



CUSTOMER NAME	客户名称:	
CUSTOMER NO.	客户编号:	
SERIES	系 列:	轻触开关
MODEL NO.	型 号:	XB-TS-A99 series
DRAWING NO.	图 形 号:	SMD Tact Switch

依据和存档之用，多谢合作！

EXAMINE & APPROVAL 审批

APPROVE 接受	NOT APPROVE 不接受
SIGNATURE 签署 STAMP盖章 DATE日期	

PREPARED BY.制表人	CHECKED BY.校对	APPROVED BY.审核	APPROVAL BY. 批准
研发部 戴海明 2022. 06. 08	品质部 黄自清 2022. 06. 08	工程部 庞军 2022. 06. 08	总经办 吴量 2022. 06. 08

东莞市溪榜电子有限公司

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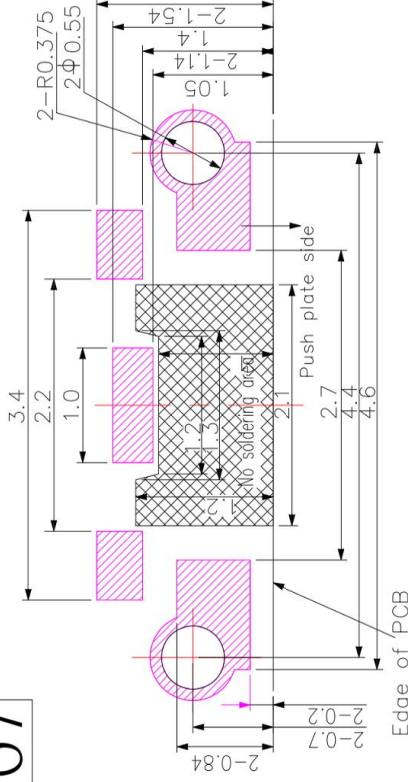
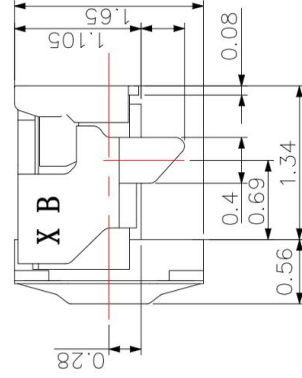
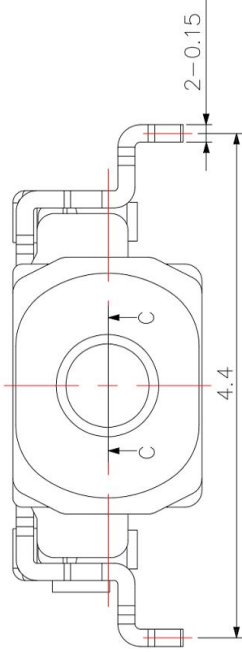
Quality core! Afterburner for Made in China!



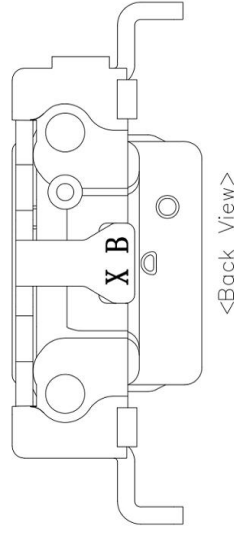
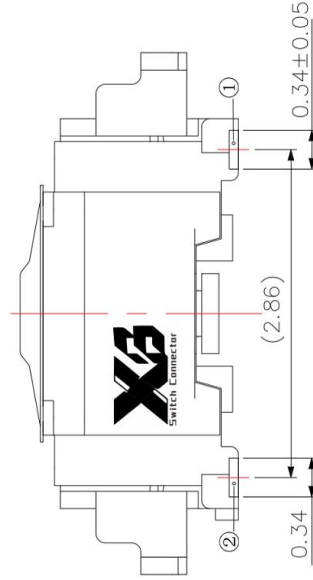
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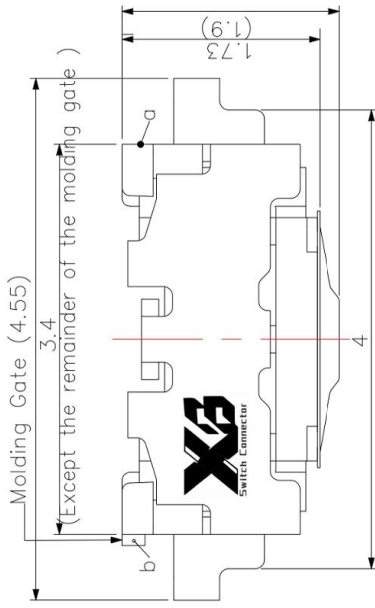
ROHS



Actuator cross section (Section C-C)



<Back View>



CIRCUIT DIAGRAM

SPECIFICATIONS

Rating	DC 15V 20mA.			
Insulation Resistance	50 M Ω Min.			
Contact Resistance	500 m Ω Max.			
Dielectric Withstanding Voltage	AC 250V for 1 min			
Operating Force	0	100 $\pm$ 30gf	2	160 $\pm$ 50gf
Operating Life (cycles)	3 240 $\pm$ 50gf 500,000			

8					TOLERANCE										
7					UNLESS SPECIFIED										
6					WITHIN 1.5mm : ±0.1mm			A	2012-9-25	初 版		ZENQ. CHEN			
5					OVER 1.5mm : ±0.2mm			ISSUE	DATE		DESCRIPTIONS OF REVISION	APPD.			
4	CONTACT	SUS	1	Ag CLAD	TITLE : Tact Switch			UNIT : mm			DRWG NO.: XB-TS-A99				
3	CASE	PPA/BRASS SRTIP	1	BLACK/Ag PLATED	MODEL: XB-TS-A99			SCALE: 5:1			JUN. YANG	2012-9-25			
2	COVER	STEEL STRIP	1	Ni PLATED	 东莞市溪榜电子有限公司 DONG GUAN XI BANG ELECTRONI CS CO., LTD. Switch Connector								CHK'D	DONG. PANG	2012-9-25
1	KNOB	PPA	1	BLACK									APPD.	ZENQ. CHEN	2012-9-25
NO.	PARTS	MATERIALS	Q'TY	FINISH											



东莞市溪榜电子有限公司

DONG GUAN XI BANG ELECTRONICS CO., LTD.

文件编号
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XB-TS-A99

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1

发布日期
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2023 年 05 月 08 日

PRODUCT SPECIFICATION 产品承认书

文件版本 EDITION

第A 版第 1 次修订

1. General Characteristics 一般特性:

适用范围:

1.1 、 This specification is applied to the requirements for TACTILE SWITCH (MECHANICAL CONTACT)

此规格书适用于机械式轻触开关的相关要求

1.2 Operating Temperature Range: -40℃to85℃ 使用温度范围: -40℃to 85℃

1.3 Operating Relative Humidity: ≤90%RH 相对湿度: ≤90%RH

1.4 Test Conditions: Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows:

实验条件: 若没有特别说明, 则试验大气条件如下: Ambient Temperature: 5~35℃, Relative Humidity: 45~85% 环境温度: 5~35℃, 相对湿度: 45~85%

Air Pressure: 86~106Kpa (860~1060mbar)

大气压力: 86~106Kpa (860~1060mbar)

2. Appearance, Structure and Dimensions 外观, 结构及尺寸:

2.1 Appearance: The switch shall have good finishing, and no rust, crack or plating defects.

外观: 产品外观良好, 无锈蚀、裂纹和镀层缺陷。

2.2 Structure & Dimensions: Refer to individual product drawing.

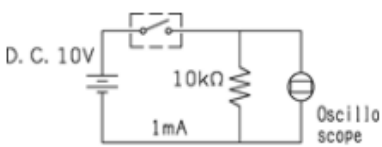
结构及尺寸: 参见产品图纸

2.3 Markings: Refer to individual product drawing.

标识: 参见产品图纸。

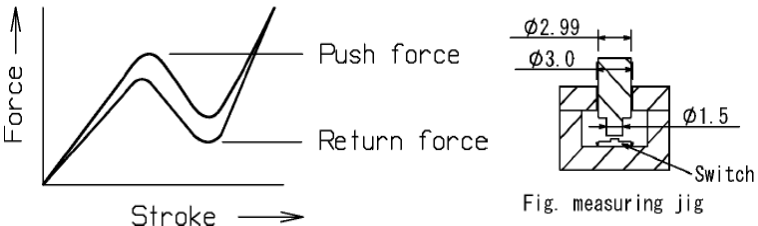
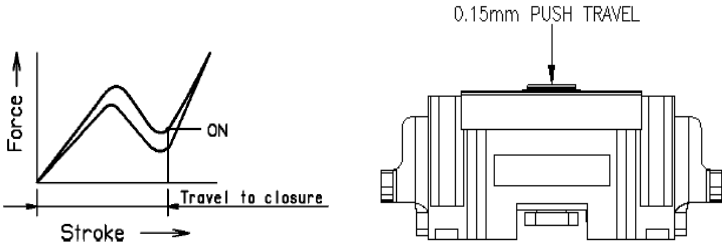
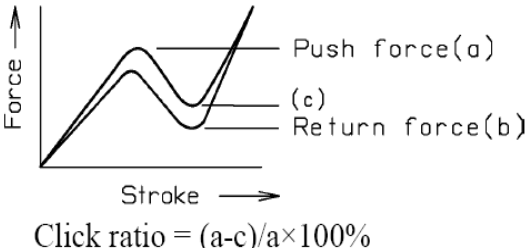
3. Ratings 额定负荷: DC12V 50mA

4. Electrical Characteristics 电气特性

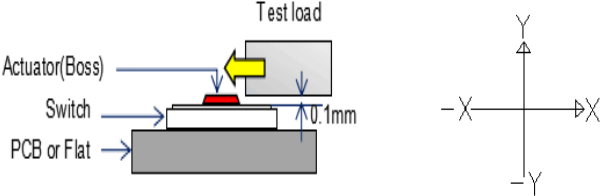
NO.	Item 项目		
4.1	Contact Resistance 接触电阻	500mΩ Max.	在以 5V 10mA 的直流电源或不低于 1KHz 的交流电源的电路中, 以一个等于 2 倍按力的静负荷施加于手柄中心 Applying a static load of 2 times operating force to the center of the stem, measurements shall be made by 5V DC 10mA or more than 1KHZ AC small-current contact resistance meter.
4.2	Resistance Insulation 绝缘电阻	50MΩ Min.	Measurement shall be made following application of 100V DC potential, across terminals, and across terminals and cover, for one minute. 在端子之间施加DC 100V /1min 的条件下,测量端子之底座、盖板的电阻值。
4.3	Dielectric Voltage 抗电强度	No dielectric breakdown shall occur. 无击穿现象发生	250VAC (50~60Hz, cut-off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for 60±5s. 在相互绝缘的所有接线端子之间 250V (50-60Hz) 交流电, 各接线端子与外壳或非载流金属零件之间加载 250V (50-60Hz) 交流电, 持续时间 60±5S。
4.4	Bounce 触点抖动	ON :10ms Max OFF:10ms Max	Operation speed : 3~4 times 操作速率: 3~4次/秒  Switch Bouncing Test Circuit

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PRODUCT SPECIFICATION 产品承认书		文件版本 EDITION	第A 版第 1 次修订	

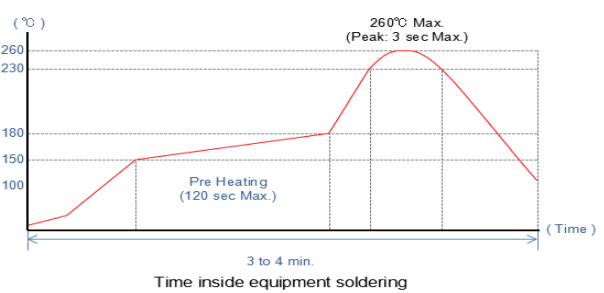
5. Mechanical Characteristics 机械特性

NO.	Item 项目	Criteria 标准	Test Method 实验方法
5.1	Operating Force 操作力	Push force 按压力 $160 \pm 50\text{gf}$ Return force 回复力 20gf min	Operation feeling shall be measured after 3 times pre-operations. Pre-operation condition : 3 times, 1mm/s by 6 N Measurement speed : 0.5 mm/s 动作力测定前实施3次预动作。 预动作条件：测定速度 1mm/s,按压力 6 N 测定速度：0.5mm/s 
5.2	Operation Position 操作位置	$0.15 \pm 0.05\text{mm}$	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。 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. 
5.3	Click ratio 感触率	40% Min	Measurement condition: No.5.1 测定方法参照 5.1  Click ratio = $(a-c)/a \times 100\%$

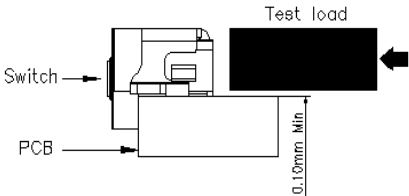
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NO.	Item 项目	Criteria 标准	Test Method 实验方法
5.4	Vibration Proof 振动	After test, Contact resistance:500 mΩ Max. No functional defective occur No abnormalities shall be recognized in appearance and construction. 实验后： 接触电阻： 500 mΩ Max. 无功能性不良。 表面及结构无明显变形	Switch shall be secured to a testing machine by a normal mounting device and method. Switch shall be measured after following test. (1) Vibration frequency range 10~55 Hz (2) Total amplitude 1.5mm (3) Sweep ratio: 10~55~10Hz Approx. 1 min (4) Method of changing the sweep vibration frequency: logarithmic or linear (5) Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours (6 hours in total) 开关采用常规的安装方法牢固地安装在试验设备上，并在下述参数条件下进行试验： (1) 振频 10-55Hz (2) 振幅 1.5mm (3)振动变化速率： 10-55-10Hz 大约 1 分钟 (4) 变频方法：对数或线性型式 (5) 振动方向：三个相互垂直的方向，其中一个方向应是促动元件运动的方向。 (6) 时间：每个方向 2 小时（共 6 小时）。
5.5	Contact thrust 触点侧向推力	The contact and film are not broken and partial, and have no functional defects. 实验后：触点和膜无破裂和偏位，无功能性不良	Apply 3N /15Sforce to the contact X/Y in four directions at a speed of 5mm/min. 对触点X/Y四个方向施加3N/15s外力，速度5mm/min 
5.6	Terminal Strength 端子强度	Shall be free from terminal looseness,damage and insulator breakage No functional defective occur 端子无松动，损坏及绝缘层的破裂；无功能性不良。	A static load of 0.5N shall be applied to the tip of terminal in a desired direction for 10 ± 1s. The test shall be done once per terminal. 以0.5N 作用力沿轴向逐渐施加于接线末端10±1s（作用力方向为离开开关向外指向），每个接线端子测量一次。

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NO.	Item 项目	Criteria 标准	Test Method 实验方法
5.7	Solder Ability 可焊性	More than 95% of immersed part shall be covered with solder. (Except the cross section) 超过 95% 的浸锡面积被焊料所覆盖。(截面除外)	Switch shall be tested according to the following request: (1) Equipment: Auto-Dip Chamber (2) Solder: M705/SN-3.0Ag-0.5Cu (senju metal) (3) Flux: CF-110VH-2A(Tamura kaken) (4) Soldering Condition: 260 ±5 °C 2±0.5S (5) stencil thickness: 0.1mm, The thickness of the solder paste: ≤0.12mm (6) Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting. (7) Prohibit contact items: alcohol, gasoline, Isophorone 开关在下述参数条件下进行试验: (1) 设备: 自动焊接机 (2) 焊料: M705/SN-3.0Ag-0.5Cu (千住金属) (3) 焊剂: 推荐CF-110VH-2A(Tamura化研) (4) 焊接条件: 260±5℃ 2±0.5秒 (5) 建议钢网厚度为 0.1mm, 所刷锡膏厚度≤0.12mm。 (6) 浸渍深度: 接线端应浸到开关根部处。 (7) 禁止使用酒精, 汽油, 慢干水 (异佛尔酮) 等化学物品接触开关。
5.8	Solder Heat Resistance 耐焊接热	No abnormalities shall be observed in appearance and operation. No functional defective occur 无外观及功能损坏。无功能性不良。	Please practice according to below condition: 1. Preheat :150℃-180℃ 120S Max 2. Soldering heat : 260℃ Max 3S. 3.Reflux times: maximum 2 times 4.Manual welding / maintenance: soldering iron / air duct below 60W, maximum 350 °C, welding time less than 3 seconds, limited once 焊接方法: 1.预热:150℃-180℃ 120S Max 2. 最高焊接温度: 260℃ Max 3S. 3.回流次数: 最大2次 4.手工焊接/维修: 60W以下烙铁/风筒, 最大350℃, 焊接时间3秒以内, 限定一次 

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NO.	Item 项目	Criteria 标准	Test Method 实验方法
5.9	Resistance to Flux 抗焊剂能力	Flux shall not be risen up to contact. The switch shall be free from abnormalities in operation. 焊剂不得上升进入开关内部，影响接触转换。试件在操作过程中不应发生变形。	switch shall be tested according to the following request: (1)switch Equipment: Auto-Dip Chamber (2)Solder: M705/SN-3.0Ag-0.5Cu (senju metal) (3) Flux:CF-110VH-2A(Tamura kaken) (4) Soldering Temperature: 260 ± 5 °C (5)Immersing Time: 2 ±0.5s (6)immersion depth: the terminal shall be immersed to the place away from the root. 开关在下述参数条件下进行试验: (1) 设备: 自动焊接机 (2) 焊料: M705/SN-3.0Ag-0.5Cu (千住金属) (3) 焊剂: 推荐CF-110VH-2A(Tamura化研) (4) 焊接温度: 260 ±5℃ (5) 浸渍时间: 2 ±0.5s (6) 浸渍深度: 接线端应浸到离开开关根部处。
5.10	Weld strength 焊接强度	No abnormalities shall be observed in appearance and operation. No functional defective occur 无外观及功能损坏。无功能性不良	-.After Reflow engineering, 10sec is applied from the side with a strength of 15N.(reference Reflow conditions) -.Reflow工程后如下图从侧面以15N的力度施加10sec.(参照Reflow条 

6. Durability characteristics			
NO.	Item 项目	Criteria 标准	Test Method 实验方法
6.1	Mechanical Life 机械寿命	After test, Contactresistance:20Ω Max. Insulation resistance: 50MΩ Min. Tolerance of operating force Disintegration shall be within 30% of specified value No functional defective occur The switch shall be free from abnormalities in appearance construction.	Action speed: 2-3 times / second Press pressure: 4 N Press times: 300000 times 动作速度: 2-3次/秒 按压力: 4 N 按压次数: 30万次
6.2	Electronics Life 电气寿命	实验后: 接触电阻: 20Ω Max. 绝缘电阻: 50MΩ Min. 操作力衰变应在 ±30% 以内。无功能性不良。开关外观及结构应无损坏。	Action speed: 2-3 times / second Press pressure: 4 N Press times: 300000 times Load: DC15V 20mA 动作速度: 2-3次/秒 按压力: 4 N 按压次数: 30万次 负载: DC15V 20mA



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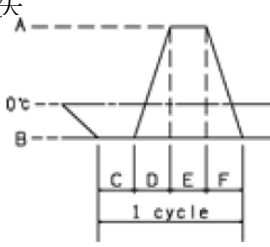
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NO.	Item 项目	Criteria 标准	Test Method 实验方法
6.3	Hydraulic strength test 静压测试	Operating force/time 操作力: 50N/15S	In the Switch operation force, 50N is kept under pressure for 15 seconds, the device is not damaged, and the mechanical and electrical properties meet the specifications 在Switch操作力方向以50N按压力保持15秒, 器件无损坏, 机械和电气性能满足规格;

7. Weather Proof Characteristics 耐候性能:

NO.	Item 项目	Criteria 标准	Test Method 实验方法
7.1	Cold Proof 低温	After test, Contactresistance:1000m Ω Max. Insulation resistance: 50MΩ Min.	After testing at $-40 \pm 2^{\circ}\text{C}$ for 500 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $-40 \pm 2^{\circ}\text{C}$ 的温控箱内保持 500 小时, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失。
7.2	Hot Proof 高温	No functional defective occur The switch shall be free from abnormalities in appearance & construction. 实验后: 接触电阻: 1000mΩ Max.	After testing at $85 \pm 2^{\circ}\text{C}$ for 500 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. 试件在 $85 \pm 2^{\circ}\text{C}$ 的温控箱内保持 500 小时, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失。
7.3	Moisture Resistance 恒定湿热	绝缘电阻: 50MΩ Min. 无功能性不良。 开关外观及结构应无损坏。	After testing at $60 \pm 2^{\circ}\text{C}$,90~95% RH for 500 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $60 \pm 2^{\circ}\text{C}$, 90~95%RH 的温控箱内保持500小时, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失。
7.4	Temperature Cycling 温度转换	After test, Contactresistance:1Ω Max. Insulation resistance: 10MΩ Min. No functional defective occur The switch shall be free from abnormalities in appearance & construction. 实验后: 接触电阻: 1Ω Max. 绝缘电阻: 10MΩ Min. 无功能性不良。	After 20 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件按下述实验条件试验 20次, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失  A: $+85 \pm 2^{\circ}\text{C}$ B: $-40 \pm 2^{\circ}\text{C}$ C: 1 hour D: 5 minutes max. E: 1 hour F: 5 minutes max.

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NO.	Item 项目	Criteria 标准	Test Method 实验方法
7.5	Salt Mist 盐雾实验	No remarkable corrosion shall be recognized in metal part. 在金属件上没有影响开关性能的斑点	The switch shall be checked after following test: (1) Temperature: $35 \pm 2^{\circ}\text{C}$ (2) Salt Solution: $5\% \pm 1$ (Solids by mass) (3) Duration: No action environment 24 ± 1 hour After test, salt deposit shall be removed by running water. 试件在下述实验后测量: (1)温度: $35 \pm 2^{\circ}\text{C}$ (2)盐溶液浓度: $5\% \pm 1$ (质量百分比) (3)时间: 无动作环境下 24 ± 1 小时 实验后的盐沉积物用水冲掉。
7.6	Water/Dust proof test 防水防尘测试	Capacity: IP67 等级: IP67	on the basis of IEC529 根据 IEC529
7.7	Withstand H ₂ S 耐硫化	试验后 接触电阻: $1000\text{m}\Omega$ Max. 绝缘电阻: $50\text{M}\Omega$ Min. 无功能性不良。开关外观及结构应无损坏	1. Density : $3 \pm 1\text{ppm}$ 2. Temperature : $40 \pm 2^{\circ}\text{C}$ 3. Relative humidity : $80 \sim 85\%$ 4. Duration of test : 24h 5. Standard conditions after test : 1h

8. Other

NO.	Item 项目	Criteria 标准
8.1	Storage Condition 保存条件	(1) Storage Environment -20 to 50°C , 20 to $85\%\text{RH}$. (Storage in high temperature and high humidity shall be avoided.) (2) Storage Period Maximum of three months after shipment or six months in a plast bag (vinyl) that is not opened. (1) 保存环境 温度: -20 - 50°C , 相对湿度 20 - 85% (应当避免高温高湿环境)。 (2) 保存期 出货后拆开包装最多保存三个月 (拆开包装后尽量使用我司包装封口保存或者真空 包装); 在未打开的塑料包装袋 (乙烯基) 内可保存六个月。
8.2	Matters needing attention 注意事项	(1) Deviation of striking part from the center axis of the switch shall be within 0.35mm . Allowable inclination of keying section : 90 ± 3 degrees or less. (2) Do not overload and shock the switch (3) Avoid pressing on the film with sharp objects (4) Cleaning after product welding is not allowed (5) Avoid switching on for a long time (1) 打击部件与开关中心轴的偏差应在 0.35mm 范围以内, 打击部件的允许倾斜度: 90 ± 3 度。 (2) 请不要对开关施加过量负荷和冲击 (3) 避免使用尖锐物体按压盖膜 (4) 不允许在产品焊接后进行清洗 (5) 避免开关长时间处于通路状态

