



# 目 录

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深圳市兴联合电子有限公司  
Shenzhen Xinglian Electronics Co., Ltd



DESCRIPTION:  
(规格书)  
**SPECIFICATION**

Model:  
4X4 铜钮方盖四脚立贴

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## SPECIFICATION FOR APPROVAL

## 一、GENERALITY（概述）

## 1. Description（产品说明）

Touch switch is an electronic switch mainly used in various electronic devices, such as mobile phones, tablets, digital cameras, etc. This product adopts light touch technology and features simple, convenient, and fast operation.

轻触开关是一种电子开关，主要用于各种电子设备中，如手机、平板电脑、数码相机等。该产品采用轻触技术，具有操作简单、方便、快速等特点。

## 2. Product Features（产品特点）

(1)	<b>Lightly touch the button, comfortable to touch and easy to operate.</b> 轻触按键，手感舒适，操作方便。
(2)	<b>Suitable for various electronic devices such as mobile phones, tablets, digital cameras, etc.</b> 适用于各种电子设备，如手机、平板电脑、数码相机等。
(3)	<b>It has the characteristics of high sensitivity, fast response, and low noise.</b> 具有高灵敏度，快速响应，低噪音等特点。
(4)	<b>It can achieve single or multi-point control and is suitable for various application scenarios.</b> 可实现单点或多点控制，适用于各种不同的应用场景。
(5)	<b>The exterior design is simple and elegant, in line with modern aesthetic concepts.</b> 外观设计简洁大方，符合现代审美观念。

## SPECIFICATION FOR APPROVAL

## 二、STANDARDS AND SPECIFICATIONS（引用标准及规范）

The following documents form a part of this specification. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

以下参考文件是本规格书的一个组成部份。若本规格书中的要求与产品图纸发生冲突，则产品图中的要求为优先；若本规格书中的要求与参考文件中的要求冲突，则本规格书为优先。

GB/T 2421	<b>Testing method for Environmental of Electrical Connectors</b> 电工电子产品环境试验
GB/T 2423	<b>Testing method for Environmental of Electrical Connectors</b> 电工电子产品环境试验
GB 2424	<b>Testing method for Environmental of Electrical Connectors</b> 电工电子产品基本环境试验规程
GB/T 5095	<b>Testing procedure/method for components of electric equipment</b> 电子设备用机电元件基本试验规程及测量方法

SPECIFICATION FOR APPROVAL

### 三、PERFORMANCE TEST (产品性能测试)

#### 1. Basic Description (基本说明)

##### 1.1 Scope (范围)

**This specification covers the requirements for single key switches which have no key top**  
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)

**-40 to+85°C normal humidity, normal press.** (正常湿度, 标准压力)

##### 1.3 Storage Temperature Range (保存温度范围)

**-40 to+85°C normal humidity, normal press.** (正常湿度, 标准压力)

##### 1.4 Test Conditions (测试条件)

**Tests and measurements shall be made in the following standard conditions 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 to 85%)** (正常湿气)

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

**In case any question arises from the judgment 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)

##### 1.5 Type of actuation: Tactile feedback (动作类型: 轻触返回)

##### 1.6 Contact arrangement 1 poles1 throws (接触形式 1 接点 1 回路)

#### 2.Appearance and Dimension (外观及尺寸)

**2.1 Appearance:Product surface without defect、dirt、crack、and mechanical damang,Contact without rust,plating not oxidized and not peeled.**

产品表面不应有对制品有害的缺陷、污垢、裂痕及机械损伤; 接触件无锈蚀、镀层氧化、脱落等现象。

##### 2.2 Dimension:According to drawings

外形尺寸: 依照附图

##### 2.3 Exchangable:Exchangable with same specification products.

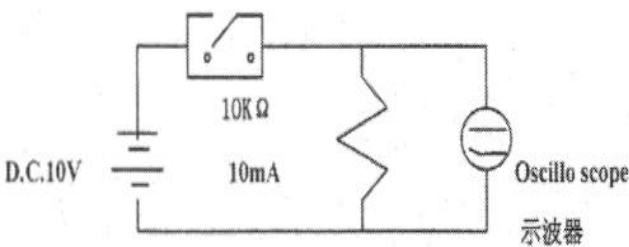
互换性: 相同规格应能互换.

#### 3. RATING (定额值)

<b>MAXIMUM RATINGS</b> 最大额定值	DC <u>  12  </u> V <u>  50  </u> mA
<b>Minimum rated value</b> 最小额定值	DC <u>  1  </u> V <u>  10  </u> μ A

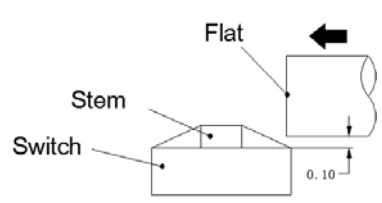
## SPECIFICATION FOR APPROVAL

**6. General specification (性能)**
**6.1 Electrical performance (电气的性能)**

Item 项目		Test Condition 测试条件	Requirements 要求
6.1.1	<b>Contact Resistance</b> 接触电阻	<b>Applying 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.</b> (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)	$\leq 100\text{m}\Omega\text{max}$
6.1.2	<b>Insulation Resistance</b> 绝缘电阻	<b>Measurements shall be made following application of DC100V potential between terminals and between individual terminals and frame for one minute.</b> (在端子与端子之间,端子与外壳之间施加 DC100V,一分钟)	$\geq 100\text{M}\Omega\text{min}$
6.1.3	<b>Dielectric withstanding voltage</b> 电气耐压	<b>AC 250 V (50Hz or 60Hz) shall be applied between terminals and between individual terminals and frame for one minute.</b> (在端子与端子之间,端子与外壳之间施加 AC250V(50HZ-60HZ),一分钟)	<b>There shall be no breakdown.</b> 无击穿、闪烁现象
6.1.4	<b>Bounce</b> 抖动	<p><b>Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec),</b></p> <p><b>Bounce shall be tested when "ON" and "OFF".</b> 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</p>  <p style="text-align: center;"><u>Switch Bouncing Test Circuit</u> 抖动测定回路</p>	<p>ON 10ms max</p> <p>OFF 10ms max</p>

## SPECIFICATION FOR APPROVAL

## 6.2 Mechanical performance (机械的性能)

Item 项目		Test Condition 测试条件	Requirements 要求
6.2.1	Actuating Force 动作力	Place the switch such that the direction of switch operation is vertical and then gradually increase the load applied to the center 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逐渐地增加负荷直到推柄停止时所测量的最大负荷)	Reference image 参考图面
6.2.2	Travel 行程	Place the switch such that the direction of switch operation is vertical and then apply 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. (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,测量推柄从开始到停止的行程距离)	Reference image 参考图面
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)	<u>45</u> gf min
6.2.4	Push Strength 正推强度	Placing the switch such that the direction of switch operation is vertical, a static load of <u>50</u> N shall be applied in the direction of stem operation for a period of <u>15</u> seconds. (开关的动作方向为垂直放置开关,在推柄动作方向施加 50N 的静负荷,15 秒时间)	There shall be no sign of damage mechanically and electrically. 无机械的和电气损伤象
6.2.5	Side Push Strength 侧推强度	3N 15 sec Initial product with 2 times reflow  	There shall be no sign of damage mechanically and electrically. 无机械的和电气损伤迹象

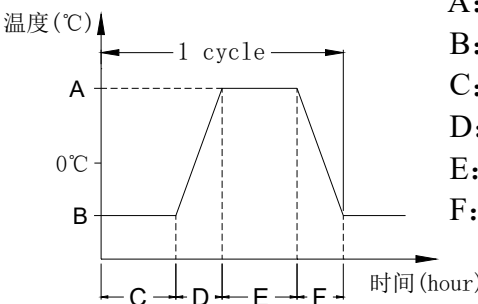
## SPECIFICATION FOR APPROVAL

## 6.3 Durability (使用耐久性能) 表一

Item 项目		Test Condition 测试条件	Requirements 要求
6.3.1	<b>Operating Life</b> 动作寿命	<b>Measurements shall be made following the test set forth below:</b> 按下列条件进行寿命试验 (1) DC 15V 20mA resistive load. DC 15V 20mA 阻性负载 (2) Rate of operation: 1 to 2 operations per second 动作频率: 1-2 次/每秒 (3) Depression: <u>+50</u> gf 减压力 (4) Cycles of operation: Reference image cycles 动作次数: 参考图面	Contact resistance: <u>200</u> mΩ Max. 接触电阻 Insulation resistance: <u>50</u> MΩ Min. 绝缘电阻 Actuating force: 动作力 + <u>30</u> % or - <u>30</u> % of initial force. ±30% 初始动作力 Item 6.1.3 Item 6.2.2
6.3.2	<b>Moisture Resistance</b> 耐潮湿	<b>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made:</b> 样品按下列条件进行耐潮湿试验, 试验后在正常温度和湿度条件下放置 1 小时后测定 (1) Temperature: $60 \pm 2^{\circ}\text{C}$ 温度 (2) Relative humidity: 90 to 95% 相对湿度 (3) Time: 500 hours 时间 Water drops shall be removed. 擦水珠	Contact resistance: <u>200</u> mΩ Max. 接触电阻 Insulation resistance: <u>50</u> MΩ Min. 绝缘电阻 Item 6.1.3、6.1.4 Item 6.2.1~6.2.3
6.3.3	<b>Low Temperature Resistance</b> 耐低温	<b>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made:</b> 样品按下列条件进行耐低温试验, 试验后在正常温度和湿度条件下放置 1 小时后测定 (1) Temperature: $-40 \pm 2^{\circ}\text{C}$ 温度 (2) Time: 500 hours 时间 Water drops shall be removed. 擦除水珠	Contact resistance: <u>200</u> mΩ Max. 接触电阻 Insulation resistance: <u>50</u> MΩ Min. 绝缘电阻 Item 6.1.3、6.1.4 Item 6.2.1~6.2.3
6.3.4	<b>Heat Resistance</b> 耐热	<b>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made:</b> 样品按下列条件进行耐热试验, 试验后在正常温度和湿度条件下放置 1 小时后测定 (1) Temperature: $85 \pm 2^{\circ}\text{C}$ 温度 (2) Time: 500 hours 时间	Contact resistance: <u>200</u> mΩ Max. 接触电阻 Insulation resistance: <u>50</u> MΩ Min. 绝缘电阻 Item 6.1.3、6.1.4 Item 6.2.1~6.2.3

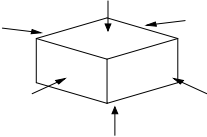
## SPECIFICATION FOR APPROVAL

## 6.3 Durability (使用耐久性能) 表二

Item 项目		Test Condition 测试条件	Requirements 要求
6.3.5	<b>Change of Temperature</b> 温度循环	<p>Following ten cycles of high temperature test .The 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,试验后在正常温度和湿度条件下放置 1 小时后测定</p>  <p>温度(°C)</p> <p>时间(hour)</p> <p>A: <math>+85 \pm 2^\circ\text{C}</math>                      B: <math>-40 \pm 2^\circ\text{C}</math>                      C: 1 小时                      D: 5 minutes                      E: 1 小时                      F: 5 minutes</p> <p>Cycling: 20 cycles                      周期: 20 次</p>	Contact resistance: <u>200</u> mΩ Max. 接触电阻 Insulation resistance : <u>50</u> MΩ Min. 绝缘电阻 Item 6.1.3、6.1.4 Item 6.2.1~6.2.3
6.3.6	<b>Salt Spray Test</b> (Iron material does not require salt spray) 盐雾试验 (铁材质不做盐雾要求)	<p>The salt spray test shall be conducted at the following conditions : 样品按下列条件进行盐雾试验</p> <p>(1)Density(浓度): 溶液(<math>5 \pm 1</math>)% Nacl (质量百分比)</p> <p>(2)Temperature: <math>35 \pm 2^\circ\text{C}</math> 温度</p> <p>(3) Time: 24 hours 时间</p>	<p><b>No remarkable corrosion shall be recognized in metal part</b></p> <p>金属件上没有腐蚀斑点</p>

SPECIFICATION FOR APPROVAL

6.3 Durability (使用耐久性能) 表三

Item 项目		Test Condition 测试条件	Requirements 要求
6.3.7	<p><b>Vibration Resistance</b> 耐振动</p>	<p><b>Measurements shall be made following the test set forth below:</b> 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:1.5mm 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)2 hours each ,for a total of 6hours.每方向 2 小时,共 6 小时</p>	<p>Item 6.1 Item 6.2.1、6.2.2</p>
6.3.8	<p><b>Impact Shock Resistance</b> 抗冲击</p>	<p><b>Measurements shall be made following the test set forth below:</b> 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</p> <div data-bbox="742 1585 949 1720" style="text-align: center;">  </div>	<p>Item 6.1 Item 6.2.1、6.2.2</p>

## SPECIFICATION FOR APPROVAL

## 7. Welding conditions (焊接条件)

Item 项目		Recommended conditions 推荐条件	
7.1	<b>Soldering heat test</b> 耐焊接热	<b>Please practice according to bellow conditions:</b> (1)Soldering temperature : $\leq 260^{\circ}\text{C}$ (2)Continuous soldering time: $\leq 5\text{ S}$ 请按以下条件进行焊接: (1)焊锡温度: $\leq 260^{\circ}\text{C}$ (2)连续焊接时间: $\leq 5\text{ S}$	<b>No damage (electrical an mechanical)</b> 无异常(电气、机械特性)
7.2	<b>Solderbility</b> 可焊性	<b>After sprated flux</b> 涂上助焊剂后 Temperature: $260\pm 5^{\circ}\text{C}$ 温度: $260\pm 5^{\circ}\text{C}$ Soldering time: $2\pm 0.5\text{ sec}$ 焊接时间: $2\pm 0.5\text{ sec}$	<b>90% or more of surface area of the portion immersed in solder shall be covered by new solder</b> 90% 或更多的浸焊面积能被焊锡覆盖

## 8. 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 天以下

## SPECIFICATION FOR APPROVAL

**9. Packaging Transportation Storage (包装、运输、贮存)****9.1 Packaging (包装)**

**Products for the inner packing box, packing( ) got stuck in, and of the product name, specifications and model number of the date of production and other information.**

产品内包装为小纸盒包装，装（贴）入合格证，注明产品名称、规格型号、数量生产日期等信息。

**(1) Exterior package is carton, facing the packing list, the packing list marked with product name, specification model, quantity, date of dispatch.**

外包装为纸箱，贴装箱单、装箱单上注明产品名称、规格型号、数量、出货日期

**(2) The product in the box must not rock.**

产品在箱内不晃动

**9.2 Transportation (运输)**

**Allow for any way transportation, can't get wet and mechanical in jury.**

允许用任何方式运输，勿淋湿及机械性损伤

**9.3 Storage (贮存)**

**The connector of packing finished should be in the ambient temperature between -10°C to +40°C, Relative humidity ≤ 80%. To store in storehouse does not have acidic, alkaline air and other corrosive gas in the ambient air.**

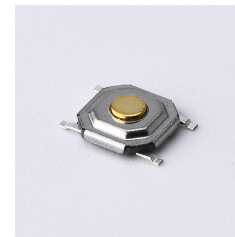
包装完毕的轻触开关应在环境温度为 -10°C ~ +40°C，相对湿度 ≤ 80%，周围空气中没有酸性，碱性及其它腐蚀性气体的库房

# PRODUCT DRAWINGS (产品图纸)

RoHS  
Compliant

高度H/mm				
1.5	1.6	1.7	1.8	2.0
2.3	2.5	2.8	3.0	3.2
3.5	3.7	4.0	4.3	4.5
5.0	5.5	其它		

按力gf		
180	260	其它
寿命/万次		
≥5		



主要技术参数、性能  
The Main Thchnology Performance

额定电流、电压 Rate voltage, current	50mA DC12V
接触电阻 Contact resistance	≤100mΩ
按力 Operating force	±50gf
行程 Travel	0.20±0.10mm
绝缘电阻 Insulated resistance	≥100MΩ
介电强度 Dielectric strength	≥250VAC/1min

1

1

2

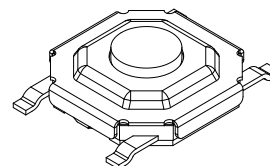
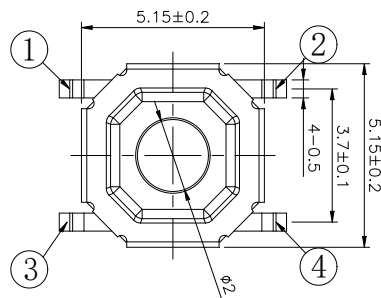
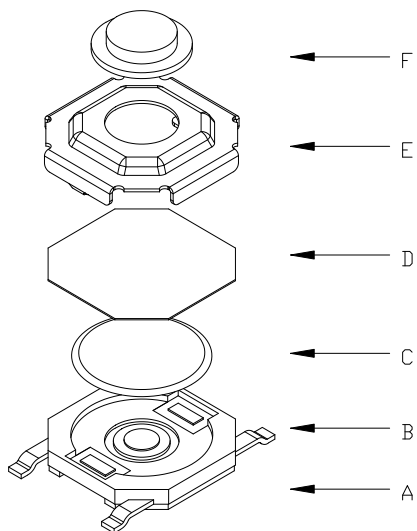
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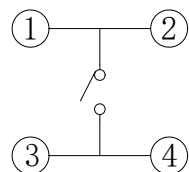
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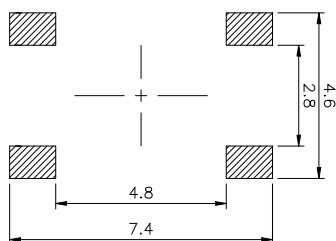
4



F	按钮	黄铜	1	酸洗
E	盖板	不锈钢	1	清洗
D	防尘膜	聚酰亚胺	1	黄色
C	弹片	不锈钢	1	镀银
B	本体	PPA	1	黑色
A	卡件	黄铜	1	镀银
项目 ITEM	名称 DESCRIPTION	材质 MATERIAL	数量 QTY	表面处理/颜色 FINISH/COLOR



电路图  
CIRCUIT DIAGRAM



PCB. 焊接图  
PCB. WELDING DRAWING

标记 SING	处数 FREQUENCY	更改文件号 REVISION	签名 APPROVED	日期 DATE	比例 SCALE	1:1	一般公差 GENERAL TOLERANCE
设计	DESIGN	叶博靖	2025.02.15	单位	mm	≥0~2<	±0.15
审核	CHECKED	叶纪镇	2025.02.16	重量	WEIGHT	≥2~5<	±0.25
批准	APPROVED	叶纪杰	2025.02.17			≥5	±0.35
						角度	±0.5°
						ANGLE	



名称/NAME:  
轻触开关  
TACTILE SWITCH

型号/MODEL:  
4X4铜钮方盖四脚立贴



F

E

D

C

B

A