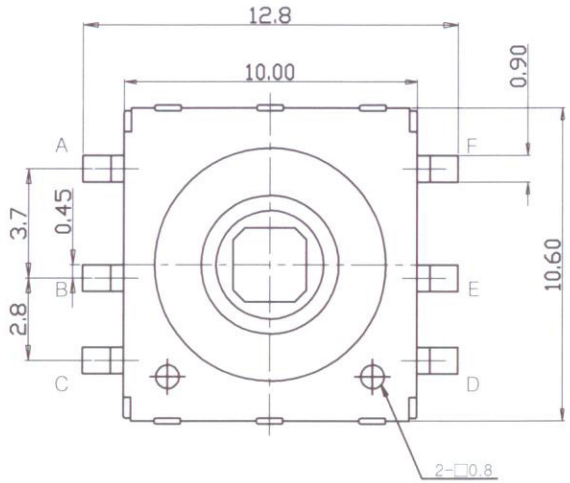
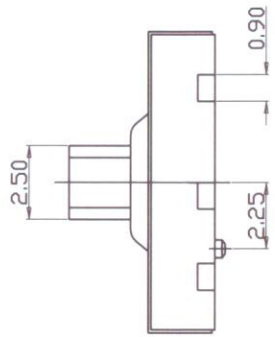
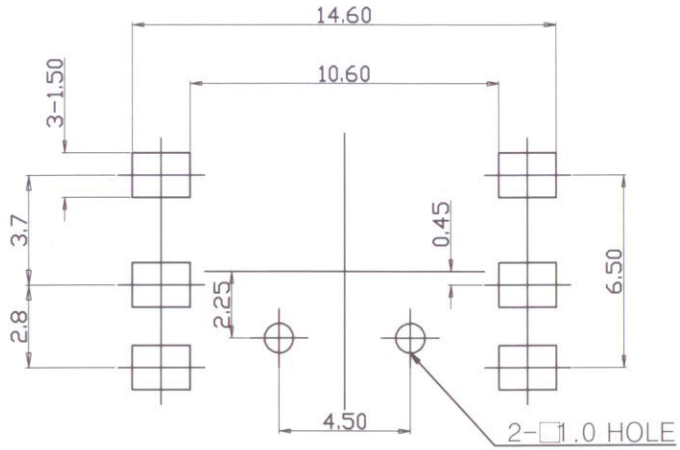
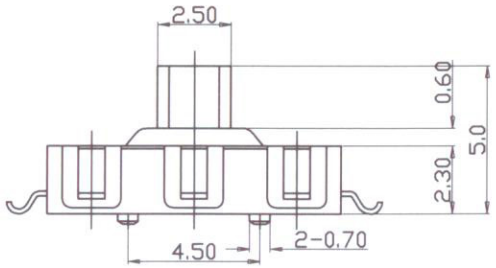
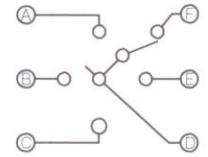






PCB PATTERN





CIRCUIT DIAGRAM

SPECIFICATION

1. RATING : DC 12V 50mA Max
2. STROKE CENTER PUSH : 0.2± 0.1mm
   4-Direction: 0.4± 0.1mm
3. CONTACT RESISTANCE : 100m
4. OPERATING FORCE :
   4-CIRCTINAL : 250 ± 30gf
   CENTER PUSH : 500 ± 70gf
5. OPERRATING ANGLE : 4
6. BOUNCE : 10msec
7. LIFE : 50,000 CYCLES
8. TOLERANCE : 0.3
9. H:5.0mm

PART NO	PART NAME	Q'TY	MATERIAL	STANDARD	DISPOSITION	REMARKS

TRIGON-OMETRY	UNIT	SCALE 5/1	MULTI WAY TACT SWITCH			
APPD	CHKD	DSGD				
NO	CORRECTION		MODEL	INT-1500S50B		

INNOCENT ELECTRONICS CO.,LTD.

PART LIST

DESIGN	CHECK	APPR

모델명(MODEL NO.) : INT-1500/1500S

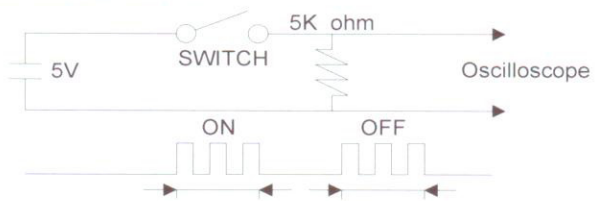
NO.	부품명 PART NAME	원재료명 MATERIAL NAME	원재료업체 MATERIAL MANUFACTURER	원산지 ORIGIN	도금 PLATING	색상 COLOR	비고 REMARKS
1	TERMINAL	C2680R-EH	POONGSAN METAL CO., LTD.	KOREA	Ag		
2	CASE	LCP(VECTRA E130i BLACK)	POLYPLASTICS CO., LTD.	JAPAN		Black	
3	CONTACT	SUS-301EH-Ag	POSCO CO.,LTD	KOREA			3Ø, 4-SIDE : 250gf CENTER : 2PCS, 500gf
4	GUIDE PLATE	C5210	CHANG-SUNG	KOREA		Yellow	
5	STEM	LCP(VECTRA E130i BLACK)	POLYPLASTICS CO., LTD.	JAPAN		Black	√ H : 5.0/7.0/9.0mm
6	MOVE STEM	LCP(VECTRA E130i BLACK)	POLYPLASTICS CO., LTD.	JAPAN		Black	√ H : 5.0/9.0mm
7	COVER	SUS 301 3/4-H	POONGSAN METAL CO., LTD.	KOREA			

TITLE	SPECIFICATION

1. General

1.1 Scope	This Specification describes the physical and electrical characteristics for a tact switch. It also defines test methods and sequencing for product qualification testing.
1.2 Operating temperature range	-20℃ ~ 70℃ (normal humidity, normal pressure)
1.3 Storage temperature range	-40℃ ~ 85℃ (normal humidity, normal pressure)
1.4 Test conditions	Test and measurements shall be made by the following conditions.
	Temperature : -5~35℃
	Relative humidity : 45~85%
	Air pressure : 86~106kPa (860~1060mbar)
	In case of questions for the judgment made, tests should be conducted by the following conditions.
	Temperature : 20±2℃
	Relative humidity : 60±5%RH
	Air pressure : 86~106kPa (860~1060mbar)
2. Appearance, construction and dimensions	
2-1. Appearance	There should be no defects that will degrade the switch's performance.
2-2 Construction and dimensions	Refer to individual product drawing.
3. Type of actuation	Push, tilting tactile feedback
4. Contact arrangement	1 poles 1 throws, 1 pole 4 throws
5. Maximum Rating	DC 12V ,50mA
6. Performance	

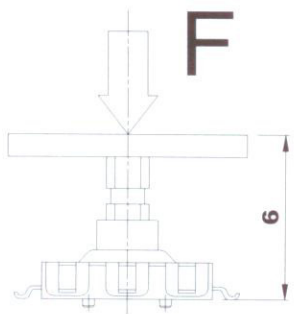
6-1 Electrical performance

	Items	Test conditions	Criteria
6.1.1	Contact resistance	Measurements shall be made by applying a static force which is 500gf actuating (push on and tilting such as FIG1 , FIG2) force with a 1KHz current contact resistance meter.	100mΩ MAX
6.1.2	Insulation resistance	Measurements shall be made by applying a current of 100V DC between terminals and frame or each terminals for one minute.	100MΩ MIN
6.1.3	Dielectric withstanding	A current of AC 500V (50Hz or 60Hz) shall be applied betweem terminals and frame or each terminals for one minute.	There should be no breakdown.
6.1.4	Bounce	Shall be tested during the transition of OFF to ON at a rate of three to four operations per second. 	10m Sec max

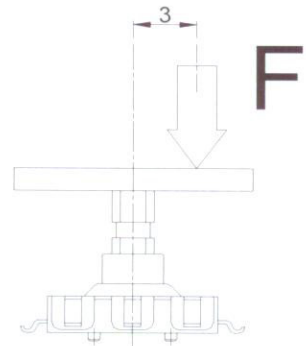
TITLE	SPECIFICATION

6-2. Mechanical performance

	Items	Test conditions	Criteria
6.2.1	Actuating force	Actuating force should be applied horizontal and vertical to the stem as shown in Fig1 , Fig2. When actuate the stem, force should be applied gradually.	Push on : 500±70gf Tilting : 250±50g
6.2.2	Stroke	The travel distance should be measured to the stem as shown in Fig1(Push on) and Fig2(Tilting). When actuate the stem force should be applied gradually.	Push on : 0.2±0.1mm Tilting : 0.4±0.1mm
6.2.3	Return force	The force of the stem to return to its free position shall be measured after actuating force is applied as shown in Fig1, Fig2.	Push on : 50gf Min Tilting : 20gf Min
6.2.4	Stop strength	A static load of 3Kgf is applied to the horizontal and vertical direction as shown in Fig1 and 2 for a period of 60 seconds.	There shall be no sign of damage mechanically and electrically.
6.2.5	Stem strength	A static load is applied to the pull direction there should be no damages.	500gf Min



Push on
Fig 1



Tilting
Fig 2

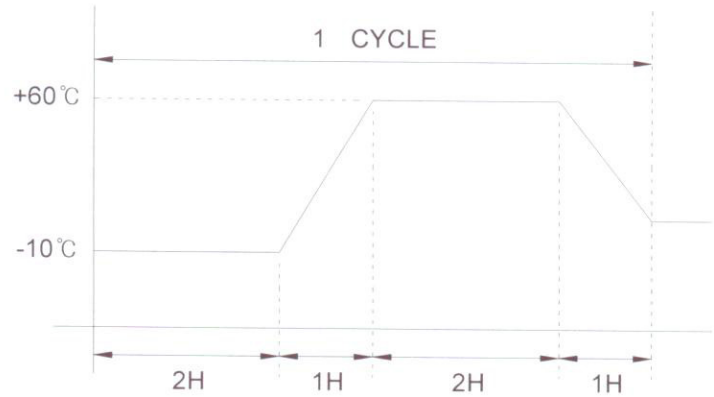
Note.

Really, an electrical signal processing be made 5° ~ 9° tilting degree even under the Maximum Tilting 12°

6-3. Environmental performance

	Items	Test conditions	Criteria
6.3.1	Resistance to low Temperature	When test being done under these condition , it should be tested after one hour leave in normal temperature and humidity. (1)Temperature : -40± 2℃ (2)Time : 96 hours (3)Water drops shall be removed	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
6.3.2	Heat resistance	When test being done under these condition , it should be tested after one hour leave in normal temperature and humidity. (1)Temperature : +85± 2℃ (2)Time : 96 hours	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
6.3.3	Moisture resistance	When test being done under these condition , it should be tested after one hour leave in normal temperature and humidity. (1)Temperature : +60± 2℃ (2)Relative humidity : 90 to 95% RH (3)Time : 96 hours (4)Water drops shall be removed	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3

TITLE	SPECIFICATION

	Items	Test conditions	Criteria
6.3.4	Temperature cycling	The test being conducted five times as shown in figure. It should be tested after one hour leave in normal temperature and humidity. During this test , water drops shall be removed.  	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
6-4. Endurance			
6.4.1	Operating life	Measurements shall be made by following the test set. (1)DC 5V 5mA resistive load. (2)Rate of operation : 2 to 3 operations per second. (3)Depression : 500gf Max (4)Cycle of operation : For each direction 50,000 cycles	Contact resistance :100mΩ Max. Insulation resistance :100MΩ Min. Bounce : 20m Sec Max Actuating force :±30% of initial force Item 6-1-3 , Item 6-2-2 Item 6-2-3
6.4.2	Vibration resistance	Measurements shall be made by following the test set. (1)Range of oscillation : 10 to 55Hz (2)Amplitude, peak-to-peak : 1.5mm (3)Cycle of sweep : 10-55-10Hz in one minute approximate. (4)Mode of sweep : Logarithmical 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 Item 6-2-3
6.4.3	Impact shock Resistance	Measurements shall be made by following the test set. (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 Item 6-2-3

7.Materials

1) HOUSING (CASE)	: LCP
2) COVER	: SUS
3) ACTUATOR 1 (STEM 1)	: LCP
4) ACTUATOR 2 (STEM 2)	: LCP
5) CONTACT	: SUS WITH SILVER-PLATING
6)GUIDE PLATE	:C5210R

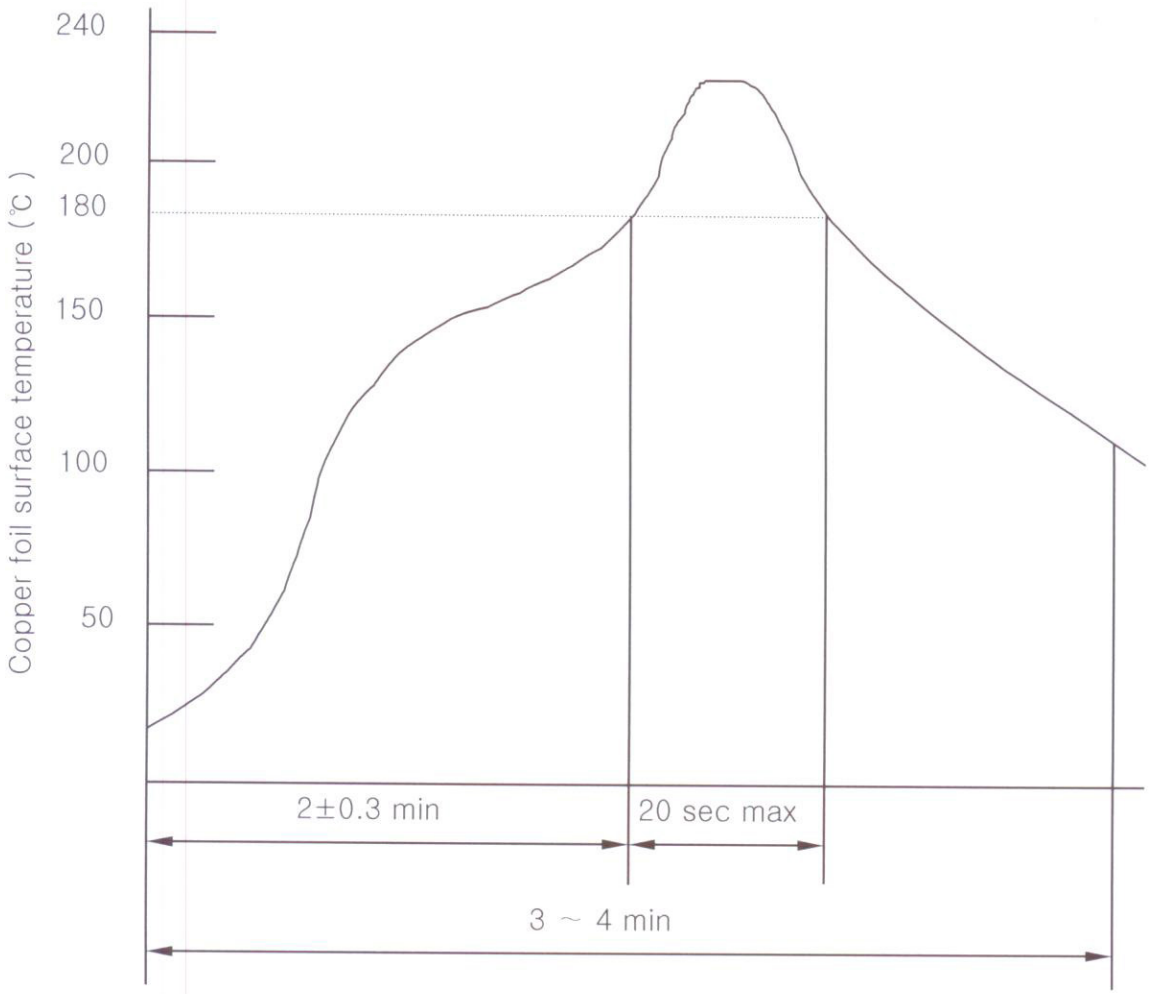
TITLE	SPECIFICATION

8. Soldering

Reflow soldering conditions

Preheat : termperature on the copper foil surface should reach 180℃, 2±0.3 minutes after the P.W.P entered into the soldering equipment.

Soldering heat : Temperature on ther copper foil surface should reach the peak temperature of 240℃ within 20 seconds after the P.W.B entered into soldering heat zone.



Temperature Profile

DATE	2008,	APPROVED	CHECKED	DESIGNED	PAGE
S/W TYPE	MULTI DIRECTIONAL S/W				4 / 4
MODEL NO.	INT-1500S	K SH			
DOCUMENT NO.		/ /	/ /	/ /	