



东莞市铭标电子科技有限公司
MINGBIAO ELECTRONICS CO., LTD

承 认 书

APPROVE SHEET

客户名称 Customer: _____

品 名 Part name: Tact Switch

型 号 Part Number: TVBP27-050CB-R

Design/Date	Check/Date	Review/Date	Approval/Date

贵公司承认印 Approval signatures

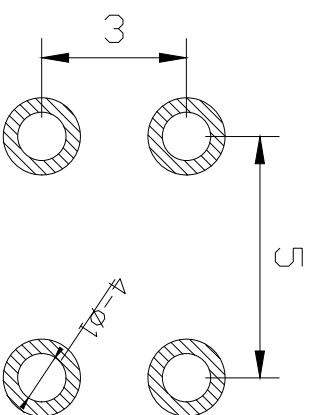
Approval/Date	Remark

Send us a copy of reference , thank you! 日期 Date:

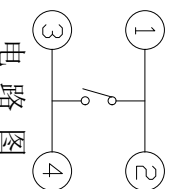
地址: 广东省东莞市长安镇沙头社区猫山东路 101 号

Add: Dongguan City, Guangdong Province, Chang'an Town, Sand head community The cat shandong road, No. 101

Ntel: 0769-81581583

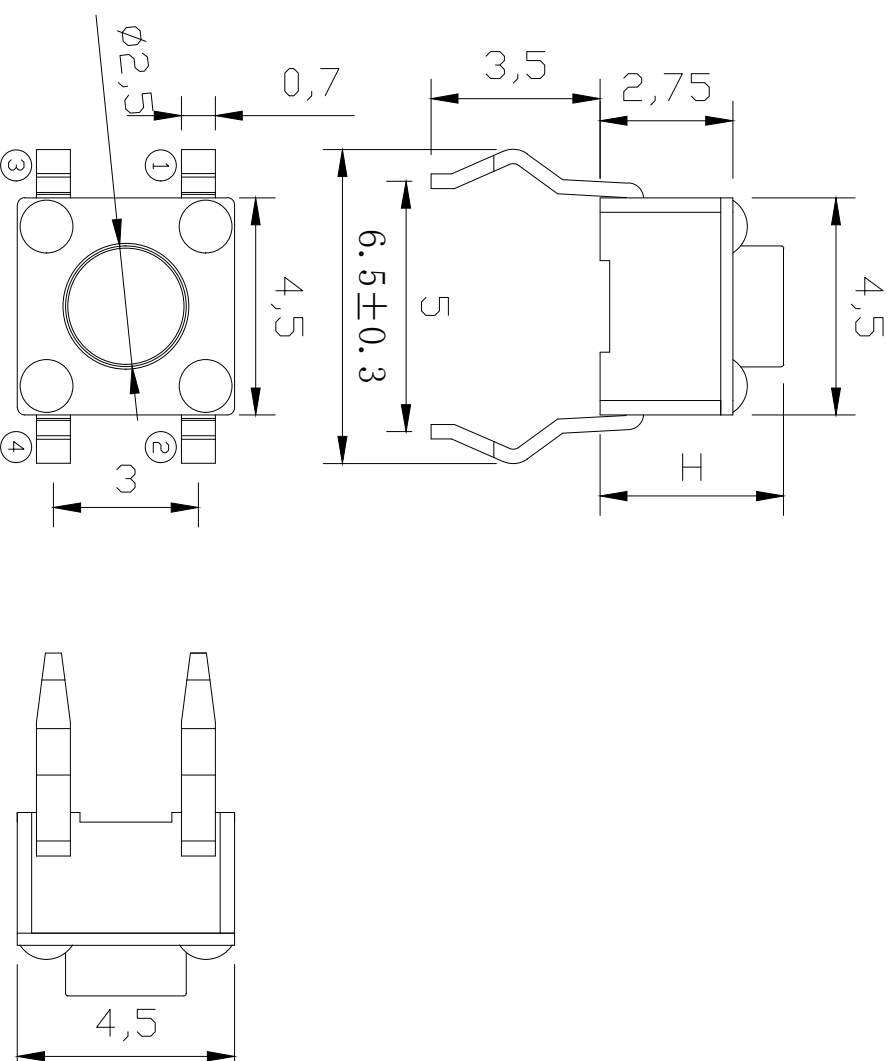


PCB 焊接图



电路图

H
3.5
3.8
4.3
4.5
5.0
5.5
6.0
6.5
7.0



主要技术规格:

1. 额定值: 50mA DC12V
2. 接触电阻: $\leq 100m\Omega$
3. 操作力: $260 \pm 40gf$
4. 行程: $0.25 \pm 0.1mm$
5. 绝缘电阻: $\geq 100M\Omega$
6. 抗电强度: 250V 50HZ 1Min.
7. 寿命: 50,000 Cycles

材料:

本体:	PPA	(黑色)
按钮:	PPA	(黑色)
卡件:	黄铜	(镀银)
弹片:	不锈钢	(镀银)
盖板:	黄铜	(镀铜锡)

 东莞市铭标电子科技有限公司 Ming Mark Electronic Technology Co., Ltd. RoHS				第一视角		名称: 轻触开关	
标记	处数	更改文件号	签名	日期	比例	一般公差	
设计	邱尚林	2018.08.18	2018.08.18	mm	>0.5~2	±0.10	
审核	韦标骥	2018.08.18	2018.08.18	重量	>2~5	±0.25	
批准	朱明华	2018.08.18		角度	>5~10	±0.30	
						型号: TVBP27-050CB-R 4.5×4.5插脚	



SPECIFICATION

Page

1/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

1. General Specification 基本说明

1.1 Scope 范围 This specification covers the requirements for single key switches which have no key top(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 to+70°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.)

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 (40±2°C) 温度

Relative humidity (65±5%) 相对湿度

Pressure (860 to 1060 mbars) 压力

2. Type Of Actuation 动作类型

Tactile feedback 轻触返回

3. Contact Arrangement 1 poles 1 throws

接触形式 1 接点 1 回路

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

细接点形式在装配图中

4. Maximum Ratings DC 12 V 50 mA 最大额定值

DC 1 V 10 μA 最小额定值



SPECIFICATION

Page

2/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

2、 详细说明

Detailed specification

2.1 外观：应无影响、降低产品性能的缺陷；

Appearance: There should be no defects that affect the serviceability of product.

2.2 结构尺寸和安装尺寸：应符合装配图要求；

Style and dimension: shall conform to the assemble drawings.

2.3 操作形式：有触觉反应的操作

Type of actuating: Tactile feedback.

2.4 开关结构：单回路单输出(具体的触点结构在装配图中已绘出)；

Contact arrangement: 1 pole, 1 throw

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

3. 电气性能：

ELECTRICAL SPECIFICATI

NO.	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENTS
3.1	接 触 电 阻 Contact Resistance	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 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.	$\leq 50m \Omega$
3.2	绝 缘 电 阻 Insulation Resistance	在端子与端子之间,端子与外壳之间施加 DC100V, 一分钟 Measurements shall be made following application of DC100V potential between terminals and between individual terminals and frame for one minute.	$\geq 100M \Omega$
3.3	介质耐压 Dielectric voltage proof	在端子与端子之间,端子与外壳之间施加 AC250V(50HZ-60HZ) AC <u>250</u> V (50Hz or60Hz) shall be applied between terminals and between individual terminals and frame for one minute.	无击穿、闪烁现象 There shall be no breakdown.



SPECIFICATION

Page

3/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

NO.	项目 ITEM	试验条件 TEST CONDITONS	要求 REQUIREMENTS
3.4	触点抖动 Bounce	<p>按照正常使用时的力度轻按手柄中心（每秒 3~4 次），在导通和断开过程中测试开关抖动</p> <p>Lightly striking the center of the stem at a rate encountered in normal use (3 to 4times per second), and bounce shall be tested at “ON” and “OFF”</p>	<p>ON:10ms max 以下 OFF: 10ms max 以下 耐久寿命测试后 ON 和 OFF 各: 20ms max 以下</p>
<p>4、机械性能 MECHANICAL SPECIFICATION</p>			
4.1	按力 Operating Force	<p>开关垂直于操作方向放置，在开关驱动件顶端中心逐渐施力，测量开关导通所需的最大力度。</p> <p>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 switch to come to a stop shall be measured.</p>	<p>按力 160±40gf 250±40gf</p>
4.2	最大行程 Full Travel	<p>开关垂直于操作方向放置，以一个等于 2 倍按力的静负荷施加在开关驱动件顶端中心，测量顶端移动的距离。</p> <p>Placing the switch such that the direction of switch operation is vertical and then applying static load of 2times operating force to the center of the stem; the travel distance for the switch to come to a stop shall be measured.</p>	<p>0.25±0.10mm</p>



SPECIFICATION

Page

4/10

Version

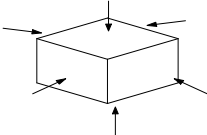
A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

NO.	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENTS
4.3	回弹力 Return Force	<p>开关垂直于操作方向放置，在开关驱动件顶端中心下降至全行程后，测量顶端向自由位置转换的力度。</p> <p>The sample switch is installed such that the direction of switch operation is vertical and upon depressing the stem in its center to the whole travel distance, the force of the stem to return to its free position shall be measured.</p>	<p><u>65</u> gf min</p>
4.4	停止强度 Stop Strength	<p>开关垂直于操作方向放置，从操作方向向驱动件施加 3KG 的静负荷持续 60 seconds。</p> <p>Placing the switch such that the direction of switch operation is vertical, and then a static load of 3KG shall be applied in the direction of stem operation for a period of 60 seconds.</p>	<p>无机械和电气损坏 There shall be no sign of damage mechanically and electrically.</p>
4.5	Impact Shock Resistance 抗冲击	<p>Measurements shall be made following the test set forth below: 按下列条件进行冲击试验</p> <p>(1)Acceleration:80G 加速度</p> <p>(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> 	<p>Item 6.1 Item 6. 2.1、6.2.2</p>



SPECIFICATION

Page

5/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

5、极限电气性能:

ENVIRONMENTAL SPECIFICATION

NO	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENTS
5.1	低温测试 Resistance to low temperature	样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) 温度：-40±2℃ Temperature : -40±2℃ (2) 时间：96 h Time: 96 hours Water drops shall be removed. 擦除水珠	
5.2	高温测试 Heat resistance	样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) 温度：85±2℃ temperature:85±2℃ (3) 时间：96 h time: 96hours	接触电阻：≤ 200m Ω Contact resistance: ≤ 200m Ω 绝缘电阻：≤50m Ω Insulation resistance: ≤50m Ω
5.3	温度周期性测试 Change of temperature	根据下面的测试要求进行 5 次循环的温度周期性测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试。测试期间样品应保持干燥。 After 5 cycles of following conditions, the sample shall be allowed to stand under normal temperature and humidity conditions for 1 h. and measurements shall be made. During the test water drops shall be removed. <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>温度(℃)</p> <p style="text-align: center;">时间(hour)</p> </div> <div> <p>A: +85±2℃ B: -40±2℃ C: 2 小时 D: 1 小时 E: 2 小时 F: 1 小时</p> </div> </div> <p style="text-align: center;">Cycling: 20 cycles 周期: 20 次</p>	项目 3,4.1,4.2,4.3 Item 3,4.1,4.2,4.3



SPECIFICATION

Page

6/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

NO.	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENT
5.4	湿温测试 Moisture resistance	样品应以下列实验条件进行测试，实验后样品应放在常 温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) 温度：60±2℃ temperature: 60±2℃ (2) 相对湿度：90%~95% relative humidity:90% to 95% (3) 时间：96h time: 96 hours Water drops shall be removed. 擦除水珠	接触电阻：≤200m Ω Contact resistance: ≤200m Ω 绝缘电阻：≤50m Ω Insulation resistance: ≤ 50m Ω 项目 3,4.1,4.2,4.3 Item 3,4.1,4.2,4.3
5.5	盐雾试验 Salt Mist	在以下设定条件下进行测量： The switch shall be checked after following test: (1) 温度：35℃±2℃ temperature: 35℃±2℃ (2) 盐溶液浓度：5±1%（质量百分比） salt solution : 5±1%(solids by mass) (3) 时间：8h Time:8 hour 实验后的盐沉积物后水冲掉 After test, salt deposit shall be removed by running water.	金属件上没有腐蚀斑点 No remarkable corrosion shall be recognized in metal part.
5.6	Withstand SO ₂ 耐 SO ₂	1) Density:3±1ppm 浓度：3±1ppm 2) Temperature:40±2℃ 温度：40±2℃ 3) Relative humidity:90~95% 相对湿度：90~95% 4) Duration of test:12h 持续时间：12 小时 5) Standard conditions after test:1h 试验后的放置条件：1 小时	接触电阻：≤200m Ω Contact resistance: ≤200m Ω 绝缘电阻：≤50m Ω Insulation resistance: ≤ 50m Ω Item 6.1.3、6.1.4 Item 6. 2.1~6.2.3



SPECIFICATION

Page

7/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019. 10. 04

6、 极限机械性能:

ENDURANCE SPECIFICATION

NO.	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENT
6.1	工作寿命 Operation life	<p>根据下面的测试要求进行测试: Measurement shall be made following the test set forth below:</p> <p>(1) DC 5V, 5mA 带负载 DC 5V, 5mA resistive load</p> <p>(2) 按动速率: 1-2 次/秒 Rate of operation: 1 to 2 times/s</p> <p>(2) 减压力: <u>375</u> g f Depression: <u>375</u> g f</p> <p>(3) 最低寿命: 50,000 次 Min life: 50,000cycles</p>	<p>接触电阻$\leq 200\text{m}\Omega$ Contact resistance$\leq 200\text{m}\Omega$</p> <p>绝缘电阻$\leq 50\text{m}\Omega$ Insulation resistance $\leq 50\text{m}\Omega$</p> <p>按力: 初值的 $\pm 30\%$ Operating Force: initial value $\pm 30\%$</p> <p>项目 3,4.1,4.2,4.3 Item 3,4.1,4.2,4.3</p>
6.2	振 动 Vibration	<p>Measurements shall be made following the test set forth below: 按下列条件进行抗振动试验</p> <p>(1) Range of oscillation: 10 to 55Hz 频率范围</p> <p>(2) Amplitude, pk-to-pk: 1.5mm 振幅: 峰-峰 1.5mm</p> <p>(3) Cycle of sweep: 10-55-10Hz in one minute, approx. 扫描周期: 10-55-10Hz 约一分钟内</p> <p>(4) Mode of sweep: Logarithmically sweep or uniform sweep. 扫描方式: 对数扫描式恒定扫描</p> <p>(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</p> <p>(6) 2 hours each, for a total of 6hours. 每方向2小时. 共6小时</p>	<p>项目 3,4.1,4.2,4.3 Item 3,4.1,4.2,4.3</p>
7、 焊接条件:			
SOLDERING CONDITIONS:			
7.1	手 工 焊 接 Hand soldering	<p>请按以下条件进行焊接:</p> <p>(1) 焊锡温度: $\leq 260^\circ\text{C}$</p> <p>(2) 连续焊接时间: $\leq 5\text{s}\pm 1\text{s}$</p> <p>Please practice according to below conditions:</p> <p>(3) (1) Soldering temperature: 260°C Max.</p> <p>(4) (2) Continuous soldering time: $5\text{s}\pm 1\text{s}$</p>	



SPECIFICATION

Page

8/10

Version

A/0

MODEL

TVBP27-050CB-R

Date

2019.10.04

NO.

项目
ITEM

条件
CONDITIONS

7.2

Solder bility
可焊性

After sprated flux
涂上助焊剂后
Temperature:245±5℃
温度: 245±5℃
Soldering time: 3 S±1 S
焊接时间: 3 S±1 S

90% or more of surface area
of the portion immersed in
solder shall be covered by
new solder
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

9.Reel Packaging 盘装

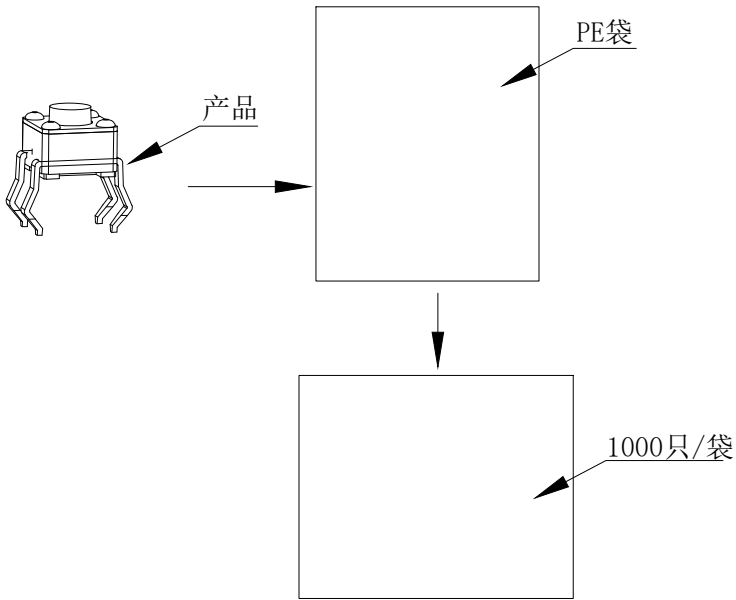
9.1 Scope 范围

This specification covers the requirements of the reel packaging for SMT standard type of tact switches. 该规范包含 SMT 标准型的绕带封装的要求

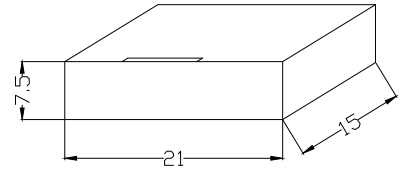
9.2 Packaging Materials 封装材料

Item	项目	Description	说明
Package	包装	Cartons	卡通箱
Reel	转轴	Delete Cartons	可降解箱
Carrier Tape	载带	Polypropylene	聚丙烯

1、用PE袋放入干燥剂及合格证包装好再封口(1000只/袋)

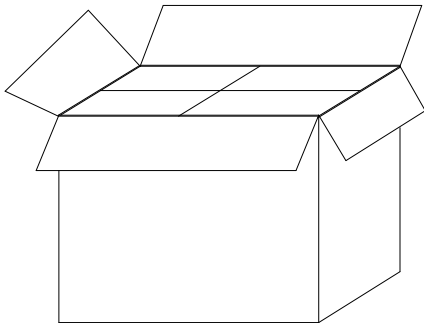


2、将封装好产品放入内包装盒
(1000只/6袋/盒)
内盒尺寸：21*15*7.5



3、将装好产品的内包装盒放入外包装箱

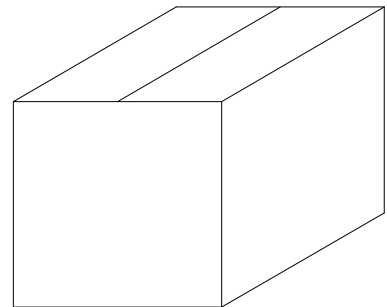
注：内盒尺寸：21*15*7.5
2盒/3层/外箱尺寸：33*23*24 (6盒)
4盒/3层/外箱尺寸：44*32.5*23.5 (12盒)
4盒/5层/外箱尺寸：44*32.5*29 (20盒)



(图片仅供参考)

注：装满后箱内如有空隙请用填充物塞满固定

4、封箱，贴标签



					材料	角度公差	比例	名称	轻触开关
						±1°	1:1		
					电镀颜色	标尺公差	单位	型号	4.5X4.5插脚
						±0.1	mm		
					厚度	日期	版本	类型	包装规范
标记	处数	更改文件号	签字	日期					
设计			标准化		审核	批准			
刘克树			邱尚林		韦标骥	朱明华		东莞市铭标电子科技有限公司	