Customer ¡ G

No :

Attention ¡ G

Date :

Your ref No ¡ G

Your Part No ¡ G

SPECIFICATION

MODEL ¡ G ACTING SWITCH A TYPE

Spec No ¡ G

Sample No. ¡ G

RECEIPT STATUS

RECEIVED

By Date

Signature

Name

Title

DSG'D Tsai Chia Hui

APP'D David Lee

ENG.DEPT.DIVISION

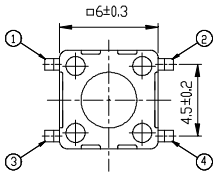
Sales

HUA JIE (TAIWAN) CORP.

7F-5,No.75, Sec.1, Hsin Tai Wu Rd.,

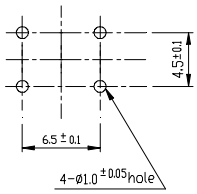
Hsi Chi, Taipei Hsien, Taiwan, ROC

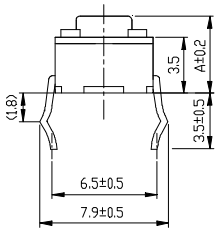
TACTING SWITCH SPECIFICATION

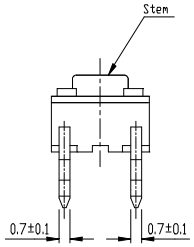


The length	Tolerance range
L ≤ 10	±0.3
10 < L ≤ 100	±0.5
100 < L	±0.6

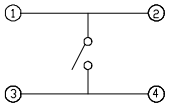
Printed circuit board mounting hole dimensions



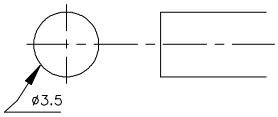
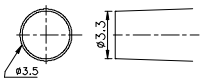
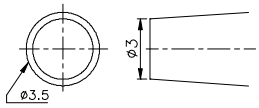




Circuit diagram



Scale:5:1

MODEL	DIM-A	STEM COLOR	ACTUATING FORCE(gf)	RETURN FORCE(gf)	STEM
TSAA-1	4.3	BLACK	100 ¡ 50	10 Min	
TSAA-2	4.3	GRAY	160 ¡ 50	50 Min	
TSAA-3	4.3	RED	260 ¡ 70	50 Min	
TSAA-4	4.3	GRAY	130 ¡ 50	50 Min	
TSAA-5	4.3	YELLOW	210 ¡ 50	50 Min	
TSAB-1	5.0	BLACK	100 ¡ 50	10 Min	
TSAB-2	5.0	GRAY	160 ¡ 50	50 Min	
TSAB-3	5.0	RED	260 ¡ 70	50 Min	
TSAB-4	5.0	GRAY	130 ¡ 50	50 Min	
TSAB-5	5.0	YELLOW	210 ¡ 50	50 Min	
TSAC-1	7.0	BLACK	100 ¡ 50	10 Min	
TSAC-2	7.0	DARK GRAY	160 ¡ 50	50 Min	
TSAC-3	7.0	RED	260 ¡ 70	50 Min	
TSAC-4	7.0	GRAY	130 ¡ 50	50 Min	
TSAC-5	7.0	YELLOW	210 ¡ 50	50 Min	

ZONE	SYMB	DATE	APPD	CHKD	DSGD

APPD	CHKD	DSGD
David Lee	Liao Kau Tao	Tsai Chia Hui

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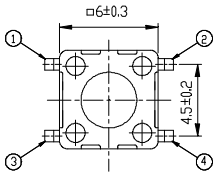
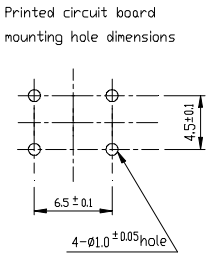
DOCUMENT NO:SPECTSA.DOC 1/9

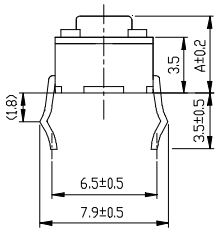
HUA JIE (TAIWAN) CORP.

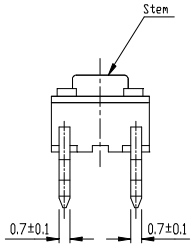
TACTING SWITCH SPECIFICATION

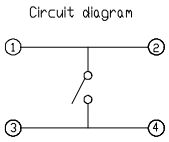


The length	Tolerance range
L ≤ 10	±0.3
10 < L ≤ 100	±0.5
100 < L	±0.6

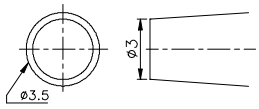
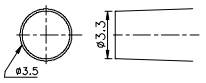
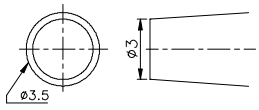








Scale:5:1

MODEL	DIM-A	STEM COLOR	ACTUATING FORCE(gf)	RETURN FORCE(gf)	STEM
TSAD-1	9.5	BLACK	100 ¡ 50	10 Min	
TSAD-2	9.5	GRAY	160 ¡ 50	50 Min	
TSAD-3	9.5	RED	260 ¡ 70	50 Min	
TSAD-4	9.5	GRAY	130 ¡ 50	50 Min	
TSAD-5	9.5	YELLOW	210 ¡ 50	50 Min	
TSAE-1	13	BLACK	100 ¡ 50	10 Min	
TSAE-2	13	DARK GRAY	160 ¡ 50	50 Min	
TSAE-3	13	RED	260 ¡ 70	50 Min	
TSAE-4	13	GRAY	130 ¡ 50	50 Min	
TSAE-5	13	YELLOW	210 ¡ 50	50 Min	
TSAF-1	17	BLACK	100 ¡ 50	10 Min	
TSAF-2	17	DARK GRAY	160 ¡ 50	50 Min	
TSAF-3	17	RED	260 ¡ 70	50 Min	
TSAF-4	17	GRAY	130 ¡ 50	50 Min	
TSAF-5	17	YELLOW	210 ¡ 50	50 Min	

ZONE	SYMB	DATE	APPD	CHKD	DSGD

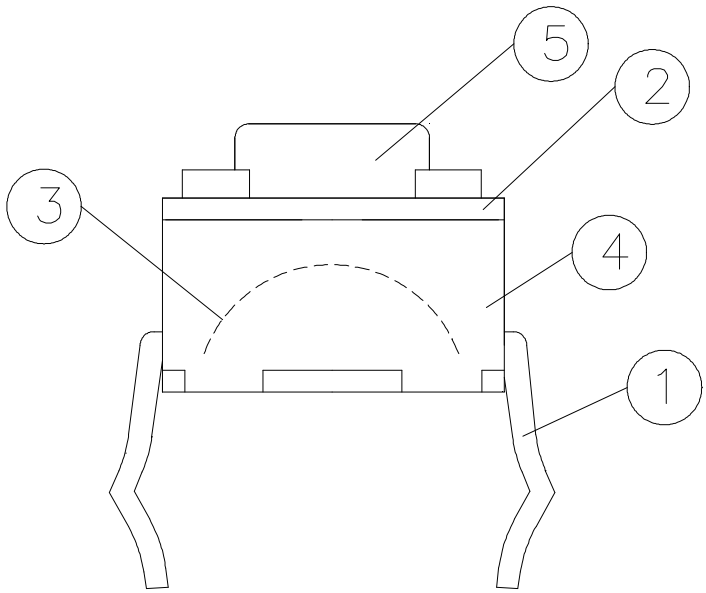
APPD	CHKD	DSGD
David Lee	Liao Kau Tao	Tsai Chia Hui

PART NO:TSA___ ¡ Ð ___

DOCUMENT NO:SPECTSA.DOC 1/9

HUA JIE (TAIWAN) CORP.

TACTING SWITCH SPECIFICATION



ITEM	COMPONETS	MATERIAL ARTICLE	SPECIFICATION	VENDOR
1	TERMINAL	BRASS STRIP SILVER CLOTHED	JIS C2680R-H Ag 1 £ g& Ag 0.5 £ g	FUJISAWA JAPAN
2	FRAME	STAINLESS STEEL OR TIN SHEET	JIS G3303 SPTE	N. K. K. TAIWAN AGENT
3	CONTACT	SILVER PHOSPHOR BRONZE STRIP	JIS C5210R-EH Ag 0.5 £ g	FUJISAWA JAPAN
4	HOUSING	P.B.T VALOX	G.F 15% E45587	G. E. AGENT
5	STEM	P.P.O NORYL	E45587	G. E. AGENT

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HUA JIE (TAIWAN) CORP.

TACTING SWITCH SPECIFICATION

1. GENERAL

1.1 Scope This specification covers the requirements for single key switches which have no keytop(TACT SWITCHES ¡ MECHANICAL CONTACT).

1.2 Operating Temperature Range

-20 to 70°C (normal humidity, normal press.)

1.3 Storage Temperature Range

-30 to 80°C (normal humidity, normal press.)

1.4 Test Conditions

Tests and measurements shall be made in the following standard conditions unless otherwise specified:

Normal temperature (temperature 5 to 35°C)

Normal humidity (relative humidity 45 to 85%)

Normal pressure (pressure 860 to 1060 m bars)

In case any question arises from the judgement made, tests shall be conducted in the following conditions:

Temperature (20±2°C)

Relative humidity (65±5%)

Pressure (860 to 1060 m bars)

2. APPEARANCE, STYLE, AND DIMENSIONS

2.1 Appearance

There shall be no defects that affect the serviceability of the product.

2.2 Style and Dimensions

Shall conform to the assembly drawings.

3. TYPE OF ACTUATION

Tactile feedback

4. CONTACT ARRANGEMENT 1 poles 1 throws

(Details of contact arrangement are given in the assembly drawings.)

5. MAXIMUM RATINGS DC 12 V 50 mA

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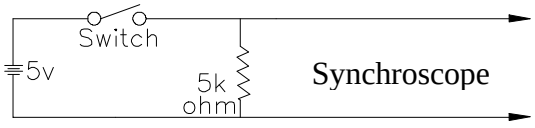
TACTING SWITCH SPECIFICATION

6. PERFORMANCE

6.1 Electrical

Item	Test Conditions	Requirements
6.1.1. Contact Resistance	Applying a static load twice the actuating force to the center of the stem, measurements shall be made with a 1 kHz small-current contact resistance meter.	100 m ohm max.
6.1.2. Insulation Resistance	Measurements shall be made following application of DC 100 V potential across terminals and across terminals and frame for one minute.	100 M ohm min.
6.1.3. Dielectric with-standing voltage	AC 250 V (50Hz or 60Hz) shall be applied across terminals and across terminals and frame for one minute.	There shall be no breakdown.
6.1.4. Bounce	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec.), bounce shall be tested at “ON” and “OFF”.  	5 m sec max.

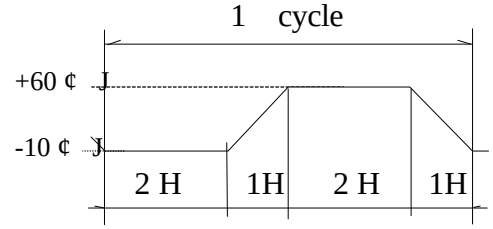
TACTING SWITCH SPECIFICATION

6.2 Mechanical

Item	Test Conditions	Requirements
6.2.1. Actuating Force	Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center of the stem, the maximum load required for the stem to come to a stop shall be measured.	_____ ± ____ g f
6.2.2. Travel	Placing the switch such that the direction of switch operation is vertical and then applying a static load twice the actuating force to the center of the stem, the travel distance for the stem to come to a stop shall be measured.	0.25 ± **0.2** **0.1** m m
6.2.3. Return Force	The sample switch is installed such that the direction of switch operation is vertical and, upon depression of the stem in its center the whole travel distance, the force of the stem to return to its free position shall be measured.	_____ g f min.
6.2.4. Stop Strength	Placing the switch such that the direction of switch operation is vertical, a static load of 3 kgf shall be applied in the direction of stem operation for a period of 60 seconds.	There shall be no sign of damage mechanically and electrically.
6.2.5 Stem Strength	Placing the switch such that the direction of switch operation is vertical, the maximum force to withstand a pull applied opposite to the direction of stem operation shall be measured.	3 k g f

TACTING SWITCH SPECIFICATION

6.3 Environmental

Item	Test Conditions	Requirements
6.3.1. Resistance to Low Temperatures	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1)Temperature: -30±2°C (2) Time: 96 hours (3)Water drops shall be removed.	Item 6.1 Item 6.2.1 Item 6.2.2
6.3.2. Heat Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1)Temperature: 80±2°C (2) Time: 96 hours	Item 6.1 Item 6.2.1 Item 6.2.2
6.3.3. Moisture Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1) Temperature: 60±2°C (2)Relative humidity: 90 to 95% (3) Time: 96 hours (4)Water drops shall be removed.	Contact resistance: 200 m ohm max. Insulation resistance: 10 M ohm min. Item 6.1.3 Item 6.1.4 Item 6.2.1 Item 6.2.2
6.3.4. Temperature Cycling	Following five cycles of the temperature cycling test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made. During this test, water drops shall be removed. 	Item 6.1 Item 6.2.1 Item 6.2.2

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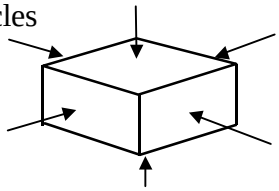
TACTING SWITCH SPECIFICATION

6.4 Endurance

Item	Test Conditions	Requirements
6.4.1. Operating Life	Measurements shall be made following the test set forth below: (1)DC 5V 5mA resistive load (2)Rate of operation: 2 to 3 operations per second (3)Depression: _____ g f (4)Cycles of operation: $10x10^4$ cycles	Contact resistance: 200 m ohm max. Insulation resistance: 10 M ohm min. Bounce: 10 m sec max. Actuating force: ¡ Ï30 % or ¡ Ð30 % of initial force Item 6.1.3 Item 6.2.2
6.4.2. Vibration Resistance	Measurements shall be made following the test set forth below: (1)Range of oscillation: 10 to 55 Hz (2)Amplitude, pk-to-pk:1.5 mm (3)Cycle of sweep: 10 -55 -10 Hz in one minute, approx. (4)Mode of sweep: Logarithmically sweep or uniform sweep (5)Direction of oscillation: Three mutually perpendicular directions, including the direction of stem travel (6)Duration of testing: 2 hours each, for a total of 6 hours	Item 6.1 Item 6.2.1 Item 6.2.2
6.4.3. Impact Shock Resistance	Measurements shall be made following the test set forth below: (1)Acceleration:80g (2)Cycles of test:3 cycles each in 6 directions, for a total of 18 cycles 	Item 6.1 Item 6.2.1 Item 6.2.2

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TACTING SWITCH SPECIFICATION

7. Switch Handling Precautions

7.1. In case an automatic flow soldering apparatus is used for soldering, adhere to the following conditions:

Item	Soldering condition
7.1.1 Preheat Temperature	100 ¢ Jmax (Ambient temperature of printed circuit board on its soldering side)
7.1.2 Preheat Time	45 sec max.
7.1.3 Flux Foaming	To such an extent that fluxes will be kept flush with the printed circuit board‘s top surface on which components are mounted. Preparatory flux must not be applied to that side of printed circuit board on which components are mounted and to the area where terminals located.
7.1.4 Soldering Temperature	255 ¢ Jmax.
7.1.5 Duration of Solder Immersion	5 sec. max.
7.1.6 Allowable Frequency of Soldering process	2 times max.

7.2 Other precautions

(1) Following the soldering process, do not try to clean the switch with a solvent or the like.

(2) Safeguard the switch assembly against flux penetration from its topside.

(3) Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods at most.

TACTING SWITCH SPECIFICATION

1. GENERAL

1.1 SCOPE

This specification covers the requirements for TSV series type of tact switches.

1.2 PACKING MATERIAL

ITEM	SUBSTANCE
CARTON BOX	CORRUGATED PAPER
PACKING CTN	CORRUGATED PAPER
PLASTIC BAG	NORMAL PLASTIC

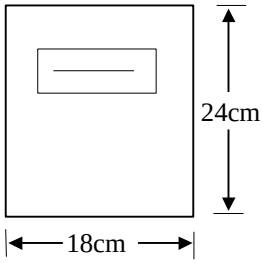
1.3 PACKING UNIT

1.3.1 The capacity of packing ctn.

Every carton box contains 4 packing ctn at most.
With a gross weight of 24 kgs around.

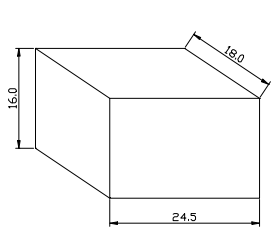
1.3.2 Every packing carton contains 10k pcs goods at most.
With a net weight of 3 kgs around.

1.4 Every plastic bag contains 2,000 pcs goods at most with a net weight of 550 g.

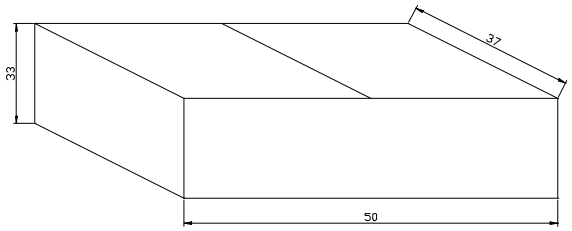


Pulling-out direction

1.5 THE SHAPE AND DIMENSION OF PACKING CARTON.



(PACKING CARTON)



(CARTON BOX)

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