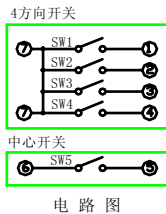
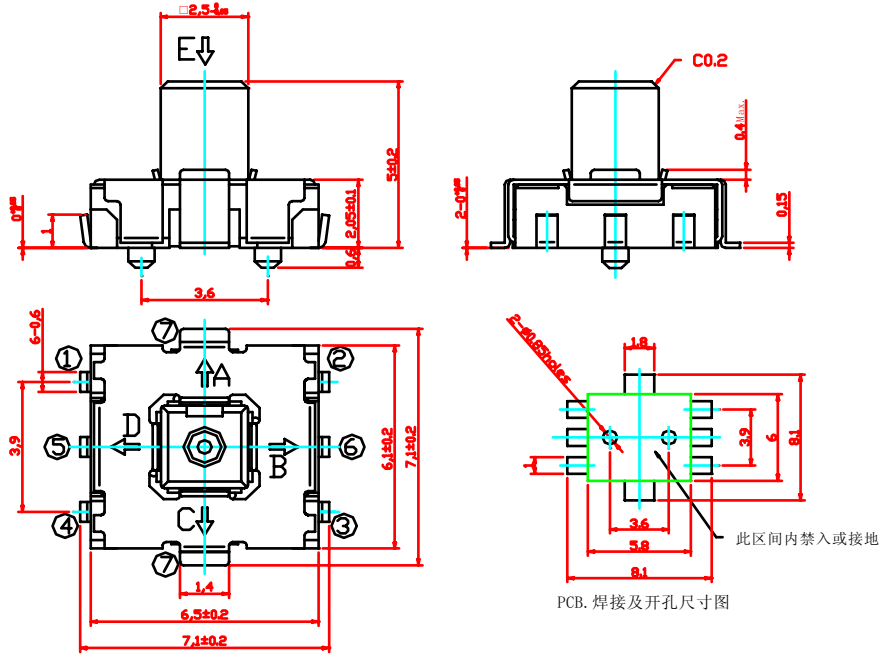


THMU12



端子功能表

操作方向	①	②	③	④	⑤	⑥	⑦
A	●	●	●	●	●	●	●
B	●	●	●	●	●	●	●
C	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●

借(通)用件登记

描图

描校

旧底图总号

底图总号

签字

标记 处数 更改文件号 签字 日期

日期

设计 盛有才 标准化 周成良
日期 05.11.10 日期 05.11.10
校对 吴公元 审核 赵高杰
日期 05.11.10 日期 05.11.10



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图样标记 重量 比例

共 页 第 页

THMU12



TACT SWITCH SPECIFICATION
(轻触开关规格书)

LANGUAGE

English /Chinese

1.General specification 基本说明

1.1 Scope 范围 This specification covers the requirements for single key switches which have no keytop (TACT SWITCHES:MECHANICAL CONTACT).此规范含盖单推柄和无推柄的轻触开关要求

1.2 Operating Temperature Range 使用温度范围
-20 to70°C(normal humidity, normal press.) 正常湿度, 标准压力

1.3 Storage Temperature Range 保存温度范围
-30 to80°C(normal humidity, normal press.)

1.4 Test Conditions 测试条件
Tests and measurements shall be made in the following standard cnditions unless otherwise specified: 测试和计量按下列标准条件除非特殊说明

Normal temperature (temperature 5 to 35°C) 标准温度

Normal humidity (relative humidity 45 to85%) 正常湿气

Normal pressure (pressure 860 to 1060 mbars) 标准压力

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

Temperature (20±2°C) 温度

Relative humidity (65±5%) 相对湿度

Pressure (860 to 1060 mbars) 压力

2.APPEARANCE, STYLE, AND DIMENSIONS 外形,类型和尺寸

2.1 Appearance 外形

There shall be no defects that affect the serviceability of the product.外形必须无缺陷才不影响产品适用性

2.2 Style and Dimensions 类型和尺寸

Shall conform to the assembly drawings.符合装配图

3.TYPE OF ACTUATION 动作类型

Tactile feedback 轻触返回

4.CONTACT ARRANGEMENT 1 poles 1 throws 1 poles 4 throws 接触形式

1 接点 1 回路 1 接点 4 回路

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

细接点形式在装配图中

5.MAXIMUM RATINGS DC 15 V 20 mA 最大额定值

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TACT SWITCH SPECIFICATION

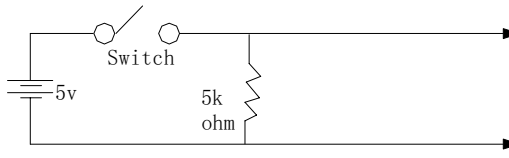
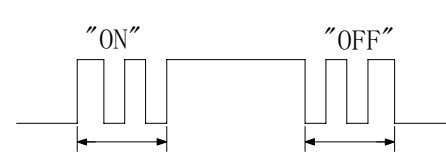
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LANGUAGE

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6.PERFORMANCE 性能

6.1 Electrical 电气

Item 项目	Test Condition 测试条件	Requirements 要求
6.1.1. Contact Resistance 接触电阻	Applying astatic load twice the actuating force to the center of the stem,measurements shall be made with a 1 kHz small-current contact resistance meter. 用两倍的动作用力作静负载施加于按钮的中心,并用 1 千赫小电流接触电阻仪测量	<u>200</u> m ohm max.
6.1.2. Insulation Resistance 绝缘电阻	Measurements shall be made following application of DC100V potintial across terminals and across terminals and frame for one minute.在端子与端子之间,端子与外壳之间施加 DC100V,一分钟	<u>50</u> M ohm min.
6.1.3. Dielectric witstanding voltage 电气耐压	AC250V(50Hz or60Hz) shall be applied across terminals and across terminals and frame for one minute. 在端子与端子之间,端子与外壳之间施加 AC250V(50HZ-60HZ)	There shall be no breakdown. 没有击穿
6.1.4. Bounce 抖动	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". 在正常使用中(以每秒 3-4 次周期)轻轻地在手柄中心加力, 在通与断瞬间测试抖动  	<u>10</u> m sec max.

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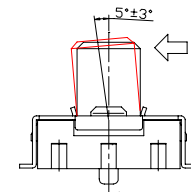
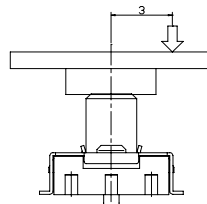
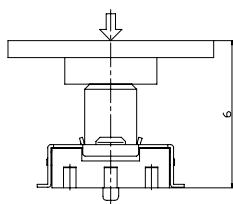
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LANGUAGE

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6.2 Mechanical 机械特性

Item 项目	Test Condition 试验条件	Requirements 规格
6.2.1. Actuating Force 动作力	Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center or four directions of the stem, the maximum load required for the stem to come to a stop shall be measured. 开关的动作方向为垂直放置开关向推柄中心或四方向逐渐地增加负荷直到推柄停止时所测量的最大负荷	Push on: 220 ± 80 gf Tilting: 140 ± 50 gf
6.2.2. Travel 行程	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 or four directions of the stem, the travel distance for the stem to come to a stop shall be measured. 开关的动作方向为垂直放置开关,并以双倍动作力的静负荷作用推柄中心或四方向,测量推柄从开始到停止的行程距离	Push on: 0.20 ± 0.10 mm Tilting: $5^\circ \pm 2^\circ$
6.2.3. Return Force 返回力	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. 开关的动作方向为垂直放置开关,在已有行程的推柄中心向上减小压力,推柄回到自由位置时所测量到的力	Push on: 50 gf Min
6.2.4. Stop Strength 静止强度	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. 开关的动作方向为垂直放置开关,在推柄动作方向施加 3 KG 的静负荷, 60 秒时间	There shall be no sign of damage mechanically and electrically. 无机械的和电气的损伤迹象
6.2.5. Stem Strength 推柄的强度	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. 开关的动作方向为垂直放置开关,从推柄动作方向反方向施加拉力所测量到的最大承受力	3 kgf



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TACT SWITCH SPECIFICATION
(轻触开关规格书)

LANGUAGE

English /Chinese

6.3 Environmental 环境

Item 项目	Test Condition 测试条件	Requirements 要求
6.3.1. Resistance to Low Temperatures 耐低温	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: 样品按下列条件进行耐低温试验,测试前在正常温度和湿度条件下放置 1 小时 (1) Temperature: $-30 \pm 2^{\circ}\text{C}$ 温 度 (2) Time: 96 hours 时 间 (3) Water drops shall be removed. 擦除水珠	Item 6.1 Item 6. 2.1 Item 6.2.2
6.3.2. Heat Resistance 耐热	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: 样品按下列条件进行耐热试验,测试前在正常温度和湿度条件下放置 1 小时 (1)Temperature: $80 \pm 2^{\circ}\text{C}$ 温 度 (2) Time: 96 hours 时 间	Item 6.1 Item 6. 2.1 Item 6.2.2
6.3.3. Moisture Resistance 耐潮湿	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: 样品按下列条件进行耐潮湿试验,测试前在正常温度和湿度条件下放置 1 小时 (1) Temperature: $60 \pm 2^{\circ}\text{C}$ 温 度 (2) Relative humidity: 90 to 95% 相对湿度 (3) Time: 96 hours 时 间 (4) Water drops shall be removed. 擦除水珠	Contact resistance: <u>500</u> m ohm max 接触电阻 Insulation resistance <u>10</u> M ohm min. 绝缘电阻 Item 6.1.3 Item 6.2.1 Item 6.2.2
6.3.4. Temperature Cycling 温度循环	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made. 样品按下列条件进行温度循环试验,测试前在正常温度和湿度条件下放置 1 小时 During this test, water drops shall be removed. 在试验期间,擦除水珠 <div style="text-align: center;"> </div>	Item 6.1 Item 6. 2.1 Item 6.2.2

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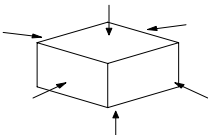
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6.4 Endurance 耐久性

Item 项目	Test Condition 测试条件	Requirements 要求
6.4.1. Operating Life 动作寿命	Measurements shall be made following the test set forth below: 按下列条件进行寿命试验 (1)DC 5V 5mA resistive load. DC 5V 5mA 阻性负载 (2)Rate of operation:2 to 3 operations per second 动作频率:2-3 次/每秒 (3)Depression: <u>300</u> gf 减压力 (4)Cycles of operation: 5×10^4 cycles 动作次数: 5×10^4 次	Contact resistance: <u>300m</u> Ω max. 接触电阻 Insulation resistance : <u>10</u> M ohm min. 绝缘电阻 Actuating force: 动作力 + <u>30</u> % or - <u>30</u> % of initial force. $\pm 30\%$ 初始动作力 Item 6.1.3 tem 6. 2.2
6.4.2. Vibration Resistance 耐振动	Measurements shall be made following the test set forth below: 按下列条件进行抗振动试验 (1)Range of oscillation:10 to 55Hz 频率范围 (2)Amplitude,pk-to-pk:1.5 mm 振幅: 峰-峰 1.5mm (3)Cycle of sweep: 10-55-10Hz in one minute,approx. 扫描周期: 10-55-10Hz 约一分钟内 (4)Mode of sweep :Logarithmically sweep or uniform sweep. 扫描方式:对数扫描式恒定扫描 (5) Direction of oscillation: 振动方向 Three mutually perpendicular directions,including the direction of stem travel. 3 个相互垂直方向,包括推柄行程方向 (6) Duration of testing: 持续时间 2 hours each ,for a total of 6hours.每方向 2 小时,共 6 小时	Item 6.1 Item 6.2.1 Item 6.2.2
6.4.3. Impact Shock Resistance 抗冲击	Measurements shall be made following the test set forth below: 按下列条件进行冲击试验 (1)Acceleration:80g 加速度 (2)Cycles of test :3 cycles each in 6directions, for a total of 18cycles 试验次数:每个方向 3 次,6 个方向共 18 次 <div style="text-align: center;">  </div>	Item 6.1 Item 6.2.1 Item 6.2.2

						APPD	CHKD	DSGD	PART NO:	
									DOCUMENT NO:SPECTSZ.DOC	5/10
ZONE	SYMB	DATE	APPD	CHKD	DSGD					



TACT SWITCH SPECIFICATION

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LANGUAGE

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7. Environmental Endurance 环境耐久性

Item 项目	Test Condition 测试条件	Requirements 要求
7.1. High Temperature Cycling 高温循环	<p>Following ten cycles of high temperature test. Sample shall be placed in normal temperature and humidity conditions for one hour before measurements are made. During this test, water drops shall be removed.</p> <p>样品按下列条件进行高低温循环试验,测试前在正常温度和湿度条件下放置 1 小时,除去水珠</p> <p>(1) Temperature(温度): 20° ~80°C</p> <p>(2) Cycling(周期): Ten cycles (10 个周期)</p> <div data-bbox="422 840 790 1041" data-label="Figure"> <p>The diagram shows a temperature profile for one cycle. It starts at 20°C for 20 minutes, then ramps up to 80°C over 10 minutes, stays at 80°C for 20 minutes, and finally ramps down to 20°C over 10 minutes.</p> </div>	Item 6.1 Item 6. 2.1 Item 6.2.2
7.2 Moisture Resistance 耐潮湿	<p>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: 样品按下列条件进行耐潮湿试验,测试前在正常温度和湿度条件下放置 1 小时</p> <p>(1) Temperature: 85±2°C 温度</p> <p>(2) Relative humidity: 80 to 85% 相对湿度</p> <p>(3) Time: 500 hours 时间</p> <p>(3) Water drops shall be removed. 擦除水珠</p>	Contact resistance: <u>50</u> m ohm max 接触电阻 Insulation resistance <u>10</u> M ohm min. 绝缘电阻 Item 6.1.3 Item 6.2.1 Item 6.2.2

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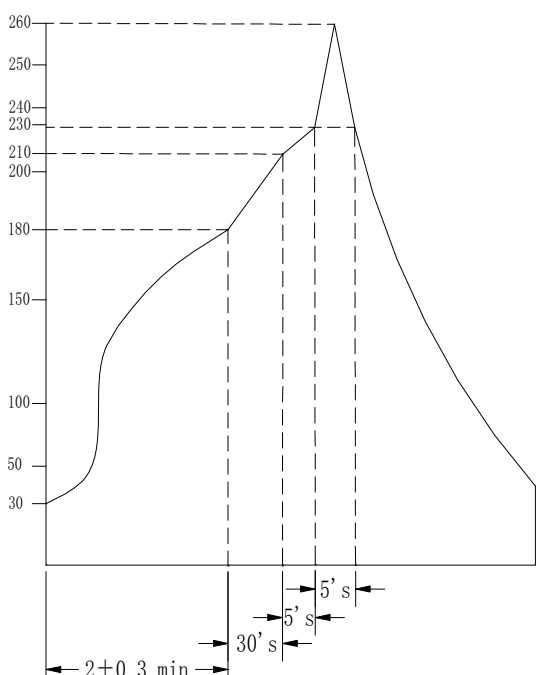


TACT SWITCH SPECIFICATION
(轻触开关规格书)

LANGUAGE

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8.Use Endurance 使用耐久性

Item 项目	Test Condition 测试条件	Requirements 要求
8.1 Solderability 焊接性	Oven Temperature: $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$, Time: $5\text{S} \pm 1\text{S}$ 锡炉温度: $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 时间: 5 秒 \pm 1 秒	Tin Area: 90% 焊接面积 90% 以上
8.2 patience high temperature 焊接耐热性	<p>Preheat: Temperature on the copper foil surface should reach 180°C, 2 ± 0.3 minutes after The P.W.B entered into the soldering equipment 预热: 在 P.W.B(印刷线路板)进入焊接设备后, 2 ± 0.3 分钟内铜箔表面要达到 180°C</p> <p>Soldering heat: Temperature on the copper foil surface should reach the peak temperature of 260°C within 5 seconds after the P.B.W entered into soldering heat zone. 焊接温度: 在 P.W.B(印刷线路板)进入焊接温区 5 秒内, 铜箔表面达到峰值温度 260°C</p> 	表面无起泡, 变型 Surface of plastics don't frothed And formed

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									DOCUMENT NO: SPECTSZ.DOC	7/10
ZONE	SYMB	DATE	APPD	CHKD	DSGD					



TACT SWITCH SPECIFICATION

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9. Other precautions 其他注意事项

- (1) Following the soldering process, do not try to clean the switch with a solvent or the like.
进行焊接过程中，不可以用溶剂或类似品清洗开关
- (2) Safeguard the switch assembly against flux penetration from its topside.
防止助焊剂从开关的顶端渗入
- (3) Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods at most.
交货后保证开关处于封密状态并库存时间 90 天以上

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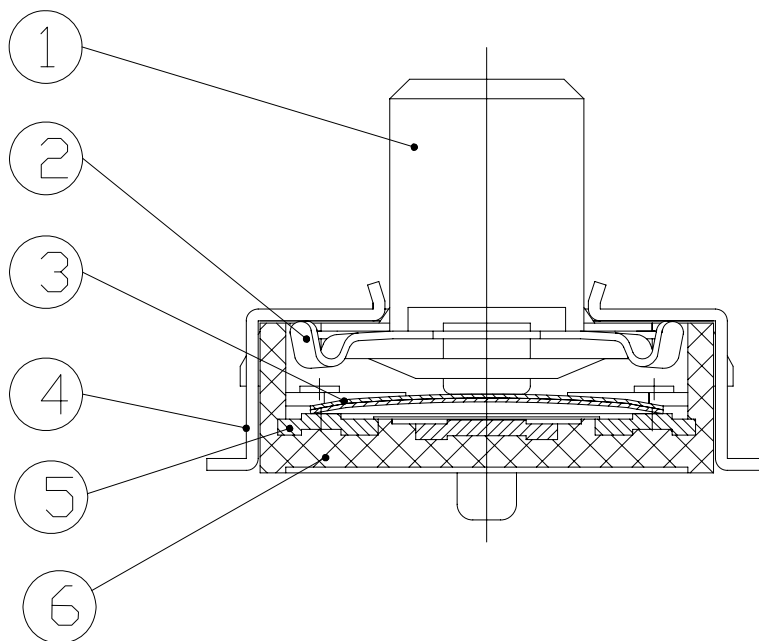


TACT SWITCH SPECIFICATION

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ITEM 项目	COMPONENTS 部件	MATERIAL ARTICLE 材料	SPECIFICATION 规格
1	STEM	LCP	E130I
2	CONTACT 1	TIN PHOSPHORUS BRONZE	Qsn6.5-01
3	CONTACT 2	CUPRUN STRIP SILVER	Ag=0.5u
4	HOUSING	TIN PHOSPHORUS BRONZE	Qsn6.5-01
5	TERMINAL	TIN PHOSPHORUS BRONZE	Qsn6.5-01
	PLATE LAYER (电镀层)	CYANIDE SILVER-PLATING	SILVER
6	FRAME	LCP	E130I

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