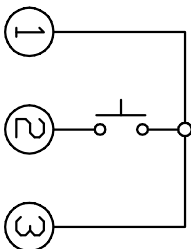
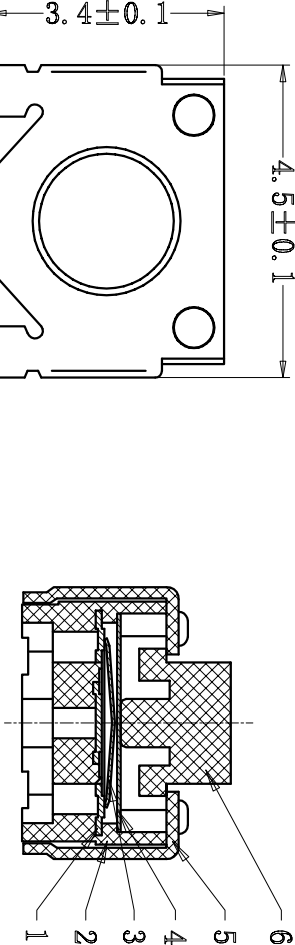
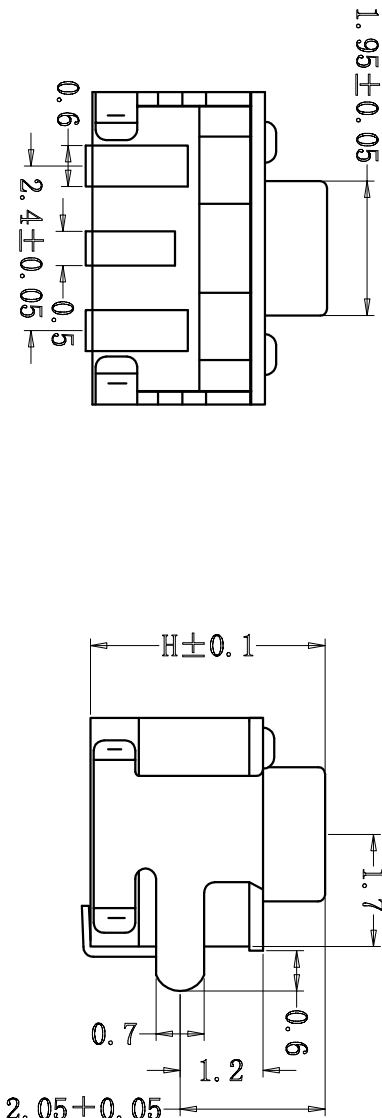
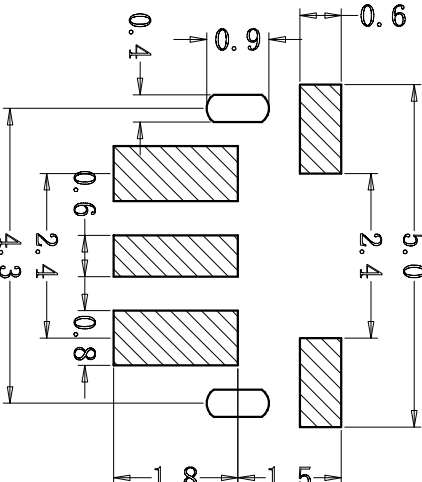


规格 Specifications

额定负荷 Rating	DC 12V/50mA
接触电阻 Contact Resistance	100mΩ max.
绝缘电阻 Insulation resistance	DC100V 60S 100MΩ min.
抗电强度 Dielectric strength	AC250V(50-60Hz) 60S min.
操作力 Operation force	160±30gf
寿命试验 Operating Life	100,000 cycles
行程 Travels	0.25±0.1mm
包装数量 Packed Quantity	2000PCS/箱



CIRCUIT DIAGRAM
回路图



RECOMMENDED P.C.B. LAYOUT
安装尺寸图

PRODUCT NO.: 1TS022EL***-3500 DE - CT
轻触开关
4.5X3.4系列
外形:
按钮颜色:
底座颜色:
盖板颜色:
操作力度:
160=160gf
180=180gf
250=250gf
手感:
0=常规
1=大手感
2=小手感
3=特殊手感
材料:
0=初始材料
1=新增材料
依次增加
产品高度(H):
350=3.50mm
编带
非编带,不启用

6	ACTUATOR	1	SILICONE	BLUE
5	COVER	1	BRASS	Sn-PLATED
4	FILM	1	PI	YELLOW
3	DOME	2	SUS301	Ag-PLATED
2	HOUSING	1	LCP	BLACK
1	TERMINAL	2	PHOSPHOR	Ag-PLATED
ITEM	PART NAME	QUANTITY	MATERIAL	FINISH

X. ± 0.3	X' ± 3'	UNITS	NAME(INTENDED USE)	HON YUAN
.X ± 0.2	.X' ± 2'	MAT'L	4.5X3.4 TACT SWITCH	HON YUAN PRECISION IND. CO.,LTD. GUANGDONG, CHINA.
.XX ± 0.1	.XX' ± 1'	FINISH	PART NO.(INTENDED USE)	TITLE: PRODUCT DRAWING
.XXX ± 0.05	.XXX' ± 0.5'	Q'TY	APPD: W.P.Lu 2024.07.25 CHKD: S.L.li 2024.07.25 DR: C.Li 2024.07.25	DWG NO.: 1TS022EL-1600-3500DE-CT
THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF HON YUAN PRECISION IND. CO., LTD. AND ARE NOT TO BE REPRODUCED, COPIED OR USED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF HON YUAN PRECISION IND. CO., LTD.		SCALE	SHEET	REV.
		15/1	1/1	A



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322	PAGE	1 OF 12	REV.	A
---	--	------------------------------------	------	---------	------	---

***** 目 录 *****

项 目	Item	内 容 Description	页 次 Page
		目录 Content	1
		修订履历 Revision History	2
1		通则 General Characteristics	3
	1.1	应用范围 Application range	3
	1.2	使用环境条件 Acclimatization	3
	1.3	测试条件 Test Conditions	3
2		外观和安装尺寸	3
	2.1	外观 Appearance	3
	2.2	安装尺寸 Mounting dimensions	3
3		驱动方式 Operate Mode	3
4		回路方式 Circuit Mode	3
5		额定负荷及寿命 Rating and Operating life	3
6		电气性能 Electrical Characteristics	4
7		机械性能 Mechanical Characteristics	6
8		耐久性试验 Durability Characteristics	9
9		耐候试验 Weather Proof Characteristics	9
10		测试顺序 Test Sequence	11
11		有害物质管控 Harmful material control	12

	APPROVED	CHECKED	PREPARED	ISSUED BY:
BY	W.P.Lu	S.L.Li	C.Li	
DATE	2024.07.25	2024.07.25	2024.07.25	

[illegible]



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322			
		PAGE	3 OF 12	REV.	A

1. 通则 **General Characteristics**

1.1 应用范围 **Application range:**

此产品规格书适用于轻触开关 1TS022EL-1600-3500DE-CT。

This product specification is applied to the 1TS022EL-1600-3500DE-CT push-on type tact switch.

1.2 使用环境条件 **Acclimatization:**

使用温度范围 Operating Temperature range: -40℃~85℃

保存温度范围 Preservative Temperature range: -40℃~85℃

1.3 测试条件 **Test Conditions:**

若没有特别说明,则试验条件如下:

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

温度 Temperature: 5~35℃

相对湿度 Relative Humidity:25~85%

气压 Air pressure:86~106Kpa

如对判定产生疑义, 则试验按以下条件进行:

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

温度 Temperature:20±2℃

相对湿度 Relative Humidity:65±5%

气压 Air pressure:86~106Kpa

2. 外观和安装尺寸 **Appearance & Mounting Dimensions:**

2.1 外观 **Appearance:**

产品外观良好,无破损、锈蚀、裂纹和镀层缺陷。

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

2.2 安装尺寸 **Mounting dimensions:**

应符合产品外形图 1TS022EL-1600-3500DE-CT 的要求。

Refer to product appearance drawing No.:1TS022EL-1600-3500DE-CT

3. 驱动方式 **Operate Mode:**

按钮式 Push-on types.

4. 回路方式 **Circuit Mode:**

如成品图 1TS022EL-1600-3500DE-CT 所示(as assembly drawing 1TS022EL-1600-3500DE-CT).

5. 额定负荷及寿命 **Rating and Operating life.**

额定负载 Rating: DC12V, 50mA max.

负荷寿命 Operate Life With Load: 100,000cycles.



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322			
		PAGE	4 OF 12	REV.	A

6. 电气性能 **Electrical Characteristics**

6.1 外观检查 **Visual Examination**

测试条件 Test Method/Condition	标准 Criteria
产品在未受力的情况下进行外观检查。 By Visual Examination choke without any out Pressure & testing.	产品无明显缺陷,不影响使用 There shall be no defects that affect the serviceability of the product.

6.2 接触电阻 **Contact Resistance**

测试条件 Test Method/Condition	标准 Criteria
开关在无电气负荷状态下，动作 3 次以上后，用接触电阻测试仪器测量各接点的接触电阻。 Switch without load, operate more than 3 times, use contact resistance testing apparatus to test the contact resistance of each point of contact.	常态 Normal 100mΩ max 气候及寿命试验后 after weather and life proof: 200mΩ max

6.3 绝缘电阻 **Insulation resistance**

测试条件 Test Method/Condition	标准 Criteria
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 100VDC ，持续时间 60 ±5 S。 100VDC Voltage is applied between each pair of terminals and between the terminal and the metal frame for 60±5S.	常态 Normal 100MΩ min 气候及寿命试验后 after weather and life proof: 10MΩ min

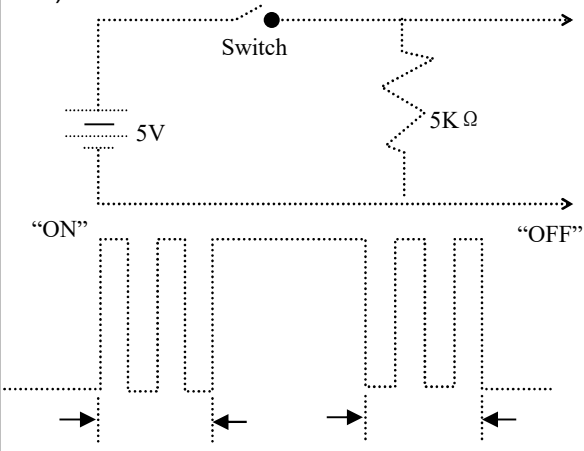


文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322	PAGE	5 OF 12	REV.	A
--	--	------------------------------------	------	---------	------	---

6.4 抗电强度 Dielectric strength

测试条件 Test Method/Condition	标准 Criteria
在相互绝缘的所有接线端子之间加载 250VAC (泄漏电流应不超过 0.5mA)的交流电,持续时间 60±5 S。 250VAC (leak current 0.5mA max) alternate current load is applied between open terminals connected with wires, for 60±5S	无击穿和飞弧现象。 No dielectric breakdown shall occur.
各接线端子与金属铁壳之间加载 250VAC (泄漏 电流应不超过 0.5mA) 交流电,持续时间 60±5 S。 250VAC (leak current 0.5mA max) alternate current load is applied between terminal and metal cover, for 60±5S.	无击穿和飞弧现象。 No dielectric breakdown shall occur.

6.5 弹跳 Bounce

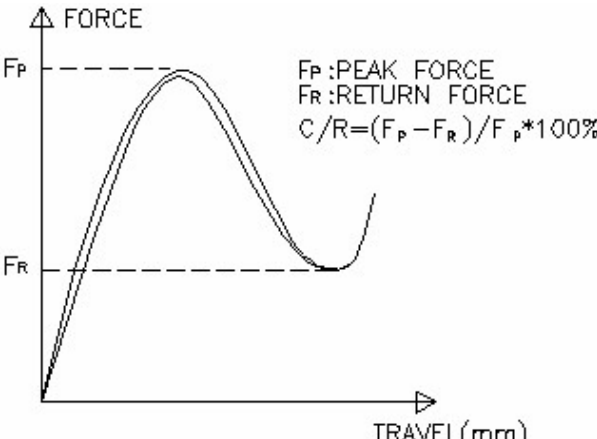
测试条件 Test Method/Condition	标准 Criteria
开关在正常的操作条件下 (3~4 次/秒), 测试通 断弹跳时间。 Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec.) bounce shall be tested at 'ON' and 'OFF'. 	10 m seconds max



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322
		PAGE 6 OF 12 REV. A

7. 机械性能 Mechanical Characteristics

7.1 操作力&回弹力 Operation force & Return force

测试条件 Test Method/Condition	标准 Criteria
在操作按钮末端沿操作方向均匀施加静载荷至行程末端,量测最大力度 A static load shall be applied to the tip of actuator in operating direction. Measure the maximum force during all the travel.	FP =160±30gf
在操作按钮末端沿操作方向均匀施加静载荷,量测按钮返回过程中最小力度 A static load shall be applied to the tip of actuator in operating direction. Measure the minimum force during actuator return.	FR =50gf min.
	

7.2 行程 Travels

测试条件 Test Method/Condition	标准 Criteria
开关发生转换后,操作组件末端与初始位置之间的距离。 Distance from the end of operating component to the start position when switch is being transformed	0.25±0.1mm



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322	PAGE	7 OF 12	REV.	A
--	--	------------------------------------	------	---------	------	---

7.3 操作件强度 Operating Part Strength

测试条件 Test Method/Condition	标准 Criteria
置开关于正常安装位置, 在操作件中心施加与操作件动作相反方向的 3000gf 静负荷, 时间为 15 S. Put the switch in the normal gearing position, Bring 3000gf pressure which direction is opposite to the actuator operates direction in the tip of the actuator center, time is 15S.	无机械和电气损伤。符合第 7.1 & 7.2 项要求。 The switch shall be free from abnormalities in electric and mechanism. According to item 7.1 & 7.2 to examine.

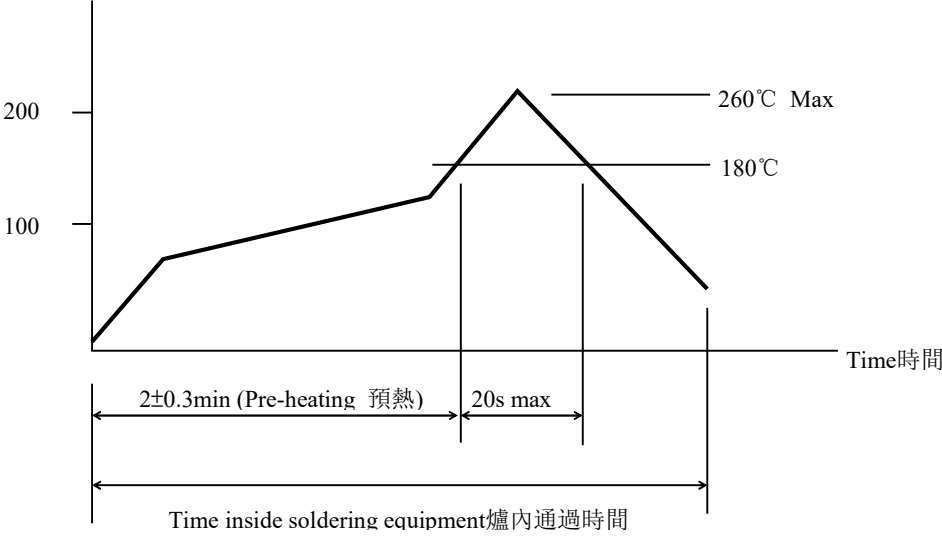
7.4 耐焊接热 Solder Heat Resistance

测试条件 Test Method/Condition	标准 Criteria
试件在下述条件下进行试验: 焊槽试验: 1) 焊接温度: $245 \pm 5^{\circ}\text{C}$; 2) 焊接时间: $2 \pm 0.5\text{ S}$; 3) 熔锡面积: PCB 板厚度的一半 PCB: $t=1.6$) 。 Switch shall be checked after following test: Solder trough test: 1) Soldering temperature: $245 \pm 5^{\circ}\text{C}$; 2) Soldering time: $2 \pm 0.5\text{ S}$; 3) Soldering area, $t/2$ of PCB thickness (PCB: $t=1.6$)	无机械和电气损伤。符合第 6.5 项要求。 The switch shall be free from abnormalities in electric and mechanism. According to item 6 .5 to examine.



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322			
		PAGE	8 OF 12	REV.	A

7.5 可焊性 Solder Ability

测试条件 Test Method/Condition	标准 Criteria
焊接温度参考如下 IR 图表 TL(L)-6□□ Soldering Temperature: SEE IR chart	超过 66%的焊锡面积被焊料覆盖。 More than 66% of surface area of the portion immersed shall be covered with solder.
	



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322	PAGE	9 OF 12	REV.	A
--	--	------------------------------------	------	---------	------	---

8 耐久性试验 Durability Characteristics

8.1 寿命试验 Operating Life

测试条件 Test Method/Condition	标准 Criteria
在额定负荷的条件下，在寿命测试设备上连续转换100,000 次，频率:60 次/分钟。操作力为规格值的最大值 100,000 cycles of operation shall be performed continuously with load at a rate of 60 cycles per minute. Push force: Maximum value of operation force.	1) 动作力: 初始值的 $\pm 30\%$ 。 Operating force : within $\pm 30\%$ initialization value. 2) 接触电阻: 200 m Ω Max Contact resistance 200 m Ω Max 3) 绝缘电阻: 10M Ω min Insulation Resistance: 10M Ω min 4) 弹跳 10 ms max Bounce 10 m sec max

9 耐候试验 Weather Proof Characteristics

9.1 耐低温 Resistance Low Temperature

测试条件 Test Method/Condition	标准 Criteria
试件在-30 $\pm 2^{\circ}\text{C}$ 的温控箱内保持 96 小时,然后在正常温度和湿度下恢复 1 小时，并在此后的 1 小时内对试件进行测量，水滴应消失。 After testing at -30 $\pm 2^{\circ}\text{C}$ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made with 1 hour after that, water drops shall be eliminated.	符合第 7.1 项要求 As shown in item 7.1



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322			
		PAGE	10 OF 12	REV.	A

9.2 耐热性 Heat Resistance

测试条件 Test Method/Condition	标准 Criteria
试件在 80±2℃ 的温控箱内保持 96 小时，然后在正常温度和湿度下恢复 1 小时，并在此后的 1 小时内对试件进行测量，水滴应消失。 After testing at 80±2℃ for 96 hours the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour and measurement shall be made with 1 hour after that, water drops shall be eliminated.	符合第 7.1 项要求 As shown in item 7.1

9.3 恒定湿热 Humidity Resistance

Test Method/Condition	Requirement
试件在 60±2℃，90~95%RH 的温控箱内保持 96 小时，然后在正常温度和湿度下恢复 1 小时，并在此后的 1 小时内对试件进行测量，水滴应消失。 After testing at 60±2℃,90-95%RH for 96 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.	1) 符合第 7.1 项要求 As shown in item 7.1 2) 接触电阻: 200 mΩ Max Contact resistance 200 mΩ Max 3) 绝缘电阻: 10MΩ min Insulation Resistance: 10MΩ min



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322			
		PAGE	11 OF 12	REV.	A

10 测试顺序 Test Sequence

测试项目 Test Description	测试组别 Test Group								Samples (n)
	A	B	C	D	E	F	G	H	Defective(C)
1.外观检查 Visual examination	1,10	1,9	1,13	1,13	1,13	1,13			n=5,C=0
2.操作力 Operating force	2,9	2,8	2,12	2,12	2,12	2,12			n=5,C=0
3.回弹力 Return force	3,8	3,7	3,11	3,11	3,11	3,11			
4.接触电阻 Contact resistance	4,7	4,6	4,10	4,10	4,10	4,10			n=5,C=0
5.抗电强度 Dielectric strength			5,9	5,9	5,9	5,9			n=5,C=0
6.绝缘电阻 Insulation resistance			6,8	6,8	6,8	6,8			n=5,C=0
7.寿命试验 Operating Life		5							n=5,C=0
8.耐低温 Resistance Low Temperature			7						n=5,C=0
9.耐热性 Heat Resistance				7					n=5,C=0
10.恒定湿热 Humidity Resistance					7				n=5,C=0



文件名称 DOCUMENT NAME: PRODUCT SPECIFICATION	主 题 SUBJECT: 4.5x3.4 TACT SWITCH 1TS022EL-1600-3500DE-CT	文件编号 DOCUMENT NO.: EB1-AS1C-322	PAGE	12 OF 12	REV.	A
--	--	------------------------------------	------	----------	------	---

11. 有害物质管控 Harmful material control

环保要求 ENVIRONMENT SPECIFICATION

下列 8 种环境有害物质禁止使用，其前处理方式及测试方法依据客户规定办理

1	鎘及其化合物 (Cadmium and cadmium compounds)
2	PBB (多溴聯苯)類 & PBDE (多溴化二苯醚)類 PBB (Polybrombiphenyl) category PBDE (PolyBrominated biphenyl ethers) category
3	多氯聯苯 (PCB)類 PCB (Polychlorinated biphenyl) category
4	多氯化奈類 Polychlorinated naphthalene categor
5	有機錫化合物 (三丁基錫類 & 三苯基錫類) Organic tin compounds (Tributyl tin category & Triphenyl tin category)
6	石棉 (Asbestos)
7	偶氮化合物 (Azo compounds) (可能分解 生成揮發胺, 不允許使用於與人體持續接觸之部位)
8	FR-720 等溴素系難燃劑(CAS No. 21850-44-2)(FR-720 and similar flame retardant classified as CAS No. 21850-44-2)