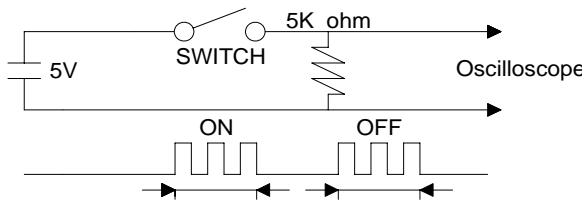
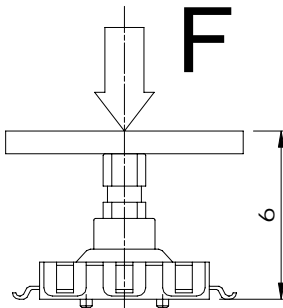
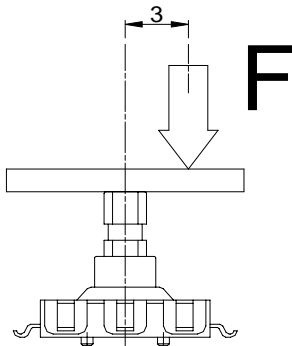
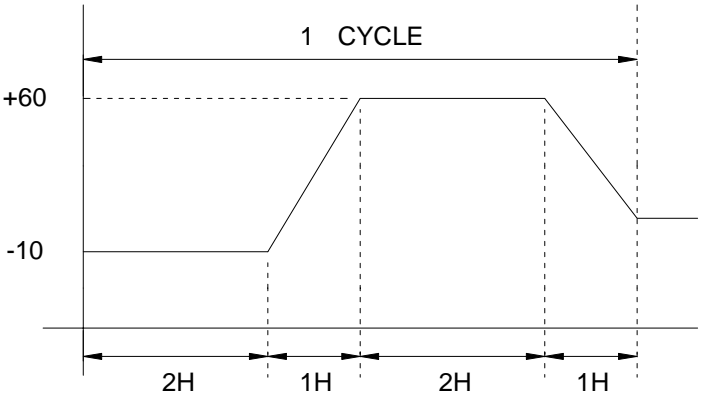


TITLE		PRODUCT SPECIFICATIONS									
MODEL No.		TACT SWITCHES (MT 1500S TYPE)							PAGE		
									1/4		
1. General											
1.1 Scope		This Specification describes the physical and electrical characteristics for a tact switch. It also defines test methods and sequencing for product qualification 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 350gf actuating (push on and tilting such as FIG1 , FIG2) force with a 1KHz current contact resistance meter.							500MΩ 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 between 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		
											
								APPD.	CHKD.	DSGE.	

TITLE		PRODUCT SPECIFICATIONS	
MODEL No.	TACT SWITCHES (MT 1500S TYPE)		PAGE 2/4
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 : 250±80gf Tilting : 110±70g
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 : 0.5±0.2mm
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
<div><div><p><b>Push on</b> <b>Fig 1</b></p></div><div><p><b>Tilting</b> <b>Fig 2</b></p></div></div> <p>Note.</p> <p>Really, an electrical signal processing be made 5° ~ 9° tilting degree even under the Maximum Tilting 12°</p>			
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	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3

TITLE		PRODUCT SPECIFICATIONS	
MODEL No.		TACT SWITCHES (MT 1500S TYPE)	PAGE 3/4
	Items	Test conditions	Criteria
6.3.4	Temperature cycling	<p>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.</p> 	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
6-4. Endurance			
6.4.1	Operating life	<p>Measurements shall be made by following the test set.</p> <p>(1)DC 5V 5mA resistive load.            (2)Rate of operation : 2 to 3 operations per second.            (3)Depression : 350gf Max            (4)Cycle of operation : 250,000 cycles (each direction 50,000 cycles)</p>	Contact resistance :1000m Max. Insulation resistance :10m 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	<p>Measurements shall be made by following the test set.</p> <p>(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.</p>	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
6.4.3	Impact shock Resistance	<p>Measurements shall be made by following the test set.</p> <p>(1)Acceleration : 80G            (2)Cycles of test : 3 cycles each in 6 directions, for a total of 18 cycles.</p>	Item 6-1 Item 6-2-1 Item 6-2-2 Item 6-2-3
7.Materials 1) HOUSING (BASE) : LCP 2) COVER : SUS 3) ACTUATOR 1 (STEM 1) : LCP 4) ACTUATOR 2 (STEM 2) : LCP 5) CONTACT : SUS WITH SILVER-PLATING			

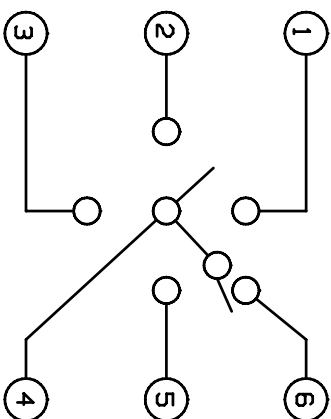
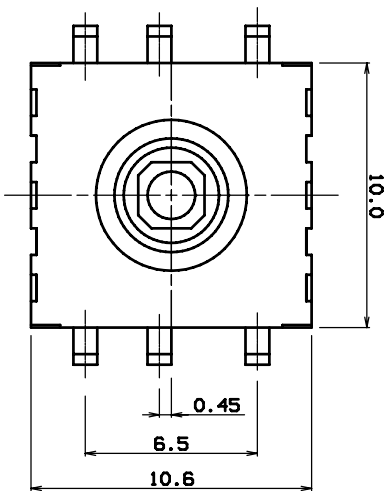
	<b>SPECIFICATIONS</b>	
	<b>TACT SWITCHES (MT 1500S TYPE)</b>	PAGE 4/4

4/4

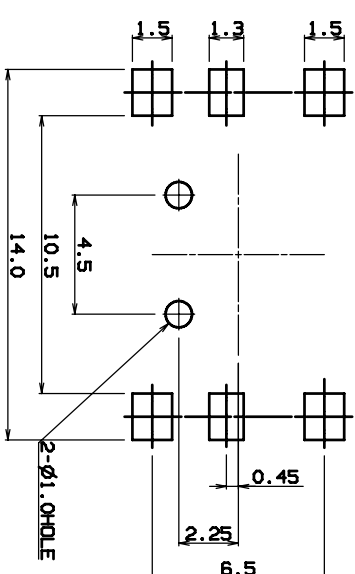
## Temperature Profile

[illegible]

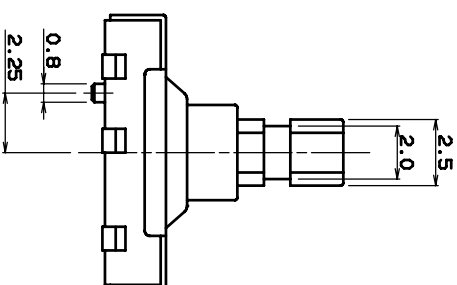
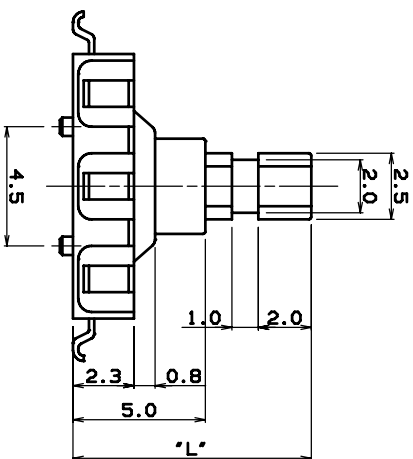
TITLE	<b>PRODUCT SPECIFICATIONS</b>	
MODEL No.	<b>TACT SWITCH</b>	PAGE 1/1
Caution		
<ol style="list-style-type: none"> <li>When terminals are exposed to mechanical stress during soldering, it may cause degradation in deformation and electrical property.</li> <li>Through-hole PC board, or a PC board thickness other than the recommendation may cause larger heat stress. Prior verification is highly recommended.</li> <li>In prior to the 2nd soldering switch shall be stable with normal temperature. It may cause deformation of switch, loose terminals, terminal removed from PCB, and / or degradation of electric property.</li> <li>Verify samples with actual mass production conditions.</li> <li>The products are designed and manufactured for direct current resistance. Individual consultation is recommended for use of other resistances such as inductive (L) or capacitive (C) .</li> <li>The sizes of holes and patterns on a PC board for mounting a switch, be as per the recommended dimensions in the product drawings.</li> <li>This switch is designed for manually operated units. Must not use this switch for a mechanical detection unit. For detection purposes, please use our detection switch.</li> <li>The switch will be break if impact force or a greater stress than that specified is applied. Take great care not to let the switch be subject to greater stress than specified.</li> <li>Do not apply a force from the side of the stem</li> <li>Be sure to push the center of switch for "without-stem" type. Extreme care is required for a hinge structure type. as the activation point may shift when it is pressed down.</li> <li>The circuit setting (software setting) shall be ensured for error-free operations, caused by bounce and chattering as specified by each model of the switches.</li> <li>Prior verification is needed to ensure that no corrosive gas-generating components are used near our switch. It may give negative influence such as contact failure.</li> <li>Contact resistance of a carbon contact type may very depending on push force. Confirm that it functions sufficiently in using TACT switch with a voltage divider circuit.</li> <li>Be aware of dust intrusion into a non dust-proof TACT switch.</li> <li>Storage <ul style="list-style-type: none"> <li>Storage the products as delivered, at a normal temperature and humidity, without direct sunshine and corrosive gas ambient. Use them at an earliest possible timing, not later than six months upon receipt.</li> <li>After breaking the seal, keep the products in a plastic bag to prevent out ambient air, store them in the same environment as above, and use all as soon as possible.</li> <li>Do not stack too many switches.</li> <li>Store the key switches in released position.</li> </ul> </li> <li>All specification can be changed to improve performance without any notice.</li> </ol>		



CIRCUIT DIAGRAM



CIRCUIT DIAGRAM



NOTE

1. OPERATING FORCE : 4-DIRECTION 250 ±30 , CENTER : 500 ±70
2. LIFE CYCLE : FDE EACH 50,000 CYCLE
3. RATING : MAX 50mA , 12V DC
4. STROKE (mm) : 4-DIRECTION 0.4 ±0.1 , CENTER : 0.2±0.1
5. CONTACT RESISTANCE : 100mΩ MAX
6. FEATURE : MULTI THIN TYPE, REFLOW SOLDERING

STEM SHAPE	A	B	C
"L"	5mm	7mm	9mm

No.	PART NAME	Q'TY	MATERIAL	UNIT	SCALE	MODEL	TREAT.	REMARKS
1				m/m	1	MT 1500S TYPE		
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								