

客户：(Customer) _____

发行编号： 2019011801 _____

发行日期： 2019.01.18 _____

发行区分： 新规 改定

规格承认书

SPECIFICATION FOR APPROVAL

产品名称： 2.0X3.0 With Stem

贵司型号： _____

敝司型号： TVAF25-HCT-R

本公司确认 Approved Signatures:		
制订 Edit	审核 Check	批准 Approval
刘素琼	朱佳鹏	周成良

客户签核 Customer Approved:

本承认书一式 3 份

请承认后签回

乐清市科舰电子有限公司

规格承认书				规格书编号 2019011801
品名	2.0X3.0 With Stem	型号	TVAF25-HCT-R	1/9

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 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.)

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

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 15 V 20 mA 最大额定值

DC 2 V 10 μA 最小额定值

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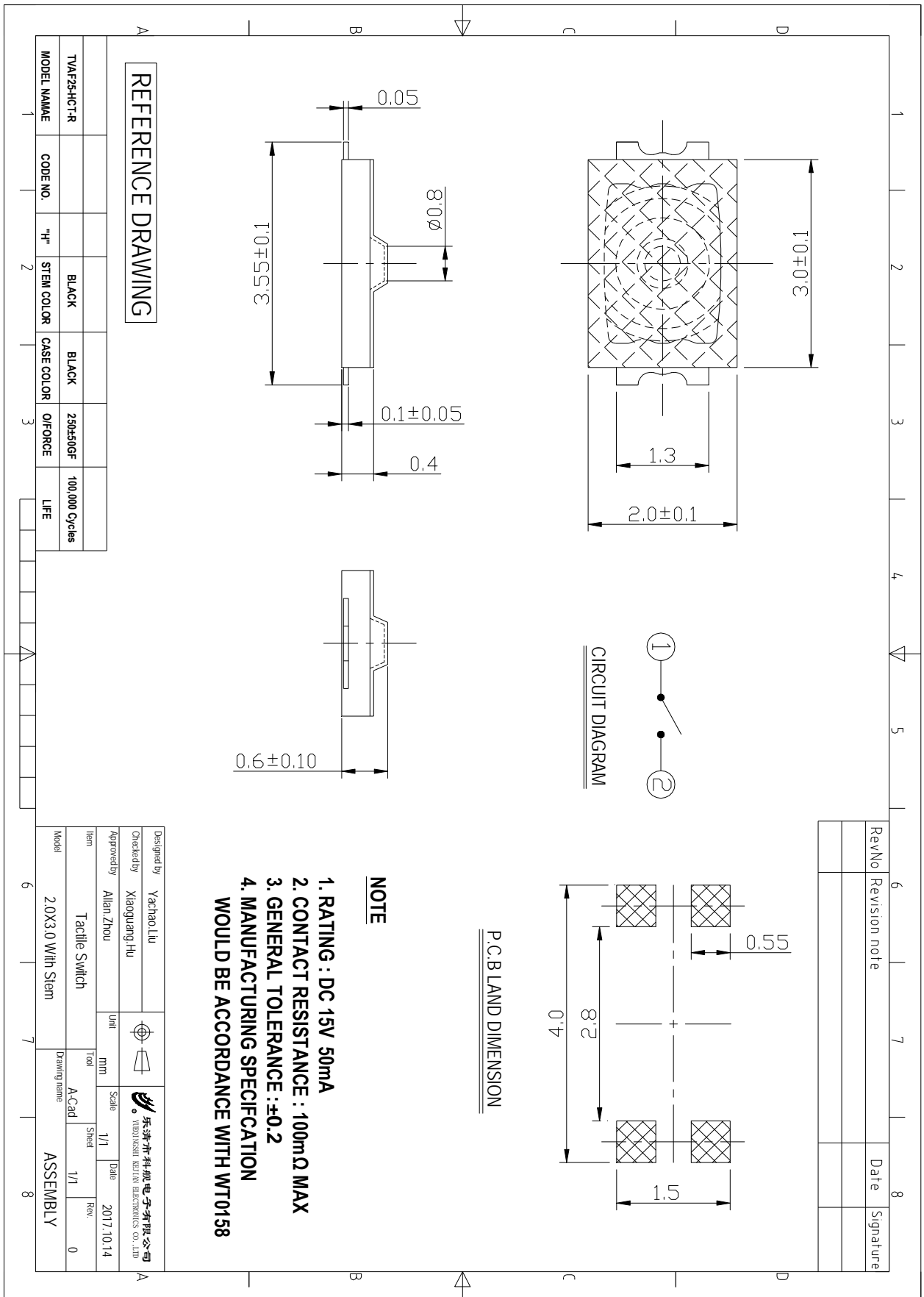
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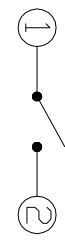


REFERENCE DRAWING

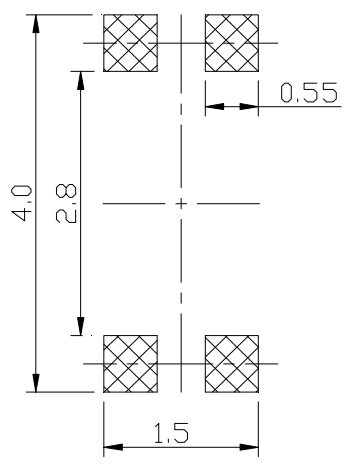
MODEL NAME	TVAF25-HCT-R	CODE NO.	"H"	STEM COLOR	BLACK	CASE COLOR	BLACK	OF/FORCE	250±50GF	LIFE	100,000 Cycles
------------	--------------	----------	-----	------------	-------	------------	-------	----------	----------	------	----------------

1											
2											
3											
4											
5											
6											
7											
8											

CIRCUIT DIAGRAM



P.C.B. LAND DIMENSION



NOTE

1. RATING : DC 15V 50mA
2. CONTACT RESISTANCE : 100mΩ MAX
3. GENERAL TOLERANCE : ±0.2
4. MANUFACTURING SPECIFICATION WOULD BE ACCORDANCE WITH WT0158

Designed by	Yachao Liu	Scale	1/1	Date	2017.10.14
Checked by	Xiaoguang Hu	Tool	AutoCAD	Sheet	1/1
Approved by	Allan Zhou	Unit	mm	Rev	0
Item	Tactile Switch	Drawing name	ASSEMBLY		
Model	2.0X3.0 With Stem				

RevNo	Revision note	Date	Signature

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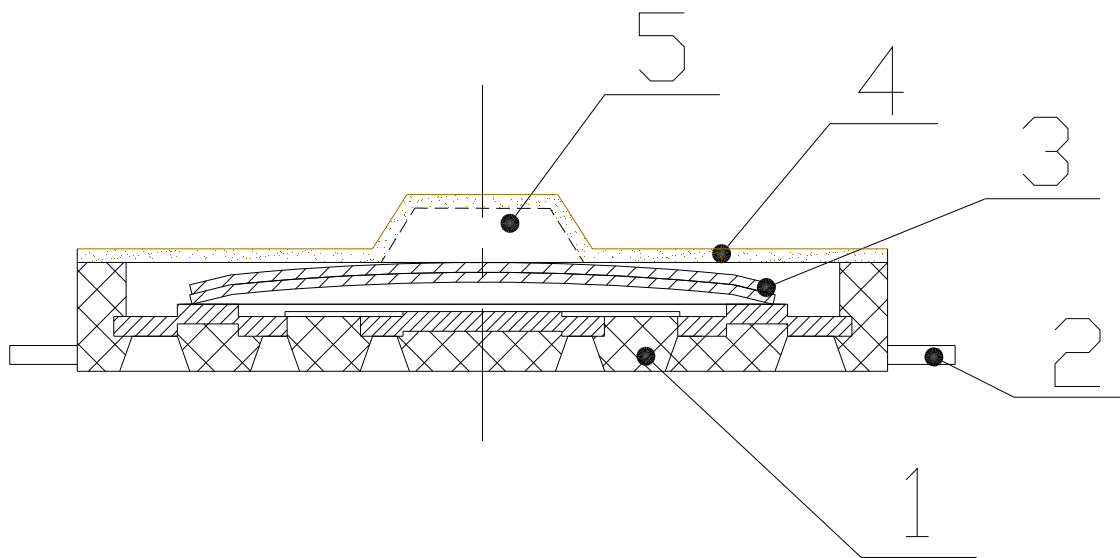
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5.2 构造:



序号	零部件名称	数量	材料名称	表面处理	备注
1	BASE	1	PA6T		BLACK
2	TERMINAL	1	PHOSPHOR BRONZE	Ag plating	
3	CONTACT	2	STAINLESS STEEL	Ag plating	
4	TAPE	1	POLYIMIDE		
5	STEM	1	POLYIMIDE		
6					
7					
8					

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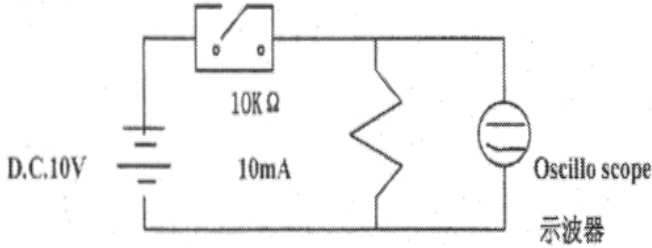
型号

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6. General specification 性能

6.1 电气的性能

Item 项目		Test Condition 测试条件	Requirements 要求
6.1.1	Contact Resistance 接触电阻	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. 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	100m Ω max
6.1.2	Insulation Resistance 绝缘电阻	Measurements shall be made following application of DC100V potential between terminals and between individual 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	100M Ω min
6.1.3	Dielectric withstanding voltage 电气耐压	AC 250 V (50Hz or60Hz) shall be applied between terminals and between individual 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), 一分钟	There shall be no breakdown. 无击穿、闪烁现象
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 when "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 	ON 10ms max OFF 10ms max

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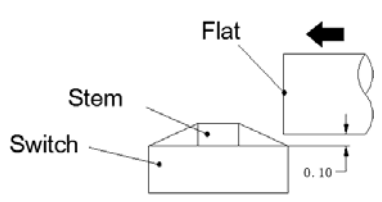
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6.2 机械的性能

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	<u>250</u> ± <u>50</u> gf
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	<u>0.13</u> ± <u>0.05</u> mm
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>70</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迹象
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

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6.3 使用耐久性能

Item 项目	Test Condition 测试条件	Requirements 要求
6.3.1 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 15V 20mA resistive load. DC 15V 20mA 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>375</u> gf 减压力 (4)Cycles of operation: 10×10^4 cycles 动作次数: 10×10^4 次	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 Ite 6.2.2
6.3.2 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,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 Low Temperature Resistance 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,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 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,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

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Item 项目	Test Condition 测试条件	Requirements 要求
6.3.5 Change of Temperature 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. 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> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>温度(°C) ↑</p> <p style="text-align: center;">时间(hour)</p> </div> <div> <p>A: +85±2°C B: -40±2°C C: 1 小时 D: 5 minutes E: 1 小时 F: 5 minutes</p> </div> </div> <p style="text-align: center;">Cycling: 20 cycles 周期: 20 次</p>	<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</p>
6.3.6 Salt Spray Test 盐雾试验	<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(5±1)% Nacl (质量百分比) (2)Temperature: 35±2°C 温度 (3) Time: 24 hours 时间</p>	<p>金属件无发黄、生锈</p>
6.3.7 Vibration Resistance 耐振动	<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 (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>

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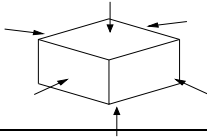
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Item 项目		Test Condition 测试条件	Requirements 要求
6.3.8	Impact Shock Resistance 抗冲击	Measurements shall be made following the test set forth below: 按下列条件进行冲击试验 (1)Acceleration:80G 加速度 (2)Cycles of test :3 cycles each in 6directions, for a total of 18cycles 试验次数:每个方向 3次,6个方向共 18次 	Item 6.1 Item 6. 2.1、6.2.2
6.3.9	Withstand H ₂ S 耐 H ₂ S	1) Density:3 ± 1ppm 浓度: 3 ± 1ppm 2) Temperature:40 ± 2°C 温度: 40 ± 2°C 3) Relative humidity:80 ~ 85% 相对湿度: 80 ~ 85% 4) Duration of test:24h 持续时间: 24 小时 5) Standard conditions after test:1h 试验后的放置条件: 1 小时	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
6.3.10	Withstand SO ₂ 耐 SO ₂	1) Density:3 ± 1ppm 浓度: 3 ± 1ppm 2) Temperature:40 ± 2°C 温度: 40 ± 2°C 6) Relative humidity:80 ~ 85% 相对湿度: 80 ~ 85% 3) Duration of test:24h 持续时间: 24 小时 4) Standard conditions after test:1h 试验后的放置条件: 1 小时	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

7. 焊接条件:

Item 项目		Recommended conditions 推荐条件	
7.1	Soldering heat test 耐焊接热	Please practice according to bellow conditions: (1)Soldering temperature : ≤260°C (2)Continuous soldering time: ≤5 S 请按以下条件进行焊接: (1)焊锡温度: ≤260°C (2)连续焊接时间: ≤5 S	No damage (electrical an mechanical) 无异常 (电气、机械特性)

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Item 项目
Recommended conditions 推荐条件
7.2
**Solderbility
可焊性**

After sprated flux
涂上助焊剂后
Temperature:260±5℃
温度: 260±5℃
Soldering time: 2±0.5 sec
焊接时间: 2±0.5 sec

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

7.3
IPX7

• Water protection 水保护
Let the test samples be exposed to the below test
condition.
让测试样品暴露在以下测试条件下。
Measurement shall be made after 1 hr soak at
normal temperature/humidity.
在常温/湿度下浸泡 1 小时后进行测量。
(1) Depth of Immersion
浸渍深度:1 米
(height from the top of switch and water
surface 从开关的上端到水面的距离)
(2) Duration of Immersion 浸泡时间: 30 min 分
(3) Simply leave switch itself inside water
chamberr. 只需将开关本身留在水室内即可。
(4) Water drops shall be removed. 应除去水滴。

Contact resistance: 50
mΩ Max. 接触电阻
No outstanding penetration
of water which effects the
functionality of switch.
没有水浸透影响开关的
功能

7.3
IP6X

• Dust protection 防尘保护
Let the test samples be exposed to the below test
condition. 让测试样品暴露在以下测试条件下:
After the test, measurement shall be
made.测试结束后, 进行测量。
(1) Amount of talc:2KG/ m3
滑石粉的量:2 公斤/ m3
(2) Time of circulation:8h
循环时间:8h
(3) Simply leave switch itself inside dust chamber.
只需将开关本身留在尘室内即可。
(4) Dusts shall be removed.
表面的处理灰尘可以去除。

Contact resistance 接触电
阻: 500 mΩ Max.
No penetration of dusts
shall be found
inside of switch.
在开关内不应发现粉尘
的渗透

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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 标准型拨动开关的绕带封装的要求

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

9.3 Packaging Quantity 封装数量

9.3.1 The number of the reels. 转轴数量

Twenty (20) reels at maximum. Which contain 300K pcs switches
Shall be packed in a package. 一箱装 20 盘,有 300K 只产品

9.3.2 The number of the switches. 产品数量

15K pcs switches shall be packed in a reel. 一个转轴包 15K 只产品

9.3.3 It should be noted that we regard two cartons 对出口包装需注意用两个箱子包装 mentioned above as on package for export.

