

Edition 版本: A

## SPECIFICATION

### 规格书

Model : Tacting Switch TSA-R Type

型号: TSA-R 轻触开关

Yueqing Nanguang Electronics Co., Ltd.

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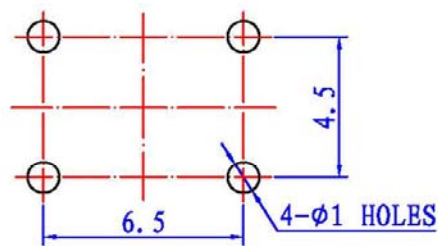
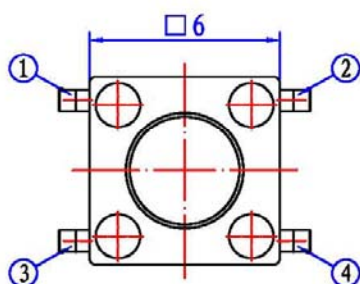
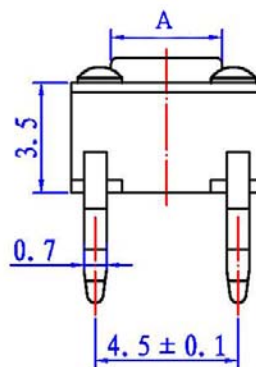
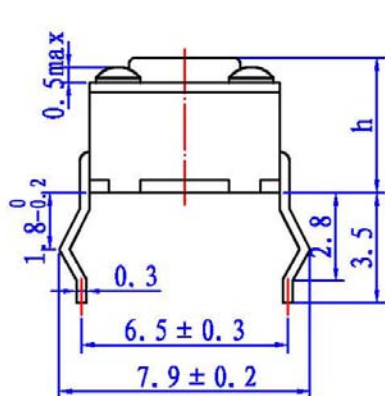


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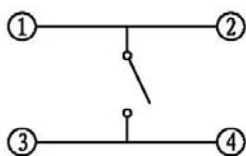
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P.C.B. mounting  
hole dimension



Circuit diagram

Model X	DIM-h	DIM-A
A	4.3	Φ3.5
B	5.0	Φ3.5
C	7.0	Φ3.3
D	9.5	Φ3.1
E	13.0	Φ3.0
F	17.0	Φ3.0
I	8.5	Φ3.3
T	5.6	Φ3.5
7.8	7.8	Φ3.2
9	9.0	Φ3.2
11	11.0	Φ3.0

Model 型号	Height 高度	Stem color 推柄颜色	Actuating force (gf) 动作力	Return force (gf) 回复力	Remark 备注
TSAX-1RL	According the pictures show h  按照图中的 h 所示	Black	100±50	10 Min	RoHS
TSAX-2RL		Brown	160±50	50 Min	
TSAX-3RL		Red	260±70		
TSAX-21RL		Black	160±50		
TSAX-31RL		Black	260±70		
TSAX-32RL		Brown	260±70		

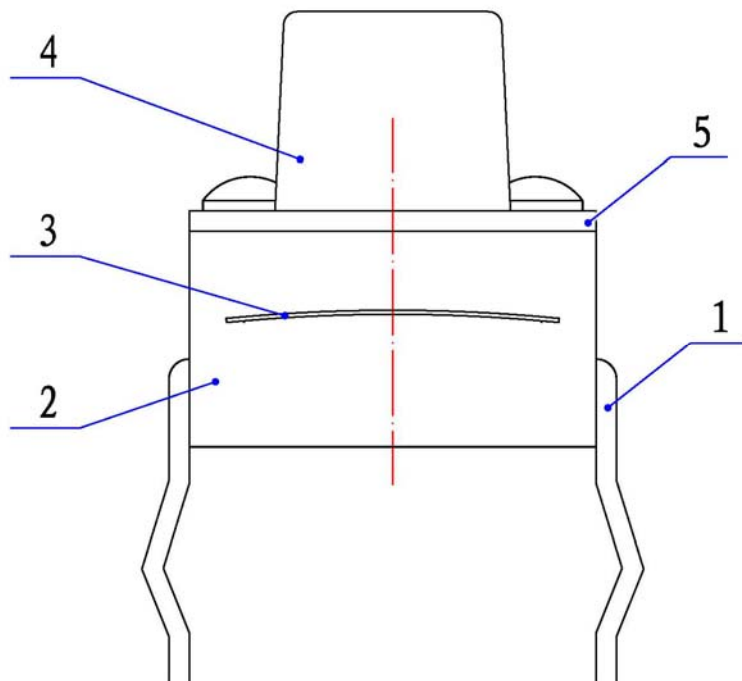


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Item 项目	Components 零件部分	Material article 材料
1	Terminal 端子	Brass strip silver clothed 黄铜镀银
2	Housing 本体	PA66
3	Dome 簧片	Silver phosphor bronze strip 覆银磷青铜
4	Stem 推柄	PA66
5	Cover 盖板	PET 聚脂薄膜



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#### 1 General specification 基本事项

##### 1.1 Switch action 开关种类:

Push-on type S.P.S.T

##### 1.2 Maximum ratings 最大额定值:

DC 12V 50mA

##### 1.3 Operation temperature range 使用温度范围:

-25~70℃ (normal humidity, normal press 常温, 常压)

##### 1.4 Storage temperature range 保存温度范围:

-30~80℃ (normal humidity, normal press 常温, 常压)

##### 1.5 Standard condition 试验、测定状态:

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

无特殊要求, 测试与测量均须在以下标准条件中进行:

Ambient temperature 温度: 5~35℃

Relative humidity 相对湿度: 45~85%

Air pressure 气压: 86~106kPa (860~1060mbar)

However, if doubt arises on the decision based on the measured values under the above-mentioned conditions, the following conditions shall be employed:

但是在对判定产生疑义时, 按下述状态试验:

Ambient temperature 温度: 20±2℃

Relative humidity 相对湿度: 65±5%

Air pressure 气压: 86~106kPa (860~1060mbar)

#### 2 Appearance, style, and dimensions 外观、类型及尺寸

##### 2.1 Appearance 外观:

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

无影响产品使用性能的不良现象存在。

##### 2.2 Style and dimensions 类型和尺寸:

Shall conform to the assembly drawing.

必须符合图纸内容。



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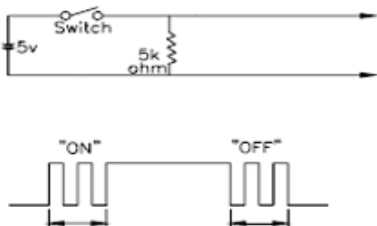
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#### 3 Performance 性能

##### 3.1 Electrical characteristics 电气性能

No 序号	Item 项目	Test condition 测试条件	Requirements 要求
3.1.1	Contact resistance 接触电阻	Push force:(Operation force) $\times$ 2 测定时的负荷: 操作方向动作力基准值的 2 倍。 Measurement tool: Contact resistance meter 测定工具: 接触电阻测试仪(1kHz, 20mV, 5~50mA)	50m $\Omega$ MAX 最大为50毫欧姆
3.1.2	Insulation resistance 绝缘电阻	D.C.250V for 1 min(Between terminals) (端子间)	100 M $\Omega$ MIN 最小为100兆欧姆
3.1.3	Dielectric withstand voltage 绝缘电压	A.C.250V for 1 min(Between terminals) (端子间)	There shall be no breakdown 无损坏
3.1.4	Bouncing 触电抖动	Operation speed:3~4 times/s 操作速度: 每秒3~4次 	5ms MAX 最大为5毫秒



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#### 3.2 Mechanical 机械性能

No 序号	Item 项目	Test condition 测试条件	Requirements 要求
3.2.1	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 of the stem, the maximum load required for the stem to come to a stop shall be measured. 按规定进行测量，测量时固定开关并使其操作方向垂直，然后向推柄中心部分逐渐加压力，测量开关动作结束时的最大负荷。	According to Page 1 Actuating Force(gf) 按照本规格书中第一页动作力所示
3.2.2	Contact closure travel 接通点行程	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 of the stem, the travel distance for the stem to come to a stop shall be measured. 按规定进行测量，测量时固定开关并使其操作方向垂直，然后向推柄中心部分逐渐加2倍动作力的压力，测量开关动作结束后最大的动作行程。	$0.25^{+0.2}_{-0.1}$ mm
3.2.3	Return force 回复力	The sample switch is installed such that the direction of switch operation is vertical and, upon depression of the stem in its center, the returning force of the stem after its full travel. 固定开关并使开关的操作方向垂直，按压推柄中心部分，将推柄按压至整个行程距离时释放产生的力。	According to Page 1 Return Force(gf) 按照本规格书中第一页回复力所示
3.2.4	Stop strength 闭锁强度	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 15 s. 固定开关，使开关与操作方向垂直，向推柄的操作方向加3Kgf的静负荷，时间为15秒	There shall be no sign of damage mechanically and electrically. 开关无机械损伤，并能正常动作
3.2.5	Terminal strength 端子强度	Fixation the switch, a static load of 1 Kgf shall be applied in any direction of terminal for a period of 15 s. 固定开关，向端子任意方向最多施加1Kgf的静负荷，维持15秒。	



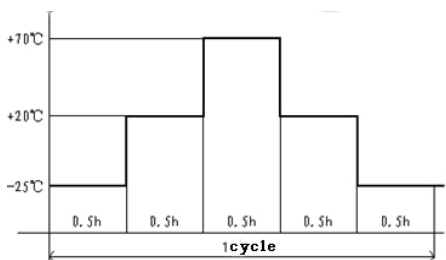
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#### 3.3 Climatic characteristics 耐候性能

No 序号	Item 项目	Test condition 测试条件	Requirements 要求
3.3.1	Resistance to low temperatures 耐寒性	1) Temperature: $-25\pm 3^{\circ}\text{C}$ 温度: $-25\pm 3^{\circ}\text{C}$ 2) Duration of test: 96h 持续时间: 96小时 3) Take off a drop water 去掉水珠 4) Standard conditions after test: 1h 试验后的放置条件: 1小时	No 序号 3.1 No 序号 3.2.1 No 序号 3.2.2
3.3.2	Heat resistance 耐热性	1) Temperature: $70\pm 2^{\circ}\text{C}$ 温度: $70\pm 2^{\circ}\text{C}$ 2) Duration of test: 96h 持续时间: 96小时 3) Standard conditions after test: 1h 试验后的放置条件: 1小时	No 序号 3.1 No 序号 3.2.1 No 序号 3.2.2
3.3.3	Temperature cycle 温度循环	1) Test cycles: 5 cycles 试验周期: 5个周期 2) Standard condition after test: 1h 试验后的放置条件: 1小时 	No 序号 3.1 No 序号 3.2.1 No 序号 3.2.2
3.3.4	Moisture resistance 耐湿性	1) Temperature: $40\pm 2^{\circ}\text{C}$ 温度: $40\pm 2^{\circ}\text{C}$ 2) Relative humidity: 90~95% 相对湿度: 90~95% 3) Duration of test: 96h 持续时间: 96小时 4) Take off a drop water 去掉水珠 4) Standard conditions after test: 1h 试验后的放置条件: 1小时	Insulation resistance 绝缘电阻: 10 MΩ MIN No 序号 3.1.1 No 序号 3.1.3 No 序号 3.2.1 No 序号 3.2.2





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#### 3.4 Endurance 耐久性

No 序号	Item 项目	Test condition 测试条件	Requirements 要求
3.4.1	Operating life 动作寿命	1) D.C.12V 50mA resistance load 直流负载: D.C 12V 50mA 2) Operation speed:2~3 times/s 动作速度: 2~3次/秒 3) Depression: Twice the actuating force 按力: 两倍动作力 4) Cycles of operation: $10 \times 10^4$ times 动作次数: $10 \times 10^4$ 次	No 序号 3.1.1 No 序号 3.1.2 No 序号 3.1.3 No 序号 3.2.1 No 序号 3.2.2
3.4.2	Vibration resistance 耐振动	1) Range of oscillation 振动频率: 10~55 Hz 2) Amplitude 振幅: pk-to-pk:1.5 mm 3) Cycle of sweep: 10-55-10 Hz in one minute,approx 振动频率: 大约1分钟之内10-55-10 Hz 4) Mode of sweep: logarithmically sweep or uniform sweep 振动模式: 等幅振动或一致性振动 5) Direction of oscillation: Three mutually perpendicular directions, including the direction of stem travel 振动方向: 三个互相垂直的方向, 包括推柄移动的距离 6) Duration of testing: 2 hours each, for a total of 6 hours 试验时间: 2小时为一个周期, 共计6小时	No 序号 3.1 No 序号 3.2.1 No 序号 3.2.2
3.4.3	Impact shock 耐冲击	1) Acceleration 加速度: 80G 2) Cycles of test:3 cycles each in 6 directions, for a total of 18 cycles: 测试周期: 每6个方向循环3次, 共计18个循环	No 序号 3.1 No 序号 3.2.1 No 序号 3.2.2



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#### 4 Switch handling precautions 开关使用预防措施

##### 4.1 Soldering condition 浸焊条件

No 序号	Item 项目	Soldering condition 耐焊接热条件
4.1.1	Preheat temperature 预热温度	110~120℃ (Ambient temperature of printed circuit board on its soldering side) 耐焊接热印刷电路板的周边温度
4.1.2	Preheat time 预热时间	80~120s
4.1.3	Flux foaming 助焊剂泡沫	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. 在固定的范围内将助焊剂以流体状置于印刷电路板表面，固定各组装部分。预备的助焊剂不能放在表面已装有各组件及端子的印刷电路板附近。
4.1.4	Soldering temperature 耐焊接热温度	255℃ MAX
4.1.5	Duration of solder immersion 焊接持续时间	5s MAX
4.1.6	Allowable frequency of soldering process 耐焊接热次数	1 time

##### 4.2 Other precautions 其他预防

- Following the soldering process, do not try to clean the switch with a solvent or the like.  
依照耐焊接热的程序操作，不得使用溶剂或类似东西清洗开关。
- Safeguard the switch assembly against flux penetration from its topside.  
保护开关并防止助焊剂从开关顶部渗入。
- Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods.  
请把产品置于密封处，出货后库储有效期90天。



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#### 5 Packaging 包装

##### 5.1 Pcakaging Materials 包装材料

Item 项目	Substance 材质
Carton Box 硬纸箱	Corrugated paper 瓦楞纸
Packing Carton 包装纸箱	Corrugated paper 瓦楞纸
Plastic Bag 塑胶袋	Normal Plastic 塑料

##### 5.2 Packaging Unit 包装单位

The capacity of packing carton 包装箱的容量:

Every carton box contains 4 packing carton at most 每一个硬纸箱最多包含4包装纸箱

Every packing carton contains 10K PCS goods at most 每一个包装纸箱最多包10KPCS货物

Every plastic bag contains 2000 PCS goods 每一个包装袋最多包含2000PCS货物

##### 5.3 The dimension of Plastic bag 包装袋的尺寸: 24×20 cm

##### 5.4 The dimension of Packing carton 包装纸箱的尺寸: 25×18×16 cm

##### 5.5 The dimension of Carton box 硬纸箱的尺寸: 52×39×19 cm