



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: TAM15-J-R

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

贵公司承认印 Approval signatures

Approval/Date	Remark

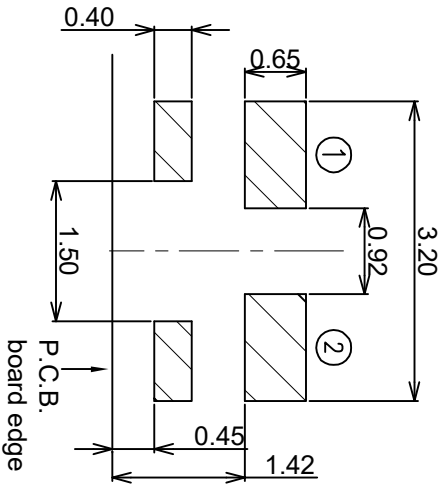
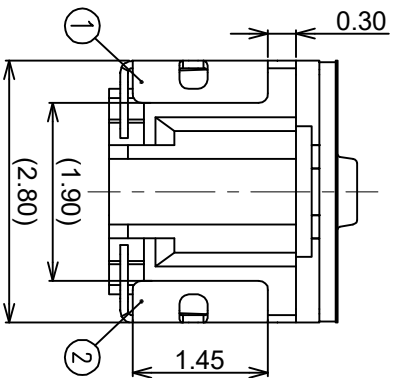
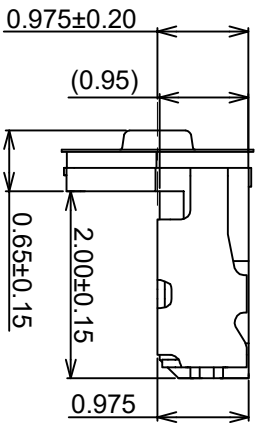
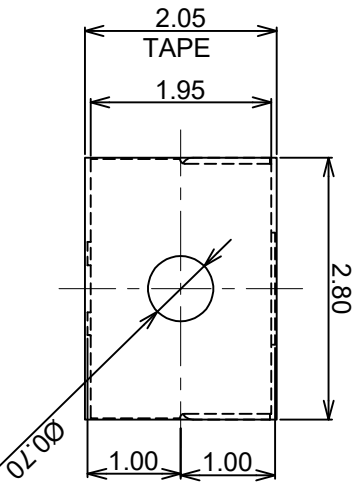
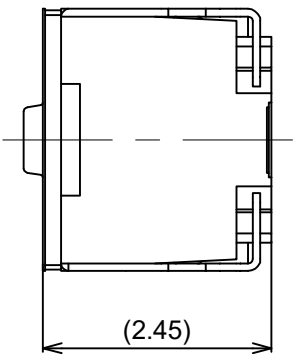
Send us a copy of reference , thank you!

日期 Date:2022.9.21

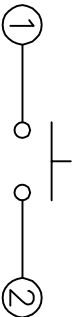
地址: 广东省东莞市长安镇沙头社区猫山东路 101 号

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

Ntel: 0769-81581583



P.C.B. Layout (Tolerances ±0.05mm)



Circuit Diagram

G-Switch Specification:
 OPERATING FORCE: 160±50gf
 Travel: 0.13±0.05mm
 Operating temperature range: -40°C to +85°C
 Rating: 50mA, 12V DC
 Insulation resistance: 100MΩ min, 100V DC
 Dielectric strength: 250V AC for 1 min
 Contact resistance: 100mΩ max.
 LIFE: 300,000 cycles



东莞市铭标电子科技有限公司
 Ming Mark Electronic Technology Co., Ltd.

ROHS

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

Unless otherwise specified, Tolerance:
 ±0.30
 ±0.20
 ±0.15
 ±0.10
 ±.3
 X, X.X
 X.XX
 X.XXX
 X.XXX
 Angles

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED

DATE

APPROVED

DATE

TAM15-JR

REV.: X1

SCALE: 4:1

UNIT: mm

SIZE: A4

SHEET: 1/1

DESIGN Done

DATE 2022.09.20

Mold code:

CHECKED



SPECIFICATION

Page	2/8
Version	A/0
Date	2017. 8. 3

MODEL

TAM15-J-R

1. General(一般事项):

1.1 Operating Temperature Range (使用之温度范围):-40°C ~ +85°C

1.2 Storage Temperature Range(储存之温度范围): -40°C ~ +85°C

1.3 Test conditions(测试状态)

Unless otherwise specified, the test and measurements shall be carried out as follows.

除非另有说明, 测试与测量应如下条件进行.

Ambient temperature(环境温度) : 5~35 °C

Relative humidity(相对湿度) : 45~85 %

Air pressure(气压) : 86~106 kPa

However, if doubt arises on the decision based on the measured values under the above-mentioned conditions, the following conditions shall be employed.

无论如何, 如果上述条件量测时有疑虑时, 应在下列条件使用

Ambient temperature(环境温度) : 20± 2°C

Relative humidity(相对湿度) : 65±5 %

Air pressure(气压) : 86~106 kPa

2. Rating(额定负载):

10uA, 2V DC (MIN.) / 20mA, 15V DC (MAX.)

3. Type of Actuation: Tactile feedback.(类型: 触动回复式)

4. Test Sequence(测试项目) :

二、

特性	项次	测试种类	测试条件	测试要求
外观 Appearance	1	Visual Examination 目视检查	By visual examination check without any out pressure & testing. 在未施加任何外力及试验前,以目视方式检测	By visual examination check without any out pressure & testing. 在未施加任何外力及试验前,以目视方式检测
电气特性 Electrical Performance	2	Contact Resistance 接触阻抗	Applying a static load 1.5-2 times the operating force to the center of the stem, measurements shall be made with a 1 kHz small current contact resistance meter 用一作动力 1.5-2 倍力量的静态荷重, 实际按压触钮 的中央处,并 1KHZ 规格的微电流阻抗计测量接触阻抗值	500mΩ Max. (initial)
	3	Insulation Resistance 绝缘阻抗	100V DC, 1 minute ± 5 sec. 直流电压 100V, 1 分钟±5 秒	50MΩ Min.



SPECIFICATION

Page

3/8

Vers
ion

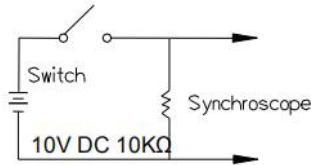
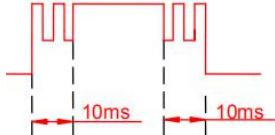

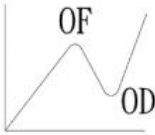
A/0

MODEL

TAM15-J-R

Date

2017. 8. 3

<p>电气特性 Electrical Performance</p>	<p>4</p>	<p>withstand Voltage 耐电压</p>	<p>250V AC (50Hz or 60 Hz 2mA) shall be applied between all the adjacent terminals and between the terminal and the frame for 1 minute. 以 250V 的交流电 50HZ 或 60HZ 2MA,施于两相邻端子与底座间,并保持 1 分钟之加压状态后,检查是否能耐该值</p>	<p>No dielectric breakdown shall be occurred 成品不得有故障,跳火及绝缘体破坏等不良现象</p>
<p>机械特性 Mechanical Performance</p>	<p>5</p>	<p>Bounce 弹跳</p>	<p>3 to 4 operations at a rate of 1 cycles per second 每秒 3~4 次的速度为一循环,观察示波器上之显示</p> 	<p>10 m seconds Max. 不得高于 10 毫秒</p> 
	<p>6</p>	<p>Operation Force 作动力</p>	<p>Applied in the direction of operation. 测定触钮操作方向之力量</p> 	<p>160±50gf</p>
	<p>7</p>	<p>Stroke 作动量</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 to a stop shall be measured 将成品放置定位后,以一垂直力慢慢施压在按钮的中央处,使按钮从开始按压到无法按压停止,测量实际按压过程的距离</p>	<p>0.13±0.10mm</p>
	<p>8</p>	<p>Click</p>	<p>Click=(OF-OD)/OF×100%</p> 	<p>30% MIN. (before reflow soldering)</p>
	<p>9</p>	<p>Control strength 操作部强度</p>	<p>The static load of 5kg shall be applied in the operating direction of the control unit for 15 seconds. 以 5KG 的静态荷重施于推钮上方,操作时间 15 秒</p>	<p>As shown in item 2~6 受测后之成品仍需合述 4~7 测试项规格之要求</p>



SPECIFICATION

Page

4/8

Version

A/0

MODEL

TAM15-J-R

Date

2017. 8. 3

机械特性 Mechanical Performance	10	Solder Heat Resistance 抗錫锡热	SMT Type ~T1C Series(5/7)	1) Shall be free from pronounced backlash and falling-off or breakage terminals 2) As shown in item 2~5 1) 浸錫后, 端子不得有明显的焦黑镀层剥落或断裂现象 2) 受测后的成品仍需符合前述 2-5 测试项规格的要求
耐久性 Durability	11	Life Test 寿命测试	Measurements shall be made following the test forth below: 1) 20mA, 15 V DC resistive load 2) Rate of Operation: 2~3 operation per second 3) Applying a static load the operating force to the center of the stem in the direction of operation 4) Cycle of Operation: 300,000 次 测试时需按照下列所设定之情况: 1) 施以 5MA, 5VDC 之直流电 2) 测定速度: 2-3 次/秒 3) 测定时需于开关操作方向以 0F 限之静态荷重施于按钮中央处 4) 受测次数: 300,000 次	1) As shown in item 4、5 2) Operating force: $\pm 30\%$ of initial force 3) Contact Resistance: 20 Ω Max. 4) Insulation Resistance: 10M Ω Min. 5) Bounce: 30 m seconds Max. 1) 受测后的成品仍需符合 4、5 测试项规格的要求 2) 测试后, 作动力之变化需为初始值 $\pm 30\%$ 3) 测试后的接触阻抗值不得高于 20 Ω 4) 受测后的绝缘阻抗值不得低 10M Ω 5) 受测后的回弹反应时间须于 30 秒内
耐候性 Environmental Endurance	12	Vibration 振动测试	Shall be vibrated in accordance with Method 201A of MIL-STD-202F 1) Swing distance=1.5mm 2) Frequency: 10-55-10 Hz 1 minute/cycle. 3) Direction: 3 vertical directions including the direction of operation. 4) Test Time: 2 hours each direction. 请依照 MIL-STD-202F, 201A 所规定之方法做测试 1) 振幅=1.5mm 2) 频率: 10-55-10HZ 的频率循环测试, 周期 1 分钟 3) 振动方向: 以 X, Y, Z 三轴向, 包含推钮操作之方向 4) 测试时间: 每一方向 2 小时	As shown in item 2~6 受测后之成品仍需符合前述 2-6 测试项规格的要求



SPECIFICATION

Page

5/8

Version

A/0

MODEL

TAM15-J-R

Date

2017. 8. 3

耐候性 Environmental Endurance

13	Cold Resistance 耐寒性	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1) Temperature : $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$. 2)Time: 500 hours. 请依照下列所设定的条件测试后,并于常温常湿中放置 1 小时后测定 1) 受测温度: $-40\pm 2^{\circ}\text{C}$ 2) 受测时间:500 小时	As shown in item 2~6 受测后之成品仍需合述 2-6 测试项规格之要求
14	Heat Resistance 耐热性	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1)Temperature : $85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 2)Time: 500 hours 请依照下列所设定的条件测试后,并于常温常湿中放置 1 小时后测定 1) 受测温度: $85\pm 2^{\circ}\text{C}$ 2) 受测时间:500 小时	Ditto 同上
15	Humidity Resistance 耐湿性	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1)Temperature : $60^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 2)Relative Humidity :90~95% 3)Time: 500 hour 请依照下列所设定的条件测试后,于常温常湿中放置 1 小时后测定 1) 受测温度: $60\pm 2^{\circ}\text{C}$ 2) 相对湿度:90-95% 3) 受测时间:500 小时	1)Contact Resistance: 1 Ω Max 2)Insulation Resistance: 10M Ω Min 3)As shown in item 4~6 1) 测试后的接触阻抗值不得高于 1 Ω 2) 受测后的绝缘阻抗值不得低于 10M Ω 3) 受测后的成品仍需符合 4-6 测试项规格的要求



SPECIFICATION

Page

6/8

Version

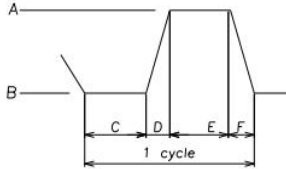
A/0

MODEL

TAM15-J-R

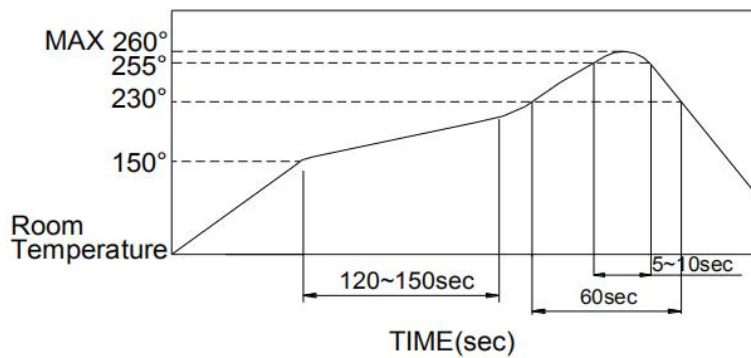
Date

2017. 8. 3

<p>耐候性 Environmental Endurance</p>	<p>16</p>	<p>Change of temperature 温度循环</p>	<p>After 5 cycles of following conditions, the switch shall be allowed to stand under normal room temperature and humidity conditions for 1 hr, and measurement shall be made within, 1 hr after that. Water drops shall be removed.</p> <p>1) 测试周期: 20 个循环 2) 标准条件试验后: 1 小时 3) 1 个循环:</p>  <p>A= +85 °C B= -40 °C C= 1 H D= 5 min E= 1 H F= 5 min</p>	<p>As shown in item 2~6 受测后之成品仍需合述 2-6 测试项规格之要求</p>
--	-----------	---------------------------------------	--	---

六、Soldering Conditions(焊锡条件):

*SMT 系列



■ The condition mentioned above is the temperature on the Cu foil of the P.C.B surface.

There are cases where board' s temperature greatly differs from switches surface temperature depending on board' s material, size, thickness, etc. Care, therefore, should be used not to allow switch' s surface temperature to exceed 260°C

上述提到的情况,是 PCB 上铜箔之温度。有一些情形是这 PCB 的温度和开关表面之温度会有很大的不同,这和 PCB 材质.大小.厚度等有很大的关系,因此要小心不要让开关表面的温度超过 260°C



SPECIFICATION

Page 7/8

Version A/0

MODEL

TAM15-J-R

Date

2017. 8. 3

Manual Soldering(手工焊锡)

Soldering Temperature(焊锡温度)

Max.350°C

Soldering Temperature(焊锡温度)

Max.350°C

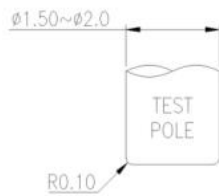
■ Precautions in Handling(处理时注意事项):

1. Care should be exercised so that flux from the upper part of the printed circuit board does not adhere to the switch.

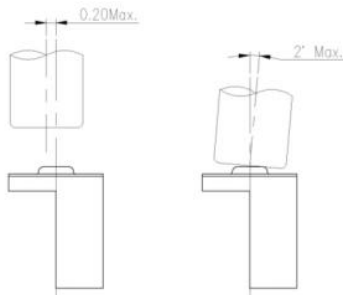
在 P. C. B 板面上之助焊剂，不要黏到开关本身

2. Prohibited items and notes on mounting and operating conditions(使用开关须注意事项):

2.1 Recommended shape of test pole(建议之测头形状大小)



3.2 Recommended operating conditions(建议之操作条件)





SPECIFICATION

Page

8/8

Version

A/0

MODEL

TAM15-J-R

Date

2017.8.3

■Notes on storage conditions(储存条件的注意事项):

Do not store in the following environment or it may affect product's function and solderability:

当物品被储存于以下的情形与条件它可能会影响产品功能变差及吃锡性等..

应避免储存于下列情形

1.temperature of -10 (max)、 +40 (min) °C & humidity at 85% (min)

摄氏温度低于-10 °C或高于 40°C，且湿度高于 85%之环境

2.environment with corrosive gas

空气中含有腐蚀性气体

3.storage over 6 months

长期储存超过六个月

4.place of direct sunlight

阳光直接照射的地方

*Store with proper packaging conditions and to avoid loading heavy force.

储存时保持包装完整，以免外应力施加于产品

*We suggest to use the products within 3 months or at least 6 months.

收到产品后请尽快使用，建议三个月内使用完毕，若须存放请勿超过六个月

*After opening the package, the rest products must be stored in the appropriate moisture-proof & airtight environment

剩余产品若已开封，请将产品储存于防潮、密闭的环境中