

NO.:20201207005

SPECIFICATION FOR APPROVAL

PART NAME: TACTILE SWITCH

MODEL NO: TS-06104 H=4.3mm(250gf)

DATE :Dec.07,2020

SAMPLE QUANTITY: 10PCS

APPROVED BY

Customer : AKIZUKI DENSHI TSUSHO CO., LTD

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**ISO 9001 & IATF 16949 Automotive Quality Management
System Certification Manufacturing Enterprise**

厦门金倍利电子有限公司 XIAMEN JINBEILI ELECTRONICS CO., LTD		文件编号 FILE NO.	页码 PAGE	1/6
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PRODUCT SPECIFICATION 产品承认书		文件版本 EDITION	第B版 第2次修订	
Title 名称	TACT SWITCH 轻触开关	产品料号 PART NO.	TS-06104 H=4.3mm 250GF	

1. General Characteristics 一般特性:

Applicating: This Specification is applied to rotary tact switch used for general application.

适用范围: 该承认书适用于轻触开关的一般使用范围.

Operating Temperature Range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

使用温度范围: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

1.3 Operating Relative Humidity: $\leq 85\% \text{ RH}$

相对湿度: $\leq 85\% \text{ RH}$

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, 测试大气条件如下:

Environment Temperature: $5 \sim 35^{\circ}\text{C}$

环境温度: $5 \sim 35^{\circ}\text{C}$

Relative Humidity: $45 \sim 85\%$

相对湿度: $45 \sim 85\%$

Atmospheric Pressure: $86 \sim 106\text{Kpa} (860 \sim 1060\text{mbar})$

大气压力: $86 \sim 106\text{Kpa} (860 \sim 1060\text{mbar})$

2. Appearance, structure and Dimensions 外观, 结构尺寸:

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

DC 12V 0.05A

4. Electrical Characteristics 电气特性

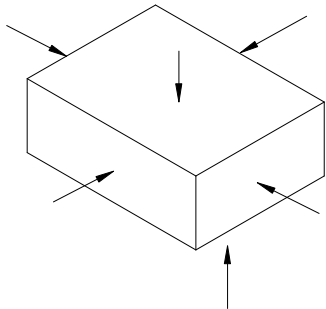
NO.	Item 项目	Criteria 标准	Test Method 实验方法
4.1	Contact Resistance 接触电阻	$100\text{m}\Omega \text{ Max}$	Measured by a voltage drop method at 1 mA Max, 5V DC. Any equipment with error not more than 5% can be used. Resistance after test in the average of 5 successive measurements (To measure after operated 5 to 10 times) 以 1mA, 5V 直流电, 采用电压降法测量。也可用误差不超过 5% 的仪表进行测量, 实验后的电阻取 5 次测量的平均值。(按动 5-10 次后测量)
4.2	Insulation Resistance 绝缘电阻	$100\text{M}\Omega \text{ Min}$	500V DC voltage is applied between each pair of terminals between the terminal and the metal frame for $60 \pm 5\text{S}$ 在相互绝缘的所有端子之间及各接线端子与外露的非载流金属零件之间加载 500V 直流电, 持续时间 $60 \pm 5\text{S}$
4.3	Dielectric Voltage 抗电强度	No dielectric breakdown shall occur 无击穿现象发生。	AC 250V ($50 \sim 60\text{Hz}$, cut-off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for $60 \pm 5\text{S}$ 在相互绝缘的所有接线端子之间及各接线端子与外壳或非载流金属零件之间加载 250V ($50 \sim 60\text{Hz}$) 交流电, 持续时间 $60 \pm 5\text{S}$

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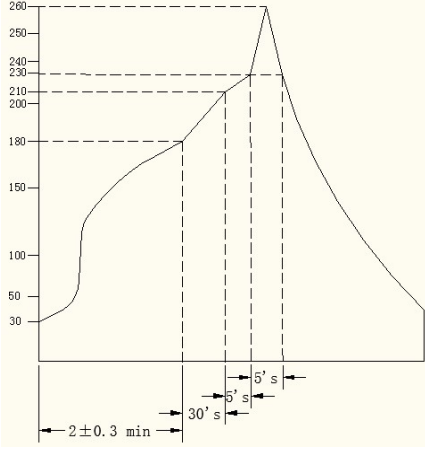
5.Mechanical Characteristics 机械特性

NO.	Item 项目	Criteria 标准							Test Method 实验方法
5.1	Operating Force 操作力	100gf±20gf	120gf±30gf	160gf±50gf	180gf±50gf	200gf±50gf	250gf±50gf	500gf±60gf	Apply a tension load on the midpoint of the actuator(or tip of the shaft)tk supply a pressure vertically from its free position to operating position. 在操作元件末端沿操作方向均匀施加静载荷,使操作元件从自由位置转换动作位置.
5.2	Return Force 回弹力	10gf Min	10gf Min	30gf Min	40gf Min	50gf Min	50gf Min	60gf Min	The value to whichthe force in the actuator midpoint(or tip of the shaft)must bk reduced to allow the contact to the normal position. 在操作元件末端沿操作方向均匀减少静载荷,使操作元件从动作位置转换自由位置.
5.3	Travel 行程								0.25mm±0.10mm
5.5	Terminal Strength 端子强度	Shall be free from terminal looseness, damage and insulator breakage No functional defectivr 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 3N shall be applied to the tip of terminals for 10s in any direcion 任意方向施加 3N 作用力于接线端末端, 持续时间 10s
5.6	Vibration Proof 振动	After test, Contact resistance:2Ω max. Insulation resistance:50MΩ Min. The electrical performance Specified in item 4.3-4.5 shall be satisfied. No abnormalities shall be recognized in appearance and construction 实验后: 接触电阻: 2Ω max. 绝缘电阻: 50MΩ Min. 电气性能应符合第 4.3-4.5 条的要求。 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 tested according to the following request: (1) Vibration frequency range=10~55Hz (2) Total amplitude =1.5mm (3) Sweep ratio:10~55~10HZ Approx. 1min (4) Method of changing the sweep vibration frequency:linear (5) Direction of vibration:Three perpendicular directions including actuating direction. 开关采用常规的安装方式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: 线性型式 (5) 振动方向: 三个相互垂直的方向, 其中一个方向是促动无件运动的方向。 (6) 时间: 每个方向 2 小时 (共 6 小时)

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5.7	Mechanical Shock 冲击	<p>After test</p> <p>Contact resistance: 2 Ω max.</p> <p>Insulation resistance: 50M Ω Min.</p> <p>The Electrical performance No functional defectivr occur.</p> <p>Shall be bree from mechanical abnormalities.</p> <p>实验后： 接触电阻：2 Ω max. 绝缘电阻：50MΩ Min. 无功能性不良。 表面无变形且操作无异常。</p>	<p>Switch shall be tested according to the following request:</p> <p>(1) Mounting Method:Normal</p> <p>(2) Acceleration: 490m/S² (50G)</p> <p>(3) Duration: 11ms</p> <p>(4) Test Direction:6 directions</p>  <p>(5) Number of shoks:3times per direction (18times in total)</p> <p>开关在下述参数条件下进行试验：</p> <p>(1) 安装方法：常规方法</p> <p>(2) 加速度：490m/S² (50G)</p> <p>(3) 时间：11ms</p> <p>(4) 实验方向：图示 6 方向</p> <p>(5) 每个方向 3 次（总共 18 次）</p>
5.8	Solder Ability 可焊性	<p>More than 80% of immersed part shall be covered with solder.</p> <p>超过 80%的浸锡面积被焊料所覆盖.</p>	<p>Switch shall be tesed according to the following request:</p> <p>(1)Equipment:Auto-Dip Chamber</p> <p>(2)Solder:Normal</p> <p>(3)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution.</p> <p>(4)Soldering Temperature:240±5℃</p> <p>(5)Immersing Time:3±0.5s</p> <p>(6) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p> <p>开关在下述参数条件下进行试验：</p> <p>(1)设备:自动焊接机</p> <p>(2)焊料:常规</p> <p>(3)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液</p> <p>(4)焊接温度: 240±5℃</p> <p>(5)浸渍时间: 3±0.5s</p> <p>(6) 浸渍深度:接线端应浸到离开开关根部 1.6mm 处.</p>

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5.9	Solder Heat Resistance 耐焊接热	<p>NO abnormalities shall be observed in appearance and operation 无外观及功能损坏</p> 	<p>Switch shall be tested according to the following request:</p> <ol style="list-style-type: none"> (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature & Immersing Time Dip soldering: 260±5°C 5±1s max Manual soldering: 350±5°C 2-3s (4)Immersion depth: (For Dip Soldering) immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) <p>开关在下列参数条件下进行试验:</p> <ol style="list-style-type: none"> (1)焊料:常规 (2)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液 (3)焊接温度及浸渍时间: 自动焊接: 260°C±5°C 5±1s 最大 手工焊接:350°C±5°C 2-3s (4)浸渍深度:(对于手动焊接) 接线端应浸到离开开关根部 1.6mm 处.
5.10	Resistance to Flux 抗焊剂能力	<p>Flux shall not be risen up tk 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.</p>	<p>Switch shall be tested according to the following request:</p> <ol style="list-style-type: none"> (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature:255±5°C Immersing Time:3±0.5s Flux immersing time shall be at 5-10s in normal room temperature. (4) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) <p>开关在下列参数条件下进行试验:</p> <ol style="list-style-type: none"> (1)焊料:常规 (2)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液 (3)焊接温度: 255±5°C 浸渍时间: 3±0.5s 焊剂浸渍时间:5-10s (4)浸渍深度:接线端应浸到离开开关根部 1.6mm 处.

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6. Durability characteristics			
NO	Ltem 项目	Criteria 标准	Test Method 实验方法
6.1	Mechanical life 机械寿命	After test, Contact resistance: 2 Ω max. Insulation resistance: 50M Ω Min. Tolerance of operating force Disintegration shall be within 30% of specified value No functional defrctive occur The switch shall be free from abnormalities in appearance Construction.	200,000 cycles of operation shall be performed continuously at a rate of 60 cycles per minute without load. 在不带负荷的条件下,速度为 60 次/分,在寿命试验设备上连续转换 200,000 次。
6.2	Electronics life 电气寿命	实验后: 接触电阻: 2 Ω max. 绝缘电阻: 50M Ω Min. 操作力衰变应在 Σ ± 30% 以内 无功能性不良 开关外观及结构应无损坏	200,000 cycles of operation shall be performed continuously at a rate of 60 cycles per minute load as follow 10mA 5V DC 在带 10mA 5V DC 负荷的条件下,速度为 60 次/分,在寿命试验设备上连续转换 200,000 次。

7. Weather Proof Characteristics 耐候性能:

7.1	Cold Proof 低温	After test, Contact resistance: 2 Ω max. Insulation resistance: 50M Ω Min. No functional defrctive occur The switch shall be free from abnormalities in appearance Construction.	After testing at -25 ± 2 °C for 48 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 -25 ± 2 °C 的温控箱内保持 48 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	实验后: 接触电阻: 2 Ω max. 绝缘电阻: 50M Ω Min. 无功能性不良 开关外观及结构应无损坏	After testing at 70 ± 2 °C for 48 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 70 ± 2 °C 的温控箱内保持 48 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		After testing at 40 ± 2 °C, 90 ~ 95% RH for 48 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 ± 2 °C, 90 ~ 95% RH 的温控箱内保持 48 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。

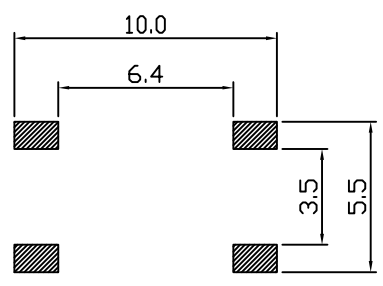
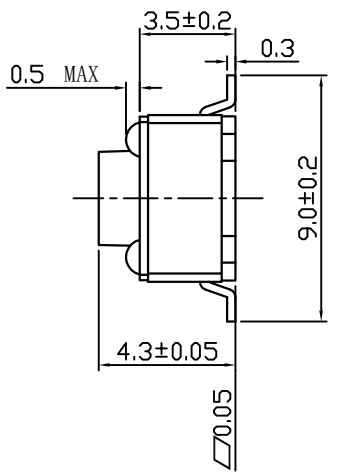
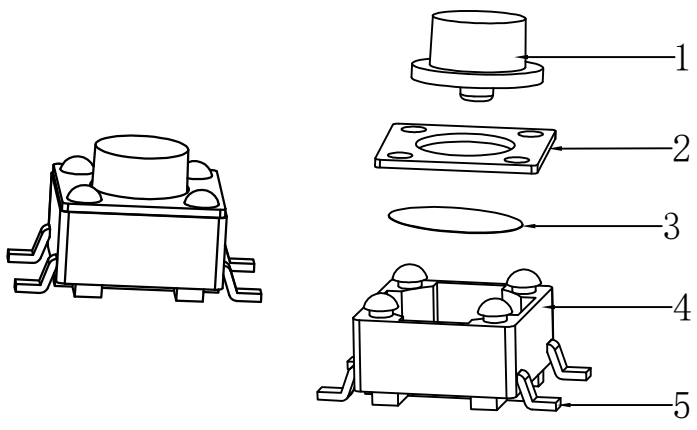
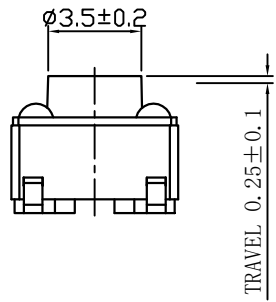
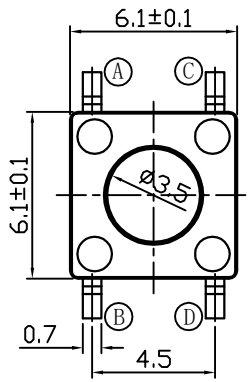
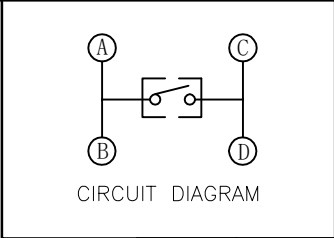
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7.4	Temperature Cycling 温度转换	After test, Contact resistance: 2Ω max. Insulation resistance: 50MΩ Min. No functional defrective occur The switch shall be free from abnormalities in appearance Construction. 实验后: 接触电阻: 2Ω max. 绝缘电阻: 50MΩ Min. 无功能性不良 开关外观及结构应无损坏	After 5 cycles of following conditions the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1hour after that.Water drops shall be eliminated. 试件按下述实验条件试验 5 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
7.5	Salt Mist 盐雾实验	No remarkable corrosion shall be recognized in metal part 在金属件上没有腐蚀斑点。	The switch shall be checked after the following test: (1) Temperature: 35±2°C (2) Salt Solution: 5±1%(Solids by mass), immersing time: 5minute. (3) After immersing, salt deposit shall be removed by runnig water. (4) Duration: 24 hours 试件在下述实验后测量: (1) 温度 35±2°C (2) 盐溶液浓度: 5±1%(质量百分比), 浸泡 5 分钟。 (3) 浸泡后的盐沉. 积物用水冲掉。 (4) 时间 24小时

编制: 郑显军
日期: 2020-12-07

审核: 杨文辉
日期: 2020-12-07

核准:
日期:



P. C. B LAYOUT

ELECTRICAL CHARACTERISTICS

1. RATING: DC 12V 0.05A
2. CONTACT RESISTANCE: 100mΩ MAX
3. INSULATION RESISTANCE: 100MΩ MIN
4. DIELECTRIC STRENGTH: AC 250V(50~60Hz)/60S

MECHANICAL CHARACTERISTICS

1. PRACTICAL TEMPERATURE RANG: -40℃ ~ +85℃
2. OPERATING FORCE: 70±25gf
 120±30gf
 180±50gf
 250±50gf
 300±50gf
3. MECHANICAL LIFE: 200,000 cycles

H(mm)	
4.3	✓
4.5	
5.0	
5.5	
6.0	
6.5	
7.0	
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18.0	

NO.	DESCRIPTION	MATERIAL	QTY	PLATING	TOLERANCE UNLESS SPECIFIED		ISSUE DATE		DESCRIPTIONS		APPD.
8					TOLERANCE UNLESS SPECIFIED						
7					TOLERANCE UNLESS SPECIFIED						
6					TOLERANCE UNLESS SPECIFIED						
5	TERMINAL	BRASS	4	Ag PLATED	WITHIN 1.5: ±0.1mm OVER 1.5: ±0.2mm ANGLES: ±2°		ISSUE	DATE	DESCRIPTIONS		APPD.
4	CASE	PPA	1	BLACK	TITLE:TACT SWITCH SERIES		UNIT:mm		DRWG. NO.:		
3	SPRING(CONTACT)	BRONZE	1	Ag COVERED	MODEL NO: TS-06104 H=4.3mm		SCALE:4:1		DWN		
2	COVER	BRASS	1	Ni PLATED	XIAMEN JINBEILI ELECTRONICS CO.,LTD				CHK'D		
1	BUTTON	PPA	1	BLACK					APPD.		