

东莞市韩源电子有限公司

SAMPLE APPROVAL SHEET 样品承认书

Client Name 客户: _____

Client P/N 客户料号: _____

Shi Hao P/N 韩源料号 : CPG151101D13

Article 品名规格: 青轴开关/端子接触面镀镍/不带固定脚

Remark 备注: _____

SUPPLIER APPROVAL 供应商确认:

制作 (Edited by)	审核 (Checked by)	核准 (Approved by)	送样日期 (Deliver date)

CUSTOMER APPROVAL 客户承认:

承认 (Tested by)	审核 (Checked by)	核准 (Approved by)	承认日期 (Accept date)

地址：东莞市黄江镇田美社区福利一街4号二楼

东莞市韩源电子有限公司 HANYONES ELECTRONICS CO.,LTD

1. General specification 基本事项

1.1 Switch action 开关种类 Push-on type S. P. S. T: 按键开关

1.2 Switch rating 额定值 : 12V AC/DC max. 2V DC min. 10mA AC/DC max. 10μA DC min.

1.3 Operation temperature range 使用温度试验范围 : - 40 ~ + 70°C

1.4 Storage temperature range 保存温度范围 : - 40 ~ + 70°C

1.5 Suggested storage period 贮存期限 : about 6 months 最多六个月

Require the tin part on the switch terminals should keep good after storage guarantee date

要求贮存期后开关端子部分上锡仍然良好

1.6 Appearance and dimensions 外形及尺寸: See outside drawing page 见外形尺寸图

1.7 Dust-proof waterproof level switch 开关防尘防水等级为: IP 40

1.8 Standard condition Unless otherwise specified, the test and measurements shall be carried out as follows:

标准状态 除非另有说明, 试验和测量应如下进行

Ambient temperature 温度 : 10°C~30°C

Relative humidity 相对湿度 : 45 ~ 85

Air pressure 气压 : 86 ~ 106kPa (860~1060mbar)

However, if doubt arises on the decision based on the measured

Values under the above-mentioned conditions, the following conditions shall be employed:

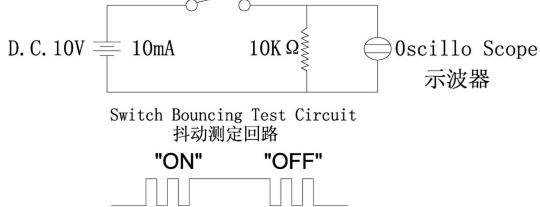
但是在对判定产生疑义时, 按下述状态实施:

Ambient temperature 温度: 20±2°C Relative humidity 相对湿度: 90±5%

Air pressure 气压: 86 ~ 106kPa (860~1060mbar)

2. Performance 性能

2.1 Electrical characteristics 电气性能

No.	Item 项目	Test condition 试验条件	Performance 规格
2.1.1	Contact resistance 接触电阻	Push force: (Operation force) x 2。 测定时的负荷: 操作方向动作力基准值的2倍。 Measurement tool : Contact resistance meter 测定器: 微电流接触电阻计(1kHz, 20mV, 5~50mA)	Initial contact resistance(初始值) 200mΩ Max After Environmental Test (环境测试后) 500mΩ Max After Life Test(寿命测试后) : 2Ω Max
2.1.2	Insulation resistance 绝缘电阻	DC. 100V(Between terminals) (端子间)	100MΩ min 100MΩ 以上
2.1.3	Withstand voltage 耐电压	AC 500V for 1 min (Between terminals) (端子间)	No insulation destruction. 无绝缘破坏.
2.1.4	Bouncing 触点抖动	Operation speed : 3~4 times/s 操作速度: 每秒3~4 次 Oscilloscope 示波器 Switch Bouncing Test Circuit 抖动测定回路 	ON: 5ms max 以下 OFF: 5ms max 以下

东莞市韩源电子有限公司
HANYONES ELECTRONICS CO.,LTD

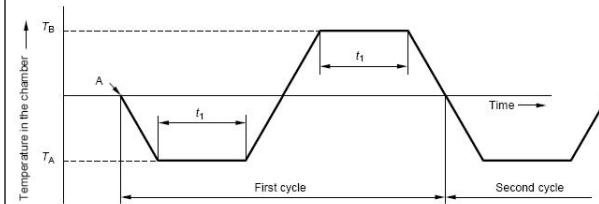
2.2 Mechanical Characteristics 机械性能

No.	Item 项目	Test condition 试验条件	Performance 规格																																								
2.2.1	Operation force 操作力 Travel to closure 动作行程 (见图表)	<p style="text-align: center;">Force-Travel-diagram 操作力-行程-图解</p> <table border="1"> <caption>Data points estimated from Force-Travel-diagram</caption> <thead> <tr> <th>travel (mm)</th> <th>pressure point (gf)</th> <th>operating point (gf)</th> <th>reset point (gf)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>30</td><td>20</td><td>20</td></tr> <tr><td>0.5</td><td>60</td><td>40</td><td>20</td></tr> <tr><td>1.0</td><td>80</td><td>40</td><td>20</td></tr> <tr><td>1.5</td><td>60</td><td>40</td><td>20</td></tr> <tr><td>2.0</td><td>40</td><td>60</td><td>20</td></tr> <tr><td>2.5</td><td>40</td><td>60</td><td>20</td></tr> <tr><td>3.0</td><td>50</td><td>60</td><td>20</td></tr> <tr><td>3.5</td><td>60</td><td>60</td><td>20</td></tr> <tr><td>4.0</td><td>70</td><td>60</td><td>20</td></tr> </tbody> </table>	travel (mm)	pressure point (gf)	operating point (gf)	reset point (gf)	0.0	30	20	20	0.5	60	40	20	1.0	80	40	20	1.5	60	40	20	2.0	40	60	20	2.5	40	60	20	3.0	50	60	20	3.5	60	60	20	4.0	70	60	20	<p>Operating force 操作力 : 50 ± 10gf</p> <p>End force 终点力: 60 ± 10f</p> <p>Conduction stroke 导通行程: 2.2 ± 0.5mm</p> <p>Total Travel 总行程: 4.0 ± 0.4mm</p>
travel (mm)	pressure point (gf)	operating point (gf)	reset point (gf)																																								
0.0	30	20	20																																								
0.5	60	40	20																																								
1.0	80	40	20																																								
1.5	60	40	20																																								
2.0	40	60	20																																								
2.5	40	60	20																																								
3.0	50	60	20																																								
3.5	60	60	20																																								
4.0	70	60	20																																								
2.2.2	Push strength 按压强度	<p>5Kgf for 15 sec 5Kgf 15秒</p>	<p>No damage (Electrical and mechanical) 无异常 (电气、机械性能)</p>																																								
2.2.3	Pull strength 推压强度	<p>Break by drawing push plate in the direction of right diagram 抽拔推杆使其破坏的强度.</p>	4kgf																																								
2.2.4	Vibration test 耐振性	<p>1) Amplitude 全振幅: 1.5 mm 2) Sweep rate: 10–55–10Hz for 1 minute 扫描速度: 10–55–10Hz 1 分钟 3) Sweep method: Logarithmic frequency sweep rate 扫描方式: 对数频率扫描速度 4) Vibration direction : X, Y, Z(3 directions) 振动方向: X, Y, Z (3 方向) 5) Time : Each direction 2 hours (Total 6 hours) 时间: 每个方向2个小时(共6个小时)</p>	<p>No. 2.1 and 2.2.1 to 2.2.2 shall be satisfied 满足2.1项和2.2.1至2.2.2项.</p>																																								
2.2.5	Shock 耐冲击性	<p>Measure after test at a condition below 在下列条件下进行测试后的量度 Peak acceleration:80G 冲击加速度:80G Test time=6direction , each 3 times total 18times 测试次数=6个方向, 各3次共计18次。</p>	<p>No. 2.1 and 2.2.1 to 2.2.2 shall be satisfied 第2.1及2.2.1—2.2.2都应符合要求</p>																																								
2.2.6	Endurance (switching action) 耐久特性 (开关寿命)	<p>1) D.C. 12V 10mA resistance load D.C 12V 10mA 电阻负荷 2) Operation speed : 2–3 times / s 动作速度: 2–3 次/秒 3) Push force : 150gf 按力:150gf 4) Push travel : 4.0mm(Max) 按压行程: 4.0mm(最大) 5) Operation number:50,000,000cycles 动作次数:50,000,000次</p>	<p>Contact resistance 2Ωmax 接触电阻 2Ω以下 Bouncing: 10 ms max 触点抖动: 10 毫秒以下 Variation rate of operation force shall be within $\pm 30\%$ to the value before testing 动作力的变化范围在初始值的$\pm 30\%$以内 No. 2.1.2 and 2.2.2 shall be satisfied 满足2.1.2 和2.2.2 项</p>																																								

东莞市韩源电子有限公司
HANYONES ELECTRONICS CO.,LTD

2.3 Climatic characteristics 耐候性能

No.	Item 项目	Test condition 试验条件	Performance 规格
2.3.1	Cold test 耐寒性	1) Temperature : $-40 \pm 2^\circ\text{C}$ 温度: $-40 \pm 2^\circ\text{C}$ 2) Duration of test: 96h 持续时间: 96 小时 3) Take off a drop water 去掉水珠 4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance $200\text{m}\Omega$ max No. 2.1.2 to 2.1.4 and No. 2.2.1 to 2.2.2 shall Be satisfied 接触电阻 $200\text{m}\Omega$ 以下 满足2.1.2 到2.1.4 项、2.2.1 到2.2.2 项.
2.3.2	Heat test 耐热性	1) Temperature : $70 \pm 2^\circ\text{C}$ 温度: $70 \pm 2^\circ\text{C}$ 2) Duration of test: 96h 持续时间: 96 小时 3) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance $200\text{m}\Omega$ max No. 2.1.2 to 2.1.4 and No. 2.2.1 to 2.2.2 shall Be satisfied 接触电阻 $200\text{m}\Omega$ 以下 满足2.1.2 到2.1.4 项、2.2.1 到2.2.2 项.
2.3.3	Temperature cycle 温度循环	1) Test cycles : 2 cycles 试验周期: 2 个周期 2) Cycle time: 8H 循环总时间: 8小时 3) Parameter: TA: -40°C TB: 70°C t1=3H 参数: TA: -40°C TB: 70°C t1=3H 4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance $200\text{m}\Omega$ max No. 2.1.2 to 2.1.4 and No. 2.2.1 to 2.2.2 shall be satisfied 接触电阻 $200\text{m}\Omega$ 以下 满足2.1.2 到2.1.4 项、2.2.1 到2.2.2 项.
2.3.4	Humidity test 耐湿性	1) Temperature : $70 \pm 2^\circ\text{C}$ 温度: $70 \pm 2^\circ\text{C}$ 2) relative humidity: 90~95% 相对湿度: 90~95% 3) Duration of test: 96h 持续时间: 96 小时 3) Take off a drop water 去掉水珠 5) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance $200\text{m}\Omega$ max No. 2.1.2 to 2.1.4 and No. 2.2.1 to 2.2.2 shall Be satisfied 接触电阻 $200\text{m}\Omega$ 以下 满足2.1.2 到2.1.4 项、2.2.1 到2.2.2 项.

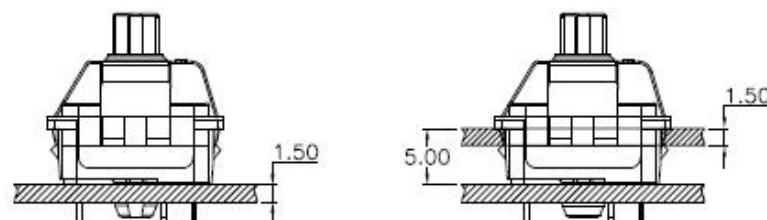


东莞市韩源电子有限公司
HANYONES ELECTRONICS CO.,LTD

No.	Item 项目	Test condition 试验条件	Performance 规格
2.3.5	Soldering heat test 耐焊接热	<p>端子焊接部分浸入焊炉，焊炉温度 $260 \pm 5^\circ\text{C}$，焊接时间 5 ± 1 秒。（焊接时不可于端子施加外力）。</p> <p>Terminals shall be dipped in the solder bath at $260 \pm 5^\circ\text{C}$ for 5 ± 1 seconds without additional force for terminals.</p>	<p>No damage (electrical and mechanical)</p> <p>无异常。 (电气、机械特性)</p>
2.3.6	Solderability 可焊性	<p>After sprayed flux / 涂上助焊剂后 temperature : $260 \pm 5^\circ\text{C}$ / 温度: $260 \pm 5^\circ\text{C}$ soldering time : 2 ± 0.5 sec / 焊接时间: 2 ± 0.5 秒</p> <p style="text-align: center;">波峰焊曲线图 (单波峰)</p>	<p>70% or more of surface area of the portion immersed in solder shall be covered by new solder / 70% 或 更多的浸焊面能被焊锡覆盖.</p>
2.3.7	Salt Mist Test 盐雾实验	<p>试件在下述实验后测量：</p> <ol style="list-style-type: none"> 温度: $35 \pm 5^\circ\text{C}$ 盐溶液浓度: $5 \pm 1\%$ (质量百分比)， 试验时间: 24 小时， 试验后, 将盐沉积物用水冲掉。 <p>The switch shall be checked after following test:</p> <ol style="list-style-type: none"> Temperature: $35 \pm 5^\circ\text{C}$ Salt solution: $5 \pm 1\%$ (Solids by mass) Duration: 24 hours, After immersing, salt deposit shall be removed by running water. 	<p>Contact resistance $200\text{m}\Omega$ max</p> <p>No. 2.1.2 to 2.1.4 and No. 2.2.1 to 2.2.2 shall Be satisfied</p> <p>接触电阻 $200\text{m}\Omega$ 以下</p> <p>满足2.1.2 到2.1.4 项、2.2.1 到 2.2.2 项. (盐雾后非镀金部位外观不作为判 定依据)</p>

3. Recommended PCB Layout 推荐的 PCB 安装焊盘规格

Mounting Options 安装选项



PCB (With Pins)

PCB Frame (Without Pins)

Circuit Board layouts 电路板布局

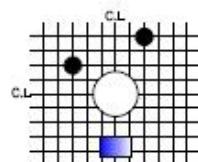
Grid line spacing=1.27mm

网格线间距=1.27mm

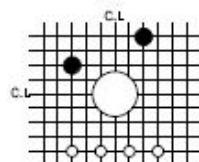
Keyswitch without Fixation Pins

按键开关不带定位柱

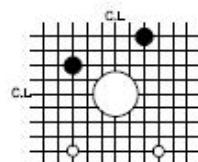
1-Pole



1-Pole w/LED



1-Pole w/Diode



○ $\varnothing 3.90+0.10/-0$

● $\varnothing 1.50\pm 0.05$

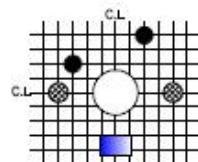
● $\varnothing 1.00\pm 0.10$

■ MAX:3.5X2.8

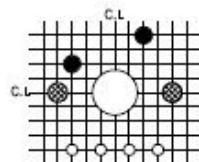
Keyswitch with Fixation Pins

按键开关带定位柱

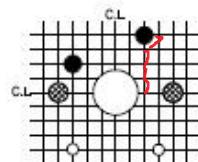
1-Pole



1-Pole w/LED



1-Pole w/Diode



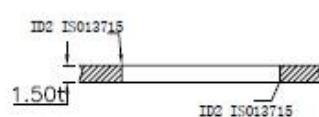
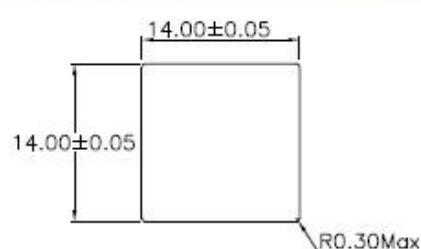
○ $\varnothing 3.90+0.10/-0$

● $\varnothing 1.50\pm 0.05$

● $\varnothing 1.00\pm 0.10$

■ MAX:3.5X2.8

Metal Frame Cutout Dimensions 金属卡板尺寸



4. Precaution 注意事项

4.1 Soldering condition 浸焊条件

ITEM 项目	CONDITION 条件
Preheat temperature 预热温度	110°C max (Embilomental temperature of soldering surface of P. W. E) 110°C 以下(印刷基板焊锡面周围的温度)
Preheat time 预热时间	60 sec, max 60 秒以内
Area of flux 助焊剂的面积	1/2 max of P. W. B. thickness 印刷基板厚度的1/2 以内
Temperature of solder 焊锡温度	260±5°C 260±5°C
Time of immersion 浸焊时间	Time of immersion 2±0.5 sec 焊接时间:2±0.5 秒
Soldering number 浸焊次数	Within 2 times (But should bring down heat of the first soldering) 2 次以内 (但应把第一次焊锡的温度降下来)
Printed wiring board 印刷基板	Single sided copper-clad laminates 单面铜箔

1) After switches were soldered, please be careful not to clean switches with solvent

开关浸焊后, 注意不要用溶剂清洗.

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

在使用铬铁的情况下, 焊锡温度应在350±10°C 以下, 3 秒以内.

4.2 Note (注意点)

1) Please be cautious not to give excessive static load or shock to switches.

注意不要施加超负荷的压力或晃动开关.

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

开关焊接以后, 印刷基板注意不要叠放.

3) Preservation under high temperature and high humidity or corrosive gas should be avoided

Especially. When you need to preserve for a long period, do not open the carton.

保管时尤其应注意避开高湿高温和有腐蚀性气体的环境. 如需长时间保存, 请不要打开包装箱.

4) The standard storage period is 3 months, with maximum up to 6months, preferably to be used as soon as possible. After opening the package, you should put the remaining switches in a plastic bag to prevent from damp and corrosive gas.

保存标准为 3 个月, 限度为 6 个月以内, 请尽早使用. 打开包装后, 有剩余品时, 应将剩余部分以胶袋包装好以同外界隔离, 请进行合适的防湿, 防腐蚀气体等处理后进行保管.

5) The specification is the technical consensus between the customer and our company's products. Any content inconsistent with the specification in other relevant data is invalid

该规格书为客户与我公司产品在技术方面的共识, 其他相关数据上与该规格书不一致的内容都是无效的.

6) If customer issue purchase orders without confirmation by signature of this specification after receipt, such confirmation will be considered as granted upon receipt of the first purchase order.

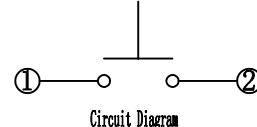
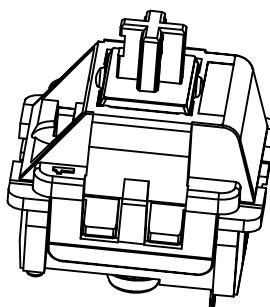
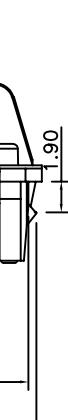
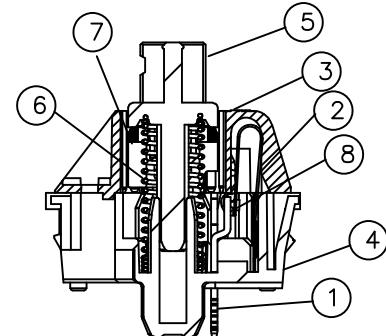
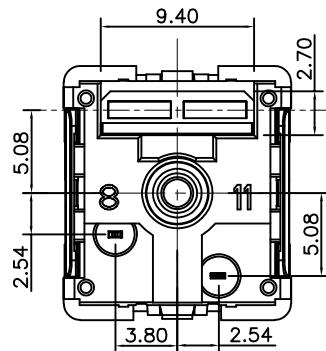
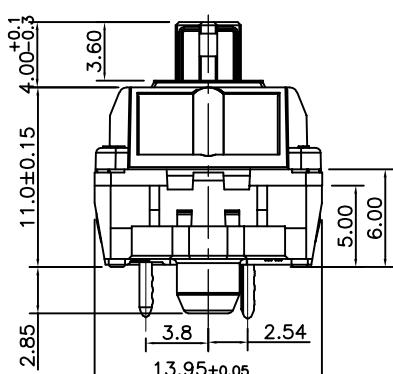
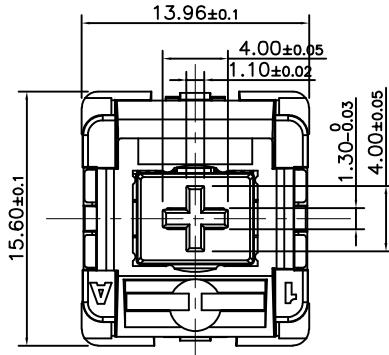
如果顾客收到规格书后没有信息反馈而直接向我公司订货, 我们将认为贵客已接受此规格书.

7) If there is no order or no request for new specification after 1 year upon this specification is issued, the specification will be regarded as invalid.

本产品规格书从生效日起 1 年后, 如果没有订货或再次申请最新规格书时请做无效处理.

8) Products meet the ROHS environmental management substances control standards

产品满足 ROHS环境管理物质管制标准



Technical parameters:

Voltage:	12 VAC/DC max	2 VDC min
Current:	10mA AC/DC max	10µA DC min
Insulation Resistance:	100MΩ at 100V(min)	
Initial Contact Resistance:	200mΩ max	
Bounce Time:	≤5msec	
Capacitance:	<2pF (at 1kHz)	
Operating Temperature:	-10° C to +70° C	
Storage Temperature:	-40° C to +70° C	
Solderability:	Wave solder, 5 seconds at 260±5° C	
Long life :	50,000,000 cycles	
Work Force:	50±10gf	
Total Travel:	4.00mm	
Pretravel:	2.20±0.5mm	
Tactile Force:	60±10gf	
Choice of feel:	click tactile	

8	Contact	/	2PCS	Ni	Plated Gold	/
7	Housing		1PCS	POM	White	
6	Spring	/	1PCS	Stainless Steel	/	/
5	Kone	/	1PCS	POM	Cyan-Blue	/
4	Housing	/	1PCS	PA	Black	/
3	Cover	/	1PCS	PC	Transparent	/
2	Contacts	/	1PCS	Copper		/
1	Terminal	/	1PCS	Copper		/

序号 ITEM	零件 PART NAME	端子编号 TER' NO.	用 量 QTY.	材 质 MATERIAL	电镀/颜色 FINISHING	备 注 REMARK
------------	-----------------	------------------	-------------	-----------------	--------------------	---------------

ECN BO.		DESCRIPTION.			DATE.	REV.	A 漢源
DESIGNED	CHECKED	APPROVAL	DRAWING NUMBER			SCALT: 1/2	SCALE: 3:1
Mikey	Tom	Jerry	PART NAME	CPG151101D13	UNLESS OTHERWISE	X. ±0.25	X. x ±0.20
			MODEL NAME	CPG151101D13	SPECIFIED,TOLERANCE:	X.xx ±0.15	X. ANGULAR ±3°
			3RD ANGLE PROJ	HanElectricity Co.,LTD			FILE.NO.