

APPROVAL SPECIFICATIONS

Title. PUSH SWITCH

Product Model. PB22M12101

Customer's Part NO.

Customer's Model:

Customer's Approval Requested.

Please return this copy as a certification of your approval.

Checked by: Date:

Approved by: Date:

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APPROVAL SPECIFICATIONS

Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		2/12

变更履历表:

版本	变更记录	变更人	变 更 日 期
A/01	民用规格升为车规级，更新规格书	林云龙	2020.03.20



Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		3/12

1、概述**GENERAL****1.1 适用范围****APPLICATION**

此规格书适用于机械式轻触开关的相关要求

This specification is applied to the requirements for tactile switch (mechanical contact)

1.2 工作温度范围**Operating Temperature Range**

-40°C~85°C(在标准大气压、标准湿度条件下)

-40°C~85°C(Normal humidity, normal air pressure)

1.3 贮藏温度范围**Storage Temperature Range**

-40°C~90°C(在标准大气压、标准湿度条件下)

-40°C~90°C(Normal humidity, normal air pressure)

1.4 测试条件**Test Conditions**

在没有其它特定的条件下, 应该在以下的条件下进行测试和测量:

Unless otherwise specified, tests and measurement shall be made in the following standard conditions:

常温.....5°C~35°C

Normal temperature.....5°C~35°C

标准湿度.....相对湿度 25%~85%

Normal humidity.....relative humidity 25%~85%

标准大气压.....86Kpa~106Kpa

Normal air pressure.....86Kpa~106Kpa

在制造过程中, 测试和测量应该在以下的条件下进行:

If any doubt arise from the judgment, tests shall be conducted at the following conditions:

温度.....20°C±2°C

Temperature.....20°C±2°C

相对湿度.....65%±5%

Relative humidity.....65%±5%

环境气压.....86Kpa~106Kpa

Air pressure.....86Kpa~106Kpa

1.5 存储方法**Storage method****1. 使用前确保包装完整无破损, 无浸湿.**

Ensure that the product without package breaking or wetting before use.

2. 存储条件 Storage conditions:

储存温度 Storage temperature: -5 ~ 35 C;

储存湿度 Storage humidity: 25% ~80%;

未开封状态: 6 个月内使用完毕 (从发货日开始计算); 超过 6 个月后再使用的, 使用前请先验证: 端脚无氧化、无发黑、塑料件无吸湿起泡, 确保焊接的适宜性;

Unopened status: Use up the product as soon as possible before 6 months. (calculated from shipment date). Over 6 months, please make sure below before use it: terminal without oxidation or blackening, plastic parts without moisture absorption or bubble, ensure solderability.

已开封状态: 1 个月内使用完毕;

Opened status: use up within 1 month;

储存注意事项: 避开高湿高温和有腐蚀性气体的环境及阳光直射;

Storage precautions: Please avoid the following environment: with high humidity, high temperature, corrosive gases and direct sunlight.

3. 请勿超重叠放.

Do not stack too many switches.



Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		4/12

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 接触形式：2P2T

FUNCTION : 2P2T

2.4 时间特性：NON-SHORTING

TIMING : NON-SHORTING

2.5 开关工作额定值：DC 14V 0.3A（最大值） DC 3V 50μA（最小值）

Ratings: DC 14V 0.3A（Max） DC 3V 50μA（Min）

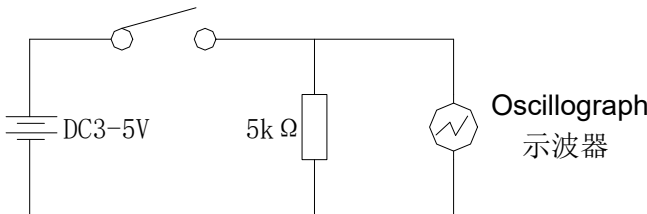
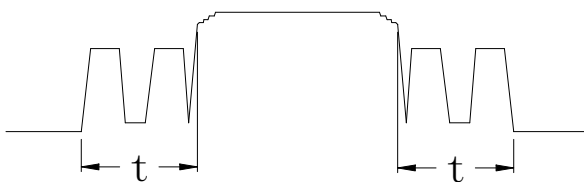
3. 电气性能：**ELECTRICAL SPECIFICATION**

项 目 ITEM		试 验 条 件 TEST CONDITIONS	要求 REQUIREMENTS
3.1	电压降 Voltage drop	负荷状态下开关操作 4~5 次 After several switching operations 4 to 5 times with Rating	端子间电压降为 0.1V Max
3.2	绝缘电阻 Insulation Resistance	输入 500V DC 电压 1 分钟，按以下接触方法测试： Apply a voltage of 500V DC shall be applied for 1 min. After which measurement be made: (1) 不接触的插脚之间 Between conductors not to be contact (2) 插脚与外壳之间 Between individual terminals and frame	≥100MΩ
3.3	介质耐压 Dielectric voltage proof	输入 AC 500V (50-60HZ)电压,1 分钟, Apply a voltage of 500V AC (50-60HZ) shall be applied for 1 min. 按以下接触方法测试： After which measurement be made: (1) 不接触的插脚之间 Between conductors not to be contact (2) 插脚与外壳之间 Between individual terminals and frame	无击穿、无飞弧 There should be no breakdown and flashover



GANGYUAN

APPROVAL SPECIFICATIONS

Product name		P/N	Version	Document No.	Page
Push switch		PB22M12101	A/01		5/12
项目 ITEM		试 验 条 件 TEST CONDITIONS			要求 REQUIREMENTS
3.4	触点抖动 Bounce	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 Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 times per second), and bounce shall be tested at “ON” and “OFF” Switch  DC3-5V 5kΩ Oscillograph 示波器  t 为触点抖动时间			ON-10ms max OFF-10ms max
4. 机械性能： MECHANICAL SPECIFICATION					
4.1	按力 Operating Force	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。 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.			3±1N
4.2	总行程 Full Travel	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，测量顶端移动的最大距离。 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.			2.3±0.5mm



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APPROVAL SPECIFICATIONS

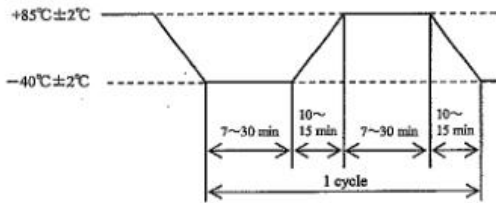
Product name		P/N	Version	Document No.	Page
Push switch		PB22M12101	A/01		6/12
项目 ITEM		试 验 条 件 TEST CONDITIONS			要求 REQUIREMENTS
4.3	锁定行程 LOCK Travel	开关处于锁定状态时与开关初始（断开状态）状态时的高度差，即为开关的锁定行程。 Placing the switch such that the direction of switch operation is vertical and then applying static load of 2times operating force to the center of the stem; the travel distance for the switch to come to a stop shall be measured.			1.5±0.3mm
4.4	操作部位强度 Operating part strength	在操作部位施加以下负载，时间 15 s。 Apply following load on the tip of of operating part 15 s. □ 操作方向 Operation direction ... 80N □ 引伸方向 Drawing direction ... 20N □ 操作方向的垂直方向 Right direction against operating direction ... 10N			开关无异常 No abnormal switch
4.5	操作柄摆动 Wobble in Lever	在操作柄的顶端施加最大 500 mN 操作力 When 500 mN force is applied to the tip of lever.			1.5 mm 以下. 1.5 mm max.
4.6	端子强度 Terminal Strength	在插脚前端任意一个方向加 5N 力度测试,时间为 10 秒 A static load of 500gf shall be applied to the Terminal for 15 Sec.in any direction.			端子没有裂开、松动（端子弯曲不在判定标准内） Without damage or excessive looseness of terminals （Terminal bending is not in the judgment standard）
4.7	锁紧强度 Locking Strength	在锁紧状态下对引伸方向施加 5N 的力 10 秒(本标准适用于开关锁紧机构) Apply force 5N to drawing direction for 10s at locking condition of switch. （This standard applies to switch lock mechanism.）			开关锁定功能正常。 No abnormalities shall occur in appearance and function.
4.8	耐落下冲击性 Drop Impact Strength	开关由 1 米的高度自由下落到测试板上（3cm 厚的橡木板），自由下落 10 次 After the switch is subjected do dropping 1 m height into a wooden Testing board(3 cm thick oak) 10 times;			电压下降 0.2V 以下 Voltage drop 0.2V max 绝缘电阻 250V DC,≥10MΩ Insulation Resistance 250V DC,≥10MΩ 介质耐压 250V AC,1 分钟 无击穿、无飞弧
4.9	振动 Vibration	根据以下给定条件进行测试： Measurement shall be made following the test set forth below: (1) 振动频率范围：10~55~10Hz Vibration frequency range: 10 to 55 to 10Hz (2) 振幅（峰—峰）：1.5mm Amplitude: 1.5mm (3) 振动方向：包括手柄行程方向在内的三个相互垂直的方向 Direction of vibration:Three mutually perpendicular direction including the direction of stem travel (4) 测试时间：每次 2 小时 Duration: Each 2 hours.			Dielectric voltage proof 250V AC,1min, there should be no breakdown and flashover 按力：初值的±30% Operating Force: initial value±30% 功能上，无有害变形、裂纹、缺口等 No harmful deformation , cracking and chip etc. , on function.



Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		7/12

5、环境耐久性：

ENVIRONMENTAL SPECIFICATION

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：96h Time: 96h	电压下降 0.2V 以下 Voltage drop 0.2V max 绝缘电阻 250V DC, ≥10MΩ Insulation Resistance 250V DC, ≥10MΩ 介质耐压 250V AC, 1 分钟 无击穿、无飞弧 Dielectric voltage proof 250V AC, 1min, there should be no breakdown and flashover 按力：初值的±30% Operating Force: initial value±30% 功能上，无有害变形、裂纹、缺口等 No harmful deformation, cracking and chip etc. , on function.
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℃ (2) 时间：96h time: 96h	
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. 	
5.4	湿温测试 Moisture 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：40±2℃ temperature: 40±2℃ (2) 相对湿度：90%~95% relative humidity: 90% to 95% (3) 时间：96h time: 96h	



Product name		P/N	Version	Document No.	Page
Push switch		PB22M12101	A/01		8/12
项目 ITEM		试 验 条 件 TEST CONDITIONS			要求 REQUIREMENTS
5.5	硫化试验 Sulfuration 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) H₂S 气体浓度: 3ppm±1ppm H₂S gas concentration: 3ppm±1ppm (2) 时间: 96h Time: 96h (3) 温度: 40±2°C (90~95%RH) temperature: 40±2°C (90~95%RH)			电压下降 0.2V 以下 Voltage drop 0.2V max 绝缘电阻 250V DC, ≥10MΩ Insulation Resistance 250V DC, ≥10MΩ 介质耐压 250V AC, 1 分钟 无击穿、无飞弧 Dielectric voltage proof 250V AC, 1min, there should be no breakdown and flashover 按力: 初值的±30% Operating Force: initial value±30% 功能上, 无有害变形、裂纹、缺口等 No harmful deformation, cracking and chip etc., on function.
5.6	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°C±2°C temperature: 35°C±2°C (2) 盐溶液浓度: 5±1% (质量百分比) salt solution: 5±1% (solids by mass) (3) 时间: 8±1h Time: 8±1h 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.
5.7	可焊性 Solderability	在以下设定条件下进行测量: Measurements shall be made following the test set forth below: (1) 焊接温度: 255±5°C Solder temperature: 255±5°C (2) 浸入时间: 3s±0.5s Immersion time: 3s±0.5			除边缘外涂层应均匀覆盖 90%以上 Except for the edge, the coating should cover a minimum 90%

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APPROVAL SPECIFICATIONS

Product name		P/N	Version	Document No.	Page
Push switch		PB22M12101	A/01		9/12
项目 ITEM		试 验 条 件 TEST CONDITIONS			要求 REQUIREMENTS
5.8	动作寿命 Operation life	(1) No loaded test 无负荷试验 After 15,000 cycles operating with no load. (15~20 operations per minute.) 无负载下循环运行操作 15 000 次（频率 15~20 次/分）。			电压下降 0.2V 以下 Voltage drop 0.5V max 绝缘电阻 250V DC,≥10MΩ Insulation Resistance 250V DC,≥10MΩ 介质耐压 250V AC,1 分钟 无击穿、无飞弧 Dielectric voltage proof 250V AC,1min, there should be no breakdown and flashover 按力：初值的±30% Operating Force: initial value±30% 功能上无有害变形、裂纹等 No harmful deformation, cracking and chip etc, on function.
		(2) Loaded test 有负荷试验 After 15,000 cycles operating with rated load DC5V,0.5A . (15~20 operations per minute.) 负载下循环运行操作 15 000 次（频率 15~20 次/分）。			电压下降 0.5V 以下 Voltage drop 0.5V max 绝缘电阻 250V DC,≥10MΩ Insulation Resistance 250V DC,≥10MΩ 介质耐压 250V AC,1 分钟 无击穿、无飞弧 Dielectric voltage proof 250V AC,1min, there should be no breakdown and flashover 按力：初值的±30% Operating Force: initial value±30% 功能上无有害变形、裂纹等 No harmful deformation, cracking and chip etc, on function.
6. 焊接条件： SOLDERING CONDITIONS:					
6.1	手工焊接 Hand soldering	请按以下条件进行焊接： (1) 焊锡温度：≤350℃ (2) 连续焊接时间：≤3 s Please practice according to below conditions: (1) Soldering temperature: ≤350℃ (2) Continuous soldering time: ≤3 s			



GANGYUAN

APPROVAL SPECIFICATIONS

Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		10/12

项目 ITEM		推荐条件 Recommended conditions
6.2	回流焊时 Conditions for reflow	对于 SMT 产品, 请按以下条件进行焊接: For SMT products, Pls soldering by follow conditions: 注意: 以上提及的条件是零部件上 PWB 表面的温度, 由于 PWB 的材料、尺寸、厚度等不同, PWB 从开关表面获得的温度也会有很大不同, 因此, 千万小心不要让开关表面温度超过 260°C Attention: the condition above is the temperature of the PWB surface on the parts, and PWB will get different temperature because of the differences of materials, sizes, thickness and so on. Should control it below 260°C

注意事项(Notes):

- a、印刷基板的焊盘尺寸参见产品图。

The pad size of the printed substrate is shown in the product diagram.

- b、在使用烙铁的情况下, 焊锡温度应在 350°C 以下、3 秒以内。

In the case of using soldering iron, soldering conditions shall be 350°C max and 3 sec. max.

- c、防止助焊剂从开关的顶端渗入

Prevent flux penetration from the top of the switch

- d、开关浸焊后, 注意不要用溶剂或类似品清洗开关。

After switches were soldered, please be careful not to clean switches with solvent or other similar products.

- e、浸焊后, 注意不要在顶部施加负荷。

Right after switches were soldered; please be careful not to load to on the knobs of switches.

- f、注意不要施加超负荷的压力或晃动开关。

Please be cautions not to give excessive static load or shock to switches.

- g、开关浸焊后, 印刷基板注意不要叠放。

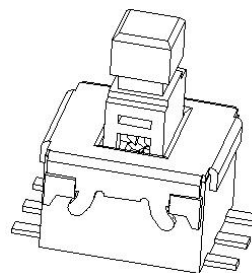
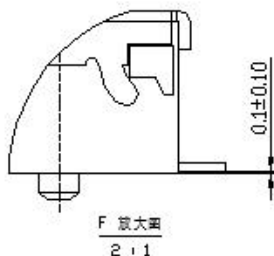
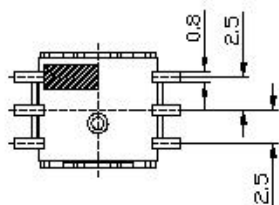
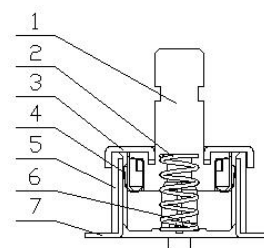
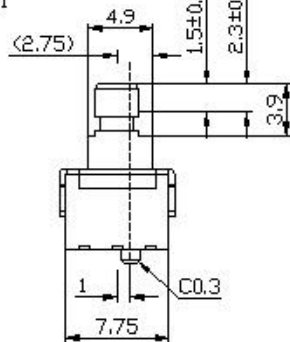
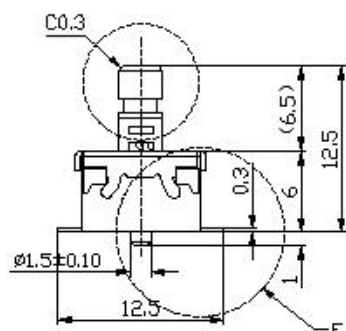
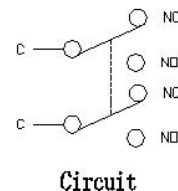
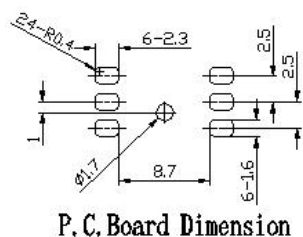
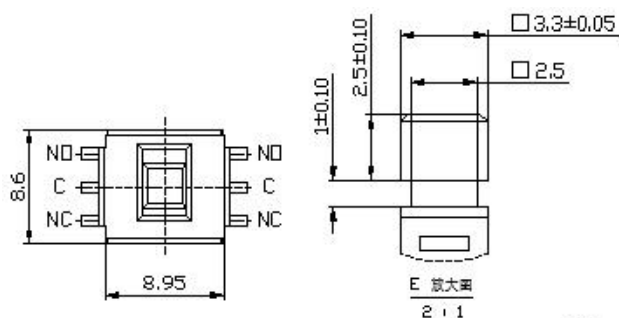
Please be careful not to pile up P.W.B. after switches were soldered



GANGYUAN

APPROVAL SPECIFICATIONS

Product name	P/N	Version	Document No.	Page
Push switch	PB22M12101	A/01		11/12

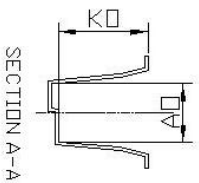
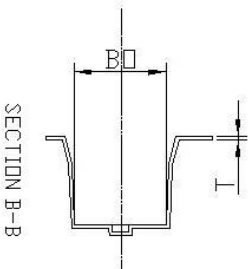
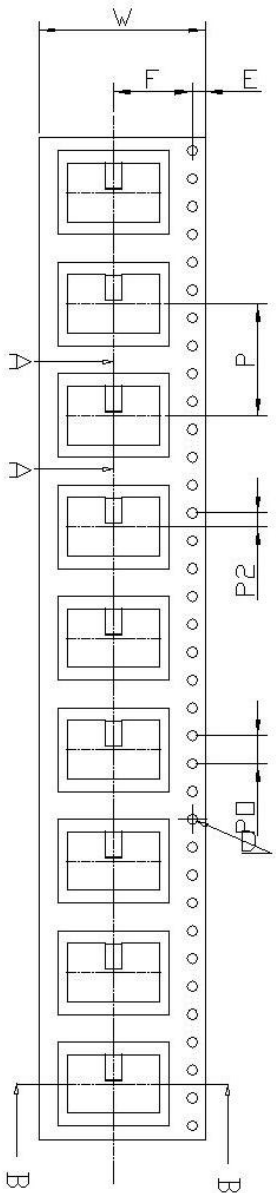
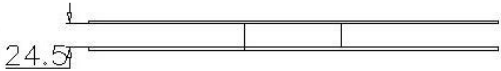
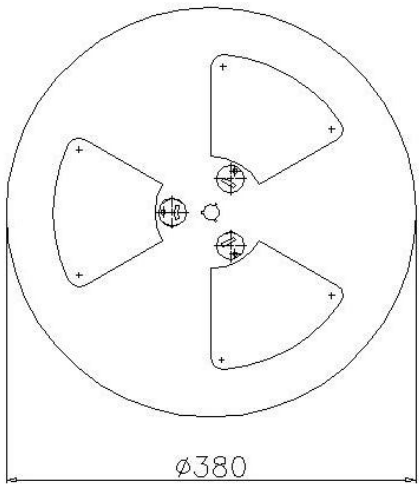


General tolerance: ±0.2mm

NO.	NAME	MATERIAL	QTY.	FINISHING
1	KNOB	PA	1	Black
2	SPRING	SUS	1	Natural
3	COVER	SPTE	1	Natural
4	CONTACT	PBS	2	Ag Plated
5	CASE	PA	1	Black
6	Stoper	SUS	1	Natural
7	TERMINAL	BRASS	6	Ag Plated
8	BLOCK	PBS	1	Natural



ITRM	W	AD	BD	KD	P	F	E	D	PD	P2	T	13'
DIM	24	8.4	13.1	12.8	16	11.3	1.95	1.5	4	2	0.5	包装数
TOL	±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	1.5*0.1	±0.1	±0.1	±0.05	400PCS



1. 成品包装数量每盘400只.
2. 载带编好后前空300mm左右, 后空(包装后盘内固定端面) 200-300mm左右.
3. 载带颜色为黑色.

PB22M12载带				温州港源电子有限公司			
设计	更改文件号	签字	日期	材料	PS	HRC	重量比例
绘图		会		图样标记			
批准		审					
日期				共 1 页	第 1 页		