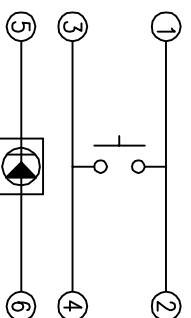
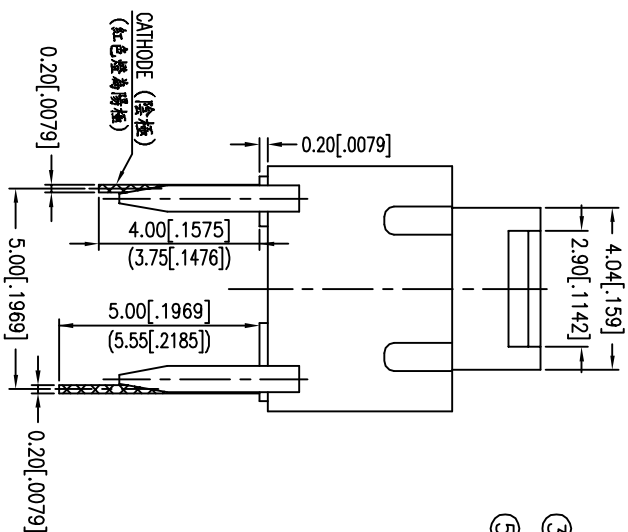
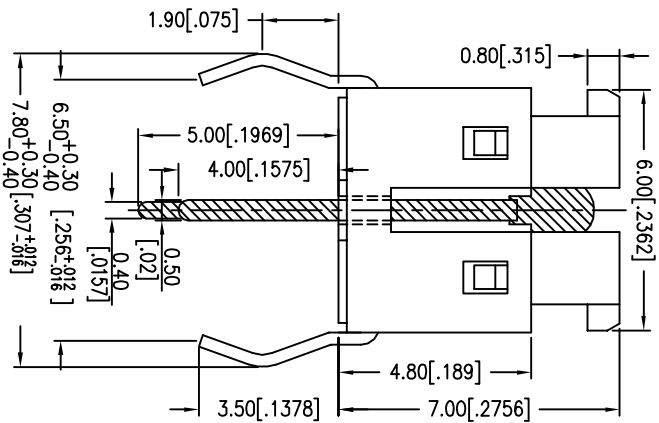
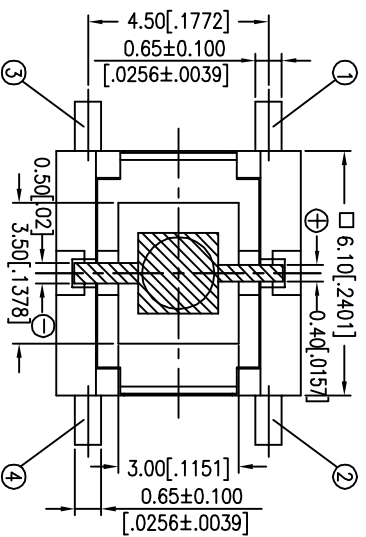
M= S.M.T
☐ = Through Hole
L= Tact Switch + LED

Tact Switch Type

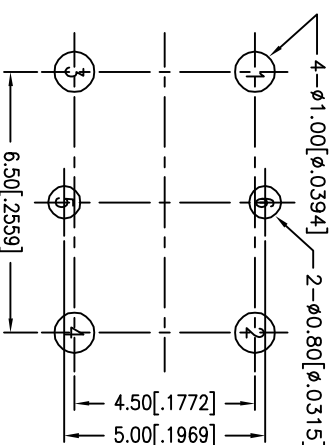




C	增加貼膠帶工站	
B	新增規格 TLLM	邱明義
A	DWG.REL	邱明義
REV.	ECO. NO.	APPD.

TITLE TACTILE SWITCH TYPE	APPD. :	
	CHKD. :	
PRROD. NO. : TL(L)□-6□□□-□-□-V-□	PR. : PAGGY	
FILE NO. : E-V-CT20	REV. : C	SHEET : 1/1



CIRCUIT DIAGRAM



P.C.B. LAYOUT

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS, BRACKETED
DIMENSIONS ARE IN INCHES.
2. GENERAL TOLERANCES MAX. ±0.20mm.

ZONE	REV	DESCRIPTION	DATE	APPD.
A	B	依訂(1005)新增0.520g f	10.05.05	
A	A	DWG. REV	02.18.05	邱明義

APPD.	P.TY.	SCALE: 8 : 1	圖達實業股份有限公司	PART NAME:
CHKD.	SCALE:	8 : 1	DIPTRONICS MANUFACTURING INC.	TLL-6 0000 -V
DR.	REV	UNITS	PART NO.	DWG NO.
10.05.05	B	mm	TLL-6000-S-V-B	TLL-B-S-V
02.18.05	Chien		FINISH	