



## Specifications of Capacitive Touch Film

### 电容触摸屏规格承认书

Product Name 品名	21.5inch Capacitive Touch Panel 21.5 英寸电容式触摸屏
Customer Name 客户名称	RUSSIA
Supplier 制造商	SINOTELECTRONICS INC. 苏州工业园区思诺泰科创电子有限公司
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## Warranty

Products manufactured to these specifications shall be capable of meeting all characteristics from SNT's delivery onwards for a minimum period of 1 year when stored and used as specified under normal conditions within the contents of these sheets.

保质期

此规格触摸屏，从思诺出货之日起至少一年内，应全部符合下列正常条件下的储存和使用规格。

## 1 Application 适用范围

The specification is for Projected Capacitive Touch Screen.

此规格书适用于投射式电容触摸屏。

## 2 Module Specification 模组规格

### 2.1 Basic Features 基本特性

Item 项目	Feature 特性	Remarks 备注
Controller 控制芯片	SIW4104C	-
Channel 通道数	RX:60 TX: 34	-
Power 电源	2.8~3.3V	
Communication 通讯接口	USB	
Number of Touch point 触点数量	10 点	-
O.S. 可支持操作系统	Windows/ Android/Linux	

### 2.2 Mechanical Characteristics 机构特征

Item 项目	Specification 规格	Unit 单位
Scope 触摸类型	多点投射式电容触摸屏	-
Screen Size 屏幕尺寸	21.5	Inch
Module dimension 模组尺寸		mm
Viewing Area 可视区	478(L)×269.80(W)	mm
Cover lens O.D 盖板	524(L)×321.80(W)	mm

## 2.3 Optical Characteristics 光学特性

Item 项目		Specification 规格
Transparency 透光率	Viewing Area 可视区域	≥85%

## 3 Sensor Specification 传感器规格

Item 项目		Specification 规格	Unit 单位
Stacked structure 叠构	Cover 盖板	1.8	mm
	UV	0.2	mm
	Sensor	1.1	mm
Sensor Dimension 传感器尺寸	OD Size	X	508
		Y	303.8

## 4 Mechanical Characteristics 机械特性

Item 项目		Specification 规格	Result 结果
Cover lens 盖板部分	Ball Drop 落球测试	200g ± 2g 35cm	One drop test on each of the 5 selected points, No damage 5 点测试 ( 4 边加中心 点), 无破损
	Hardness 硬度测试	Pencil: 6H Pressure: 1N/45°	Hardness ≥ 6H
	Warpage 翘曲度	By Gauge	Warpage 0.1% ≤ Length *

FPC/COF 软性电路板	弯折测试 Bending	Bending range 0-180° 30times Electrical Function ok FPC 弯折 180° 30 次内电性 ok	-
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## 5 Electronic Specification 电气规格

### 5.1 Absolute Maximum Ratings 绝对最大额定值

Item 项目	Type 类型	Value 值	Unit 单位	Remarks 备注
Operating Temperature 操作温度	-	-20 ~ +70	°C	Humidity 湿度 20%~85% RH
Storage Temperature 存储温度	-	-30 ~ +80	°C	Humidity 湿度 20%~85% RH
ESD 要求	ESD air requirement	±8	KV	空气
	ESD contact requirement	±6	KV	接触

### 5.2 I2C Interface I2C 总线接口

Pin	Pin Name	Pin Attribute	Description
1	VDD_2.8		
2	GND		
3	EINT 1.8V		
4	RST 1.8V		
5	SCL 1.8V		
6	SDA 1.8V		

## 6 Visual Inspection 外观检验

### 6.1 Cosmetic Inspection 外观检查:

The following standard only applies to the visual areas. If the TP function is good, the non-visual appearance may negotiate to relax the standard. W=Width L=length D=Diameter GT=Glass thickness. If soft cloth which dips in alcohol can wipe besmirch, it does not apply to this appearance standards.

以下标准只适用于可视区。只要 TP 功能良好非可视区的外观可协商放宽标准。W=Width L=length D=Diameter GT=Glass Thickness.可用软布沾酒精(ethyl alcohol)能擦干净的污渍,不适用于该外观标准。

1、 Inspection methods and conditions (检验方法与条件):

**1) Inspection environment: Temperature: 20-22 °C; Humidity: 65 + 10% RH;**

检验环境：温度：20-22°C；湿度：65 + 10% RH；

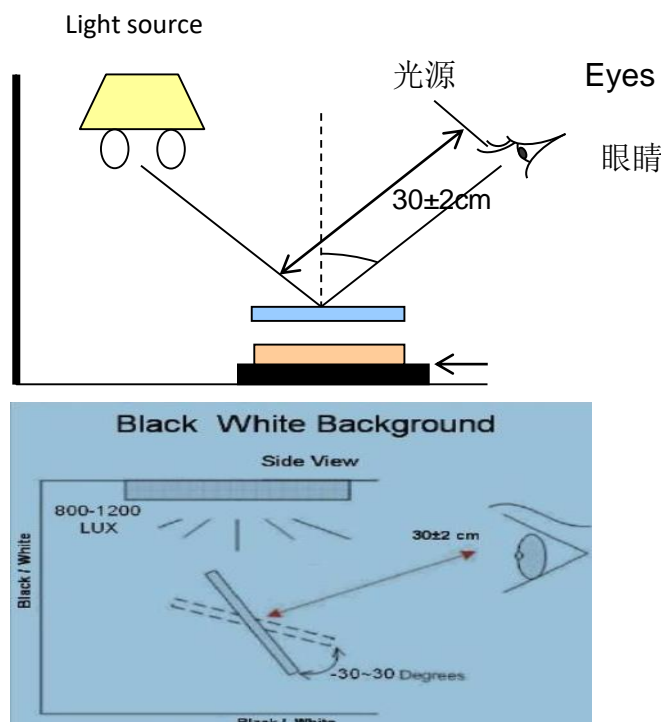
**2) Inspector qualifications: The appearance of product must be inspect by a good eyesight inspector.**

检验人员所具备的条件：产品的外观必须经一个视力良好的人员进行检验

**3) Inspection methods: The distance between inspector and product should be 30±2cm and putting a lamp 12 to 20 watts of cold white fluorescent lamp in the observation station of product.**

检验方式：检验人员距离产品的距离应为 30±2cm, 在产品的观察处放置一盏 12~20 瓦的冷白色的荧光灯

如下图标：



Pay attention to the following  
下事项：

matters when inspection: 检验时注意以

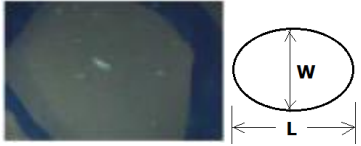


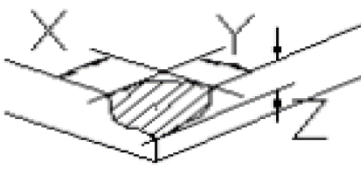
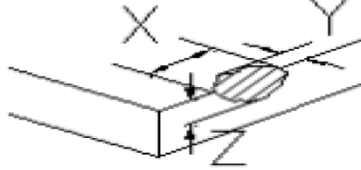
A. Inspectors must wear a fingerstall. 检验人员必须佩带指套.

B. Put the product in front of inspector, hands hold the edge of products carefully and can't make it bended. 将检验的产品置于检验员前方的位置，双手小心托住产品边缘，不能使产品弯曲。

C. Inspectors shouldn't stare at a certain point but continue covered watching. 检验者的眼神应持续的覆看而不是具体的盯住某一点看

D. According to the following standards judge whether products conform to the requirement. If found other defect, from perspective of appearance consider whether customers accept this defect in end product. 依据下面提供的标准判断产品是否符合要求，若发现有其它不良，从外观角度看客户在成品方面是否可接受此不良

# 7 Cosmetic Inspection Standard Ver.1 外观检验标准

Items 项目	Judgments Standards 判定标准	备注 Notes
Dot shape defect 点状缺陷	<ol style="list-style-type: none"> <li><math>D \leq 0.35\text{mm}</math>, Ignored 合格</li> <li><math>0.35\text{mm} &lt; D \leq 0.8\text{mm}</math>, <math>N \leq 10</math>, <math>DS \geq 10\text{mm}</math>, Ignored 合格</li> <li><math>D &gt; 0.8\text{mm}</math>, <math>N \leq 0</math> (not allowed) 不合格</li> </ol>	
Line shape defect 线装缺陷	<ol style="list-style-type: none"> <li><math>L \leq 15\text{mm}</math>, <math>w \leq 0.2\text{mm}</math>, Ignored 合格</li> <li><math>0.2\text{mm} &lt; W \leq 0.35\text{mm}</math>, <math>L \leq 15\text{mm}</math>, <math>DS \geq 10\text{mm}</math>, Ignored 合格</li> <li><math>W &gt; 0.35\text{mm}</math>, <math>N \leq 0</math> (not allowed) 不合格</li> </ol> <p>When U or @ shape object found: Calculation formula <math>D = (L+W) / 2</math> 型、@型的毛丝: 按 <math>D = (L+W) / 2</math> 计算</p>	 <p>W=width; 宽度 L=length; 长度 N=number of defectiveness 数量 <math>D = (W+L)/2</math></p>
Dents/bubbles 凹凸点/气泡	<ol style="list-style-type: none"> <li><math>D \leq 0.35</math>, <math>DS \geq 10\text{mm}</math>. Ignored 合格</li> <li><math>0.35 &lt; D \leq 0.5\text{mm}</math>, <math>DS \geq 10\text{mm}</math>, <math>N \leq 10</math>, Ignored 合格</li> <li>Others are not allowed 其他情况都判不合格</li> </ol>	
Corner chipping 崩角	<p>Corner Crack: <math>X \leq 5\text{mm}</math>, <math>Y \leq 3\text{mm}</math> and <math>Z \leq t</math> (except for apparent surface), allowed to accept 3.</p> <p>角破损: <math>X \leq 5\text{mm}</math>, <math>Y \leq 3\text{mm}</math> 并且 <math>Z \leq t</math> (玻璃面不允许有), 允许接受 3 个</p>	
Side chipping 崩边	<p>General Crack: <math>X \leq 6\text{mm}</math>, <math>Y \leq 1.0\text{mm}</math> and <math>Z \leq 1/2t</math> (except for apparent surface), allowed to accept 5.</p> <p>边破损: <math>X \leq 6\text{mm}</math>, <math>Y \leq 1.0\text{mm}</math> 并且 <math>Z \leq 1/2t</math> (玻璃面不允许有), 允许接受 5 个</p>	
Stain 脏污	<p>That can be cleaned within 15seconds. Ignored 15秒内可以擦拭洁净的部分判定为合格</p>	
Color/LOGO/typeface/printing on cover lens; Defilade performance of background color 面板颜色图案字体及底色的遮蔽性	<p>There is no color difference from samples. Ignored 颜色与标准样品比较无明显色差. 合格</p>	
	<p>LOGO/typeface/printing: uniform and clear. Ignored 字体和图案清晰 字体无粗细现象. 合格</p>	
	<p>The defilade performance of background color: looks good. Ignored 底色遮蔽性良好. 合格</p>	
	<p>Placement tolerance <math>&lt; 0.3\text{MM}</math>. Ignored. 套版准确允许偏差 <math>&lt; 0.3\text{MM}</math> 合格</p>	



Notes 备注	For other particles or linear objects, please refer to the criterion above 其他点状/线状不良参照点状、线状标准
	Number of defectiveness for each touch panel: N≤10, DS≥0mm 每片成品最多不良数 N≤10,不良间距≥10mm

## 8 Reliability Conditions 可靠性条件

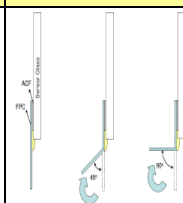
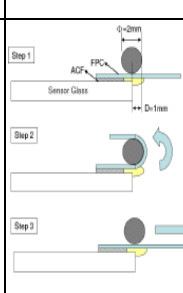
### 8.1 Reliability Test Report 可靠性实验报告

Reliability test report 可靠性实验报告			
<b>Objects</b> 验证对象	<input type="checkbox"/> Raw material 原材料 <input type="checkbox"/> New production process 新工艺 <input type="checkbox"/> Abnormal item 异常项 <input type="checkbox"/> New product 新品 <input type="checkbox"/> Finished product 成品 <input type="checkbox"/> Sample 样品 <input type="checkbox"/> 实验规范 Experiment procedure and method <input type="checkbox"/> 其他 Others <input type="checkbox"/> 产线计划验证 Production line program		
<b>Purpose:</b> to verify the applicability of the experimental product when being stored,transported and used under the extreme environmental conditions. 实验目的：验证实验产品在极限环境条件下运输、使用、储存的适应性。			
<b>Experiment requirements:</b> 实验要求： <p>①Before the experiment, make sure the functions of the product must be good,while the cosmetic may be good or non-good according to the purpose of the experiment.              实验前产品功能为良品,外观可以根据实验目的选择良品或者不良品。</p> <p>②If it is necessary to do the experiment again,make sure all materials must be put in the same room for at least 2hrs and make sure that there is no water vapor on its surface.              实验结束后需要室温静置 2H 以上,材料表面干燥无水气再进行检测。</p> <p>③It is prohibited to open the door before we finish the whole experiment.              实验周期禁止打开实验设备门。</p> <p>④The product is requested to be kept for more than 1 years,after the experiment.              实验后产品需要保留 1 年以上。</p>			
No.序号	Items 项目	Test condition 实验条件	Criterion 判定标准



1	High temperature and humidity test 高温高湿	<p>1. Temperature 温度: 60°C</p> <p>2. Humidity 湿度: 90%RH</p> <p>3. Time: finished product 120H 时间: 成品 120 小时</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
2	Temperature Switching impact test 冷热冲击	<p>1. High temperature 高温: 80°C</p> <p>2. Low temperature 低温: -30°C</p> <p>3. 30 times in cycle 30 次循环</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
3	Salt spray test 盐雾实验	<p>1. Concentration 浓度: 5% NaCl solution</p> <p>2. Temperature 温度: 35°C</p> <p>3. Time: finished product 48H 时间: 成品 48 小时</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
4	High temperature storage test 高温存储	<p>1. Temperature 温度: 80°C</p> <p>2. Time 时间: 120H</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
5	Low temperature storage test 低温存储	<p>1. Temperature 温度: -30°C</p> <p>2. Time 时间: 120H</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
6	Red ink test 红墨水	<p>1. Room temperature 常温</p> <p>2. Time 时间: 8H</p>	<p>1. No ink infiltration 无进液</p> <p>2. All functions are good 功能正常</p>
7	Hand sweat test 手汗	<p>1. Sweat 汗液 PH=4.7</p> <p>2. Time 时间: 48H</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK</p>
8	Static electricity test 静电	<p>1. Air discharge 空气放电: 8KV</p> <p>2. Contact discharge 接触放电: 6KV</p> <p>3. Times: 10 times for each point 次数: 各 10 次/点</p>	<p>Appearance test refer to standard OK</p> <p>Function detection OK</p> <p>外观参照标准检验 OK</p> <p>功能检测 OK 常</p>

## 8.2 Touch Panel FPC Test Items and Criteria 触摸屏 FPC 测试项目和标准

Test Item 测试项目	Qty 数量 (pcs)	Touch Panel FPC Test Items and Criteria 触控屏 FPC 测试项目与标准	Note 备注
Direct Pulling Test 直拉测试	5	<p>Test Conditions 测试条件:</p> <ol style="list-style-type: none"> <li>Pulling weight 拉力重量: 500g.</li> <li>Pulling speed 拉力速度: 25 mm/min</li> <li>Pulling angle 拉力角度: 90°</li> <li>After test, verify touch panel functionality via test jig 测试之后通过测试工具测试触摸屏功能</li> </ol> <p>Pass Criterion 判定标准:</p> <ul style="list-style-type: none"> <li>No damage of FPC itself FPC 自身没有损伤</li> <li>No any peeling on FPC located on bonding pad area 焊接区域没有任何剥离</li> <li>No functional failure after test 测试后没有功能不良</li> </ul>	
Bending test 弯曲测试	5	<p>Test Conditions 测试条件:</p> <ol style="list-style-type: none"> <li>45 degree bending: 100 times 45°弯折 100 次</li> <li>90 degree bending: 200 times 90°弯折 100 次</li> <li>After test, verify touch panel functionality via test jig 测试之后通过测试工具测试触摸屏功能</li> </ol> <p>Pass Criterion 判定标准:</p> <ul style="list-style-type: none"> <li>No damage of FPC itself FPC 自身没有损伤</li> <li>No any peeling on FPC located on bonding pad area 焊接区域没有任何剥离</li> <li>No functional failure after test 测试后没有功能不良</li> </ul>	
	5	<p>Test Conditions 测试条件:</p> <ol style="list-style-type: none"> <li>Flex bending: 30 cycles (Each cycle 每次循环: 0° -&gt; 180° -&gt; 0°)</li> <li>After test, verify touch panel functionality via test jig 焊接区域没有任何剥离</li> <li>bending <math>\phi=1</math> mm (弯折直径=1mm)</li> </ol> <p>Pass Criterion 判定标准:</p> <ul style="list-style-type: none"> <li>No damage of FPC itself FPC 自身没有损伤</li> <li>No any peeling on FPC located on bonding pad area 焊接区域没有任何剥离</li> <li>No functional failure after test 测试后没有功能不良</li> </ul>	

## 9 Function Test 功能检测

### 9.1 Inspection methods and conditions 测试方法及条件

Connect jigs(Supplier provide test jigs and test software)to a computer; test touch function of products in normal electrical characteristics.

将测试治具（供应商提供测试治具及测试软件），连接电脑；在正常的电气特性下对产品的触摸功能进行检测。

### 9.2 Inspection standards 检验标准

Don't allow any function abnormalities

不允许出现任何的功能异常。

## 10 Use Cautions 使用注意事项

## 10.1 Storage Cautions 储存注意事项

Storage products must according to the temperature and humidity of product specification and do not accept direct sunlight or heavy weight.

储存产品时须按产品规格书的温湿度要求放置，注意不可受日光直射或重物重压

## 10.2 Move Cautions 搬运注意事项

Must maintain clear clarity of sample, so please wear fingerstalls or gloves before you contact product. Gloves and mask will have stains and hold product around please when you hold the product. Avoid causing the lead loosing, please don't take the lead when you take out the product .

须保持产品的透明清晰度，因而请在接触产品之前戴上指套或手套，当握拿产品时，手套和面罩会有污点，并且握拿产品时请握住产品的四周。在取出产品时，请不要握拿引线避免造成引线松动

## 10.3 Combination Install Cautions 组合上机注意事项

1. Don't put the extra tension to the product. Because the down-lead connection uses the hot pressing combination, do not use extra tension.

不要对产品施加额外的拉力。因为引线连接采用的是热压组合方式，所以不要使用额外的拉力。

2. Installation combined, please don't pull FPC heavily, because pull heavily will make the FPC separated from product.

安装组合时，请不要重拉 FPC，因为重拉将使 FPC 从产品上剥离。

3. Please don't paste or install other items on the FPC. Such as: pasting a layer FILM or metal plate on the FPC, Because these add-ons will impose an extra pressure on the top of FPC, thus leading to the inner side of FPC become flexible.

请不要在 FPC 上粘贴或安装其它物品。如：在 FPC 上贴一层 FILM 或金属板，因为这些附加物会对 FPC 顶部施加一个额外的压力，从而导致 FPC 内侧松动

4. If there is an aeration slot, when you design the product structure you need notice accessories of a product, they can't have any liquid and powder.

如有通气槽，请在设计产品结构时，注意产品附件不能有液体物和粉状物。

5. In order not to make the T/P surface pressure, so the distance between the cabinet and our company's T/P combination clearance shall be maintained 0.2mm-0.5mm.

为了不使 T/P 表面受压，因此机壳与我公司 T/P 组合间隙须保持在 0.2mm-0.5mm 的范围内。

6. As it will make serious damage on the transparent electrodes to operate in the area of the other than the drive area, we suggest that the design cabinet shall cover the edge of the drive area for avoiding operating outside the area which would reduce machine life,

我们建议设计机壳应覆盖驱动区的边缘，以免对驱动区外区进行操作,减少机器寿命，因为驱动区外区域操作会严重损伤透明电极。

## 10.4 Operation Cautions 操作过程中的注意事项

1. Do not use sharp objects touch. Please with finger or conductive pen touch

请勿用尖锐物体触摸，请采用手指或导电性笔触摸。

2. After long-term use, please use alcohol to remove product surface uncleanness.

长期使用之后，请用酒精去除产品表面的污秽。

## 11 Packing 包装

### Bill of Material 物料清单 (Pallet not included 托盘不包含在内)



**PE bag**  
PE袋



**Foam packing layer**  
泡沫固定板



**Paper pad**  
纸板



**Paper corner protector**  
护角板



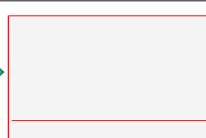
**Carton**  
纸箱



**Packing tape**  
封箱胶带卷



Prepare a touch panel  
准备触摸板



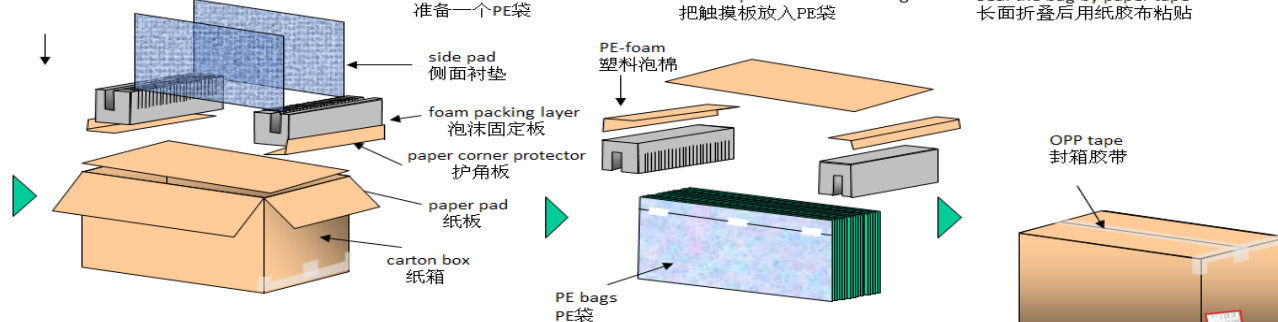
Prepare a PE bag  
准备一个PE袋



Put a touch panel into the PE bag  
把触摸板放入PE袋



seal the bag by paper tape  
长面折叠后用纸胶布粘贴



1. Seal the bottom of carton (in H-taping)  
箱子底部粘贴
2. Put a paper pad in the bottom of box  
放入纸板
3. Put the paper corner protectors in two sides of the bottom.  
角板放入下端侧面
4. Put the foam packing layers on the corner protectors.  
角板上方放入固定板

1. Fix the touch panels into the foam packing layers  
固定板中嵌入触摸板
2. Put another two foam packing layers over the touch panels and fix them well.  
嵌入上部固定板及中间固定板
3. Put another two corner protectors over the foam packing layers.  
固定板侧面放入角板
4. Put foam pads in front and back side of carton.  
侧面放入塑料泡棉

1. Seal the top of carton by OPP tape.  
上方用胶带粘住
2. Put stickers on each side of carton.  
箱子粘上胶带后侧面贴上标签

## 12. 图纸 Drawings:

