

PRODUCT SPECIFICATION

产 品 规 格 书

Product Name/品名: Touch Display

IVT PN /IVT 机种名: 101P01-1A4

Customer/客户名称: Avnet

Customer P/N/客户料号: IVA-101O1-NC9509-G020
SAP: YIVIVA101O1NC950!B

Date / 日期: 2023-08-10

SPEC Version: V1.2

iVTouch approve/维业达确认:

Approved by /承认	Checked by /审核	Designed by /设计

Customer approve/客户确认:

Approved by /承认	DATE /日期

苏州维业达科技有限公司
Suzhou iVTouch Co.,Ltd
苏州工业园区新昌路 68 号
No.68 Xinchang Road , SIP, Suzhou



History of Version 变更记录

Date 日期	Ver.版本	Description 描述	Page 页码	Design by 变更人员
2023-04-17	1.0	For the first time to issue/首次发行	All	Sophia
2023-07-28	1.1	Change TFT PN 原型号液晶模组停产， 更换液晶型号。	All	Sophia
2023-08-10	1.2	1) Update item 2. OT from -20°C~+70°C to -30°C ~+80°C 2) Update drawing	P4 P21	Sophia

Contents 目录

1. FEATURES 基本信息	4
2. General Specification 基本参数	4
3. Structure drawing 产品结构	4
4. Touch Panel Electrical Characteristics (Ta = 25℃) 电气参数	5
5. TFT Electrical characteristics 液晶模组电性参数	5
6. Reliability 信赖性	8
7. Durability 机械性能	8
8. ESD TEST 静电测试	8
9. Finally product Inspection 成品检验	9
9.1 Inspection method definition 检验方法定义	9
9.2 Optical inspection view and inspection time 外观检验角度和时间	10
9.3 Display Inspection 液晶显示检验	11
9.4 Check the TFT position 液晶位置检验	11
9.5 Touch panel Function check 功能检查	11
9.6 Defect criteria 判定标准	12
10. Precautions 注意事项	17
11. Label	19
12. Packaging 包装	20
13. Drawing 图档	20

1. FEATURES 基本信息

101P01 is an air bonded Touch/Display Stack with cover glass and TFT TCXD101IBLON-132 (Xinli Optronics Co.,Ltd). The display is air bonded to the cover glass laminated with SP-ITO Technology PCAP. Follow RoHS (2002/95/EC) and Reach.

The cover glass is chemical strength cover glass with organic black silk-print.

2. General Specification 基本参数

Item 项目		Contents 内容	Remark 备注
Glass	Glass Outline Dimension 玻璃外形尺寸	247mm*166 mm	
	Glass View Area 可视区	217.96 mm*136.6mm	
	Glass type玻璃材质	Chinese clear glass	
	Glass Thickness 玻璃厚度	2.0mm	
Touch	Touch panel Interface Type 触控接口	IIC and USB	
	Touch panel Structure type 结构类型	GFF (SP-ITO Film)	
	TP Driver IC 触控驱动芯片	SIS 9509	
	TP size (inch)尺寸 (英寸)	10.1 inch	
Display	Display resolution	1280*800	
	Pixel pitch (HxV)	0.1695*0.1695mm	
	Luminance	1000 cd/m2	
	Contrast ratio	800:1 (typ.)	
	Display color	16.7 Million	
	TFT interface	LVDS	
Touch Display	Weight	TBD	
	Operating temperature 工作温度	-30 °C ~ 80 °C	Note2
	Storage temperature 储存温度	-30 °C ~ 80 °C	Note2

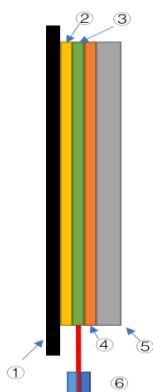
Note1: Regarding display technical features, please take Display Datasheet for your reference TCXD101IBLON-132.

液晶屏的更多技术参数, 请参考液晶屏规格书 TCXD101IBLON-132.

Note 2: Measured at LCD panel surface (including self-heat).

3. Structure drawing 产品结构

The Touch Display Module consists of following parts: 触控模组包括以下零部件



- ① China clear glass with organic black silk-print 国产清波机上常规黑色丝印
- ② OCA 透明光学胶
- ③ SP-ITO膜导电SP-ITO 膜
- ④ Air bonding material 框贴材料
- ⑤ LCD Panel 液晶显示模组
- ⑥ Controller(with Chip) 控制板 (含有芯片的FPC)

4. Touch Panel Electrical Characteristics (Ta = 25℃) 电气参数

Item 项目	Specification 规格	Remark 备注
Touch points 触摸点数	10 点触摸	
Linearity/线性度	<2%	
Operation voltage 工作电压	DC5V	
Response Time 反应时间	<10ms	

5. TFT Electrical characteristics 液晶模组电性参数

5.1 Absolute Maximum Ratings

Table 1 Electrical & Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Logic Supply Voltage	V _{DD}	-0.3	4	V	
Logic Input Signal Voltage	V _{Signal}	-0.3	4	V	
Operating Temperature	T _{gs}	-30	80	°C	(Front and rear surface)
Storage Temperature	T _a	-30	80	°C	

Note (1) All the parameters specified in the table are absolute maximum rating values that may cause faulty operation or unrecoverable damage, if exceeded. It is recommended to follow the typical value.

Note (2) All the contents of electro-optical specifications and display fineness are guaranteed under Normal Conditions. All the display fineness should be inspected under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55±10%RH.

Note (3) Unpredictable results may occur when it was used in extreme conditions. Ta= Ambient Temperature, Tgs= Glass Surface Temperature. All the display fineness should be inspected under normal conditions.

Note (4) Temperature and relative humidity range are shown in the figure below. Wet bulb temperature should be lower than 57.8℃, and no condensation of water. Besides, protect the open-cell from static electricity.

5.2 Optical Characteristics

The optical characteristics are measured under stable conditions as following notes.

Table 2 Optical Characteristics

Item	Conditions	Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR≥10°)	Horizontal	θ x+	75	85	-	(1),(2),(3),(4),(8)
		θ x-	75	85	-	
	Vertical	θ y+	75	85	-	
		θ y-	75	85	-	
Contrast Ratio	Center	600	800	-	-	(1),(2),(4),(8) θx=θy=0°
Response Time	Rising + Falling	-	25	50	ms	(1),(2),(5),(8) θx=θy=0°
Color Chromaticity (CIE1931)	Red x	Typ. -0.03	TBD	Typ. +0.03	-	(1),(2),(3),(8) θx=θy=0°
	Red y		TBD		-	
	Green x		TBD		-	
	Green y		TBD		-	
	Blue x		TBD		-	
	Blue y		TBD		-	
	White x		TBD		-	
	White y		TBD		-	
NTSC	-	42	45	-	%	(1),(2),(3),(8) θx=θy=0°
White Luminance	Center	800	1000	-	cd/m2	(1),(2),(6),(8) θx=θy=0°
Luminance Uniformity	9 Points	(70)	(75)	-	%	(1),(2),(7),(8) θx=θy=0°

5.2 Interface Connector

Table 3 Signal Connector Type

Item	Description
Manufacturer / Type	IPEX / 20455-040E-66

Pin #	Signal Name	Description	Remarks
1	NC	No Connection	-
2	VDD	Power supply	-
3	VDD	Power supply	-
4	VDD_EDID	VDD_EDID	-
5	SCL_EDID	SCL_EDID	-
6	SDA_EDID	SDA_EDID	-
7	NC	No Connection	-
8	LV0N	-LVDS Differential Data Input	-
9	LV0P	+LVDS Differential Data Input	-
10	GND	Ground	-
11	LV1N	-LVDS Differential Data Input	-
12	LV1P	+LVDS Differential Data Input	-
13	GND	Ground	-
14	LV2N	-LVDS Differential Data Input	-
15	LV2P	+LVDS Differential Data Input	-
16	GND	Ground	-
17	LVCLKN	-LVDS Differential Clock Input	-
18	LVCLKP	+LVDS Differential Clock Input	-
19	GND	Ground	-
20	LV3N	-LVDS Differential Data Input	-
21	LV3P	+LVDS Differential Data Input	-
22	GND	Ground	-
23	NC	No Connection	-
24	NC	No Connection	-
25	NC	No Connection	-
26	NC	No Connection	-
27	NC	No Connection	-
28	NC	No Connection	-
29	NC	No Connection	-
30	NC	No Connection	-
31	NC	No Connection	-
32	NC	No Connection	-
33	NC	No Connection	-
34	NC	No Connection	-
35	BIST	LCD Panel Self Test Enable, When it is not used, please don't connect to GND, connecting to Normal High(3.3V) is recommended	Active Low(0V) Normal High (3.3V)
36	CSB	Serial communication enables. (For XINLI use only)	-
37	SCL	Serial communication clock input. (For XINLI use only)	-
38	SDA	Serial communication data input. (For XINLI use only)	-
39	SCL_I2C	Serial communication clock input. (For XINLI use only)	-
40	SDA_I2C	Serial communication data input. (For XINLI use only)	-

Backlight interface

Pin #	Signal Name	Description	Remarks
1	LED_GND	LED Ground	-
2	LED_VCC	LED Power supply	-
3	LED_PWM	PWM Dimming Control Input.	-
4	LED_EN	LED Chip Enable	-

5.3 Input Power Specifications

Input power specifications are as follows.

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
System Power Supply							
LCD Drive Voltage (Logic)		VDD	3.0	3.3	3.6	V	(1),(2),(3)
VDD Current	White pattern	I _{DD}	-	-	0.31	A	(1),(4)
VDD Power Consumption		P _{DD}	-	-	1.0	W	
Rush Current		I _{Rush}	-	-	1.5	A	(1),(5)
Allowable Logic/LCD Drive Ripple Voltage		V _{VDD-RP}	-	-	300	mV	(1)

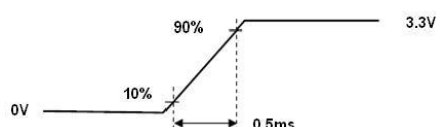
Note (1) All of the specifications are guaranteed under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55±10%RH.

Note (2) All of the absolute maximum ratings specified in the table, if exceeded, may cause faulty operation or unrecoverable damage. It is recommended to follow the typical value.

Note (3) The specified VDD current and power consumption are measured under the VDD = 3.3 V, FV = 60 Hz condition and white pattern.

Note (4) The figure below is the measuring condition of VDD. Rush current can be measured when TRUSH is 0.5 ms.

Figure 13 VDD Rising Time



5.4 Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
LED VCC Voltage	Vf	5	12	24	V	
Number of LED	-	40			pcs	-
LED Forward Voltage	-	2.8	3	3.6	V	-
LED Forward Current	-	-	20mA	-	mA	-
LED Enable	-	0	-	3.3	V	-
Input PWM Frequency	-	0	-	3.3	V	-
PWM Dimming Frequency	fpwm	0.1	-	20	KHz	
LED life-span	-	-	(30000)	-	Hrs	-

6. Reliability 信赖性

Item 项目	Specifications 规格	Judgment 判定
High Temperature (Operation) 高温测试 (工作状态)	80°C, 240hrs, Placed in room temperature 24h, the sample was tested. Display data is black	1) no display malfunctions 无显示故障 2) No touch failure 无触控异常
Low Temperature Storage 低温存储	-30°C, 240hrs, Placed in room temperature 24h, the sample was tested. Display data is black	
High Temperature Storage 高温存储	80°C, 240hrs, Placed in room temperature 24h, the sample was tested. Display data is black	
High Temperature and humidity (Operation) 高温高湿测试 (工作状态)	60°C/90% RH, 240hrs, normalized for 2 hrs Display data is black	
Thermal Shock (Non Operation) 冷热冲击	-20 ~ 70°C, 30 min/cycle, Total 100 Cycles, Start with cold temperature and end with high temperature	

Note (1) A sample can only have one test. Outward appearance, image quality and optical data can only be checked at normal conditions according to the XINLI document before reliable test. Only check the function of the open-cell after reliability test.

Note (2) The setting of electrical parameters should follow the typical value before reliability test.

Note (3) During the test, it is unacceptable to have condensate water remains. Besides, protect the open-cell from static electricity.

Note (4) The sample must be released for 24 hours under normal conditions before judging. Furthermore, all the judgment must be made under normal conditions. Normal conditions are defined as follow: Temperature: 25°C, Humidity: 55±10%RH. Ta= Ambient Temperature, Tgs= Glass Surface Temperature.

Note (5) It could be regarded as pass, when the open-cell recovers from function fault caused by ESD after resetting.

7. Durability 机械性能

Item 项目	Specification 规格
Hitting life 触击寿命	Use R0.8 written 150 g, 2 times/s, tapping 200 million times back and forth (calculate) 用R0.8笔头施加150g力, 2次/s, 触击2亿次 (来回算两次)
Hardness 表面硬度	≥7H
Ball Drop Test 落球测试	Steel ball 500g, 5 Drop Points at glass center and four corners, Height 70cm 钢球500g, 中心及四角5个落点, 高度70cm
Package drop 包装跌落测试	Drops on one corner, three edges, and six sides; Drop height: 0.5m, without damage 一角三棱六面包装, 从50cm高度跌落无损伤

8. ESD TEST 静电测试

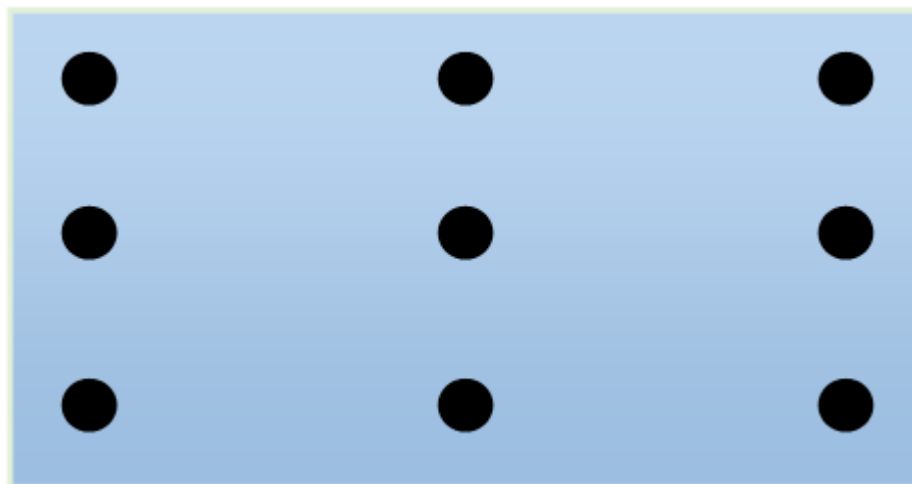
Condition: Temperature: 22°±3°, humidity: 55%RH±10%

There are 9 test points as showed below. For each point the user test it 3 times with 5 second gap between one test and the next one. Discharge capacitance value is 330pf and discharge resistance 330phm

条件: 温度: 22°±3°, 湿度: 55%RH±10%

如下图, 产品上共有9个测试点, 每个测试点测试3次, 每次间隔5秒。测试时放电电容容值330PF, 放电阻值为330 欧姆。

Discharge position 放电位置	Discharge way 放电方式	Discharge voltage 放电电压 (KV)	Test requirements 试验要求
Touch Panel glass top side surface 触控面板玻璃盖板表面	Contact charge 接触放电	±8KV, Times	Mentioned below ESD SEPC
	Air charge 空气放电	±15KV, Times	



Test Points

ESD SPEC: 静电测试判定标准

Item 项目	Issue 问题点	SPEC 判定
During ESD test 静电测试过程中	Broken line, Jitter 断线, 抖动	Allowed 允许
	Ghost touches 跳点	Not allowed 不允许
After ESD test 静电测试过程后	Broken line, Jitter 断线, 抖动	Not allowed 不允许
	Ghost touches 跳点	Not allowed 不允许

9. Finally product Inspection 成品检验

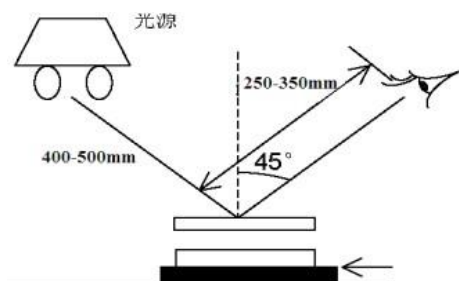
Finally product=Glass+ Mesh Touch sensor +LCD as one bundle

成品=玻璃盖板+金属网格触控膜+液晶模组

9.1 Inspection method definition 检验方法定义

9.1.1 Inspection method : A

Picture 1



检查方法A / Inspection Method A:

检验条件 / Conditions

检验环境亮度: 800~1200 Lux

Light Condition: 800~1200 Lux

人眼距离产品(表面): 30cm ± 5cm

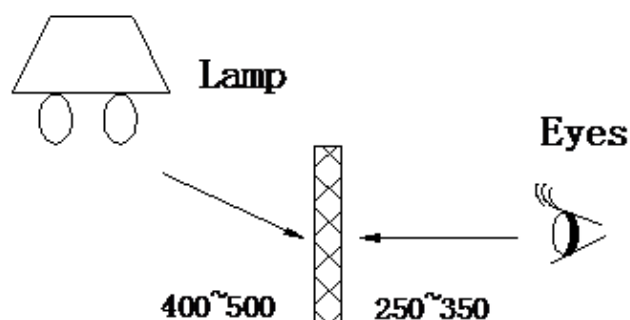
Distance between eyes and the test object (front of touch screen) : 30cm ± 5cm

检验时间: 25s ± 5s

Inspection time: 25s ± 5s

Touch display switch off 液晶模组不点亮

9.1.2 Inspection method : B



检查方法B / Inspection Method B:

检验条件 / Conditions

检验环境亮度: 800~1200 Lux

Light Condition: 800~1200 Lux

人眼距离产品(表面): 30cm±5cm

Distance between eyes and the test object (front of touch screen) : 30cm±5cm

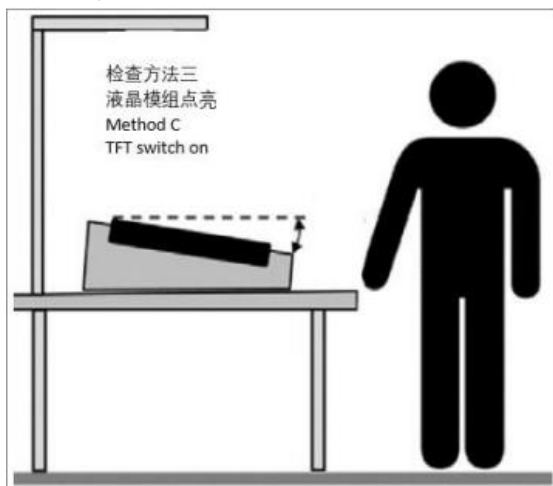
检验时间: 10s±5s

Inspection time: 10s±5s

Touch display switch off 液晶模组不点亮

Picture 2

9.1.3 Inspection method : C



检查方法C / Inspection Method C:

检验条件 / Conditions

检验环境亮度: 液晶模组表面亮度 60 Lux (暗室)

TFT surface light: 60 Lux

人眼距离产品(表面): 30cm±5cm

Distance between eyes and the test object (front of touch screen) : 30cm±5cm

检验时间: 15s±5s

Inspection time: 15s±5s

Touch display switch on and switch off

液晶模组点亮和关闭状态

9.2 Optical inspection view and inspection time 外观检验角度和时间

9.2.1 Inspection view/检验视角:

Vertical rotating 45 degrees from top to bottom, from left to right horizontally rotating 45

Degrees

垂直旋转±45° (由上到下), 水平旋转±45° (由左到右)

9.2.2 Inspection time/检验时间:

Top side will be inspected for 25 s , then change to bottom side. Bottom side will be inspected for 25 s.

Then change to side view inspected for 5s~10 s;

检验时间: 先检查正面, 正面检查时间 25 秒, 在检查背面, 背面检查时间 25 秒。最后检查四周边, 检查时间 5~10 秒;

9.2.3 Inspection frequency: 100% 检查频率: 100%

9.3 Display Inspection 液晶显示检验

9.3.1 Temperature/温度: $22 \pm 3^{\circ}\text{C}$; humidity/湿度:

$60\% \pm 10\% \text{RH}$;

9.3.2 Inspection method: C 检验方法: C

9.3.3 Inspection time: 检验时间

Switch on TFT , with white /dark/red/green/blue each color 10s; 50s total.

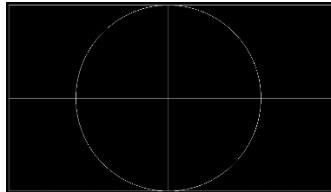
检验时间: 10 s (白色/黑色/红色/绿色/蓝色画面各 5 秒), 共 50 秒

9.4 Check the TFT position 液晶位置检验

液晶位置度检查, 使用液晶位置度检查软件 use "TFT_INSPECTION.exe" software



TFT_INSPECTION.
exe.exe

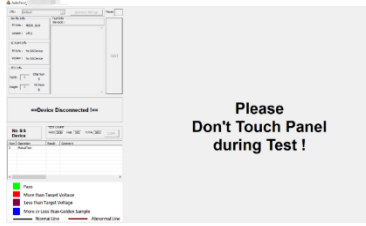
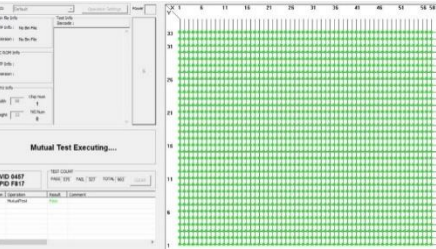
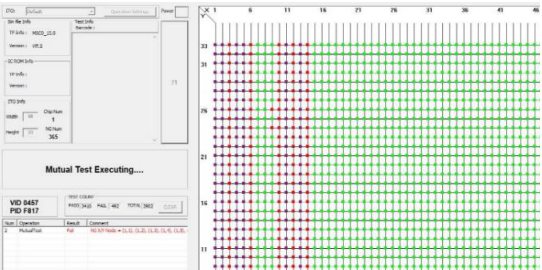


This is the ICON of the used SW to check the TFT position. This SW will be used also to test Black, white, red, blue, green background

9.5 Touch panel Function check 功能检查

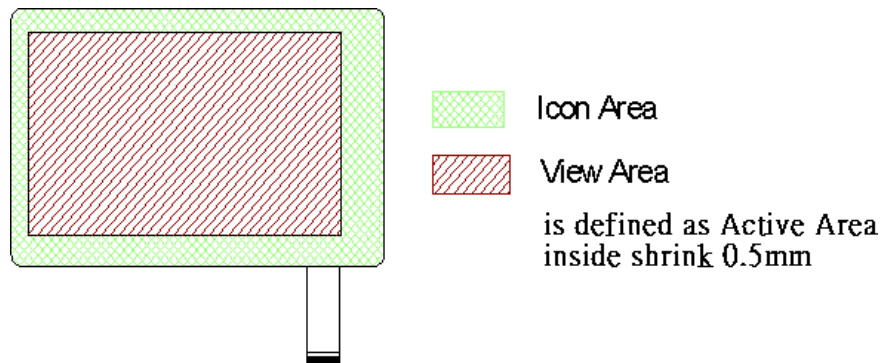
9.5.1 Inspection frequency: 100%

9.5.2 Function test Tool: SIS Auto-tool, picture as below

Steps	Reference picture	Note
connect FPC to laptop and open the SIS-Auto test tool, press "Test" button.		
If Touch panel function is ok, picture show as below "Pass"		
If Touch panel function is NG , will show "Fail" picture		

9.6 Defect criteria 判定标准

9.6.1 Terms Definition 定义



9.6.2 Appearance Specifications 外观判定标准

9.6.2.1 ICON Area Appearance Inspection Criteria 印刷区域判定标准

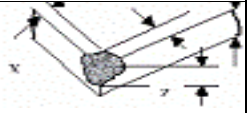
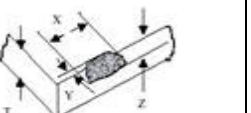
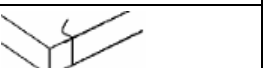
检验方法inspection method : refer to 9.1.1,9.1.2

Items	Conditions	Inspection Criteria	Method
Light Transparent Hole/Light Leakage 印刷针孔	TL/RL	Within 0.3mm of printing outer border: 从玻璃外边缘往里0.3mm 范围内 $D \leq 0.2\text{mm}$, ignore; $D > 0.2\text{mm}$, not allowed; Without 0.3mm of printing outer border: 从玻璃外边缘往里0.3mm 范围外 $D \leq 0.1\text{mm}$, ignore; $D > 0.1\text{mm}$, not allowed	Eye view, dot /wire gauge
Printing Saw edge 印刷锯齿	TL	Follow Glass VA dot-like and Linear defects SPEC. 按照可视区域点状，线状不良管控。	Eye view, dot /wire gauge
Ink Off 油墨脱落	TL	not allowed 不允许	Eye view
Stain and Dirty Mark 脏污、污迹	RL	* Contamination cannot be cleaned by soft cloth and alcohol, not Allowed; the non-cleanable stain should be inspected as "Dot-like Defects". 无尘布或者酒精无法擦拭的脏污不可有。不可擦拭脏污，按照点状不良管控。 * Contamination can be cleaned by soft cloth and alcohol, Accept; but if the ratio of such contamination defected products is more than 10% of all the inspected products, not allowed; 可擦拭脏污，可接受，但是比例不可超过整批产品的10%。	Eye view
Linear Particle 线状不良	RL	Refer to the view area Dot-like Defects 参考可视区线状不良管控标准	Eye view, dot /wire gauge
Dot-like Defects 点状不良	RL	Refer to the view area Dot-like Defects 参考可视区点状不良管控标准	Eye view, dot /wire gauge

9.6.2.2 View Area and other Area Appearance Inspection Criteria (Not TFT defect)

可视区域以及其他区域外观检验规范(非液晶模组)

检验方法inspection method : refer to 9.1.1 , 9.1.3

Items	Conditions	Inspection Criteria	Method
Dot-like Defects 点状不良	RL	$D \leq 0.15\text{mm}$, ignore; $0.15\text{mm} < D \leq 0.2\text{mm}$, $N \leq 5$ $0.2\text{mm} < D \leq 0.4\text{mm}$, $N \leq 2$, accept $D > 0.4\text{mm}$, not allowed	Eye view, Dot/ wire gauge
Glass Dent Bubble 玻璃的平凹, 气泡	RL	$D \leq 0.1\text{mm}$, ignore; $0.1\text{mm} < D \leq 0.2\text{mm}$, $N \leq 4$, accept $D > 0.2\text{mm}$, not allowed	Eye view, dot /wire gauge
Linear Particle 线状不良	RL	$W \leq 0.03\text{mm}$, $L \leq 10\text{mm}$, ignore; $0.03\text{mm} < W \leq 0.05\text{mm}$, $L \leq 10\text{mm}$, $N \leq 4$, accept $0.05\text{mm} < W \leq 0.08\text{mm}$, $L \leq 10\text{mm}$, $N \leq 2$, accept $W > 0.08\text{mm}$ or $L > 10\text{mm}$, not allowed	Eye view, dot /wire gauge
Scratch (sensor/glass) 玻璃或sensor上的划伤	RL	$W \leq 0.03\text{mm}$, $L \leq 10\text{mm}$, ignore; $0.03\text{mm} < W \leq 0.08\text{mm}$, $L \leq 10\text{mm}$, $N \leq 2$, accept $W > 0.08\text{mm}$ or $L > 10\text{mm}$, not allowed Inductive scratch, not allowed 有感刮伤不允许	Eye view, dot /wire gauge
Corner Defect、 Edge Defect 缺角、崩边	RL	“X” for Length, “Y” for Width, “Z” for Thickness, “T” for Total thickness of the glass; X: 长度, Y: 宽度, Z: 厚度, T: 玻璃总厚度; Corner defect/ 崩角: $X \leq 1.5\text{mm}$, $Y \leq 1\text{mm}$, $Z \leq 1\text{GT}$, and do not hurt line;	
		warped corner/翘角: $X < 1.5\text{mm}$, $Y < 1\text{mm}$, $Z < \text{GT}$, except the exterior surface; Edge Defect /崩边: $X \leq 2\text{mm}$, $Y \leq 1\text{mm}$, $Z \leq \text{GT}$, and do not hurt line;	
Glass Crack玻璃 裂痕	RL	Not allowed;	
FPC	RL	Bonding offset: FPC and sensor pin bonding about migration < pin width 1/2;(FPC与Sensor Pin bonding左右偏移 < Pin 宽的 1/2;)	
	RL	FPC surface are not allowed to have: crack, crease, with glue etc.表面: 破裂、折痕、沾胶, 不允许;	
	RL	TFT all connectors have to be installed correctly 液晶模组上所有连接, 需要准确无误	
Gold finger 金手指	RL	Glue residue, broken, oxidation, smudgy, does not allow; 残胶、折伤、氧化、脏污, 不允许;	
Dirty/脏污	RL	Flake smudgy does not allow, bad dot the dirt of the specifications of the reference point;片状脏污不允许, 点状脏污不良参照点的规格;	
Total Defects 总缺点数	The defects were ignore, it is not count here. 忽略不计的不良, 不做统计。 Total 7 defects Max. 不超过7个缺点。		

9.6.2.3 Display Specifications 液晶模组显示检验标准

Inspection method: 9.1.3 C 检验方法: 9.1.3 C

Symptom	Judgment criteria	Note
Bright Dots	0	Note 1
Dark Dots	10	Note 1
Distance between Bright - Bright	$\geq 15\text{mm}$	Note2
Distance between Dark- dark	$\geq 5\text{mm}$	Note2
Distance between Bright - Dark	$\geq 5\text{mm}$	Note2
Total Bright and Dark Dots	10	
Line defect	Not Allowed	
No Function	Not Allowed	
Mura	ND5% (50% Gray)	Note3

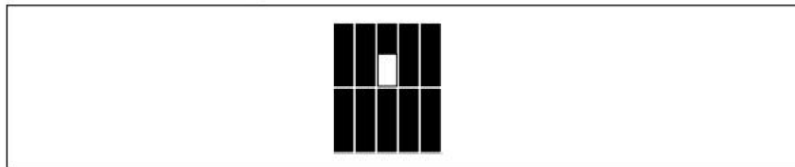
Note 1. Bright, Dark dot defect description

-Less than 50% dot are ignored. When it is densely distributed, the judgment standard:

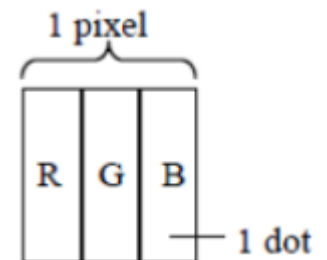
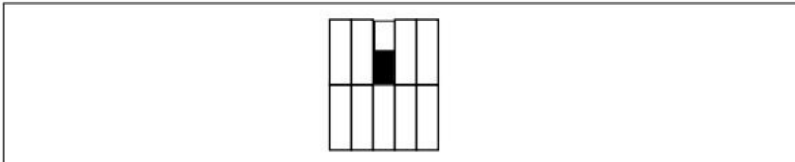
In a circle of R=5mm, N≤5 is allowed.

-Visible under: ND5%

-bright area is more than 50% of one dot

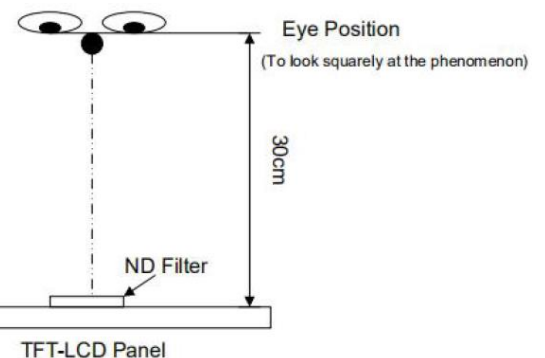
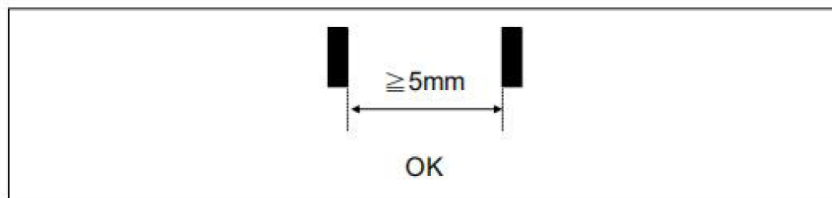


- dark area is more than 50% of one dot



Note 2. Minimum distance between dot defects

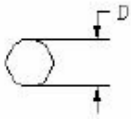
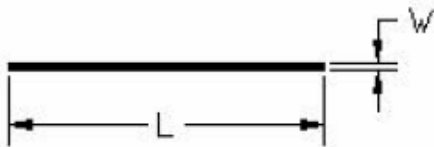
-Dark dot to Dark dot, Bright dot to Bright dot



Note 3. Bright dot, mura and leak are defined through transmission ND Filter as following.

9.6.2.4 TFT appearance Specification 液晶模组外观检验标准

Inspection method: 9.1.1 A , 检验方法: 9.1.1 A

Defect Type	Specification Size		Count(N)
Dot Shape (Particle、Scratch and Bubbles in active area) 	$D \leq 0.2 \text{ mm}$		Ignored
	$0.2\text{mm} < D \leq 0.5\text{mm}$		$N \leq 5$
	$D > 0.5\text{mm}$		$N=0$
Backlight light leakage	visible through 5% ND filter	$L \leq 10 \text{ mm}$	Ignored
		$10 < L \leq 20 \text{ mm}$	$N \leq 3$
		$L > 20 \text{ mm}$	$N=0$
	Invisible through 5% ND filter		Ignored
Line Shape (Particles、Scratch、Lint and Bubbles in active area) 	$W \leq 0.05 \text{ mm}$ 且 $L \leq 1.0 \text{ mm}$		Ignored
	$0.05\text{mm} < W \leq 0.2\text{mm}$ 且 $1 \leq L \leq 5.0 \text{ mm}$		$N \leq 4$
	$0.2\text{mm} < W$ or $L > 5 \text{ mm}$		$N=0$

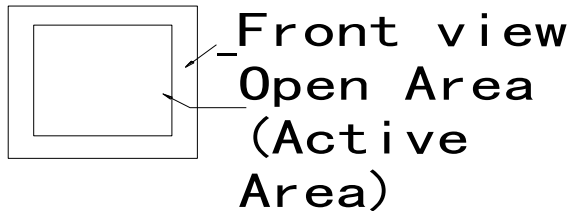
9.6.2.5 TFT Characteristics

The following items are neither defects nor failures.

- ① Characteristics of the LCD (such as response time, luminance, color uniformity and so on) may be changed depending on ambient temperature. If the product is stored under condition of low temperature for a long time, it may cause display Mura. In this case, the product should be operated after enough time being left under condition of operating temperature.
- ② Display Mura, flickering, vertical steamship or tiny spots may be observed depending on display patterns.
- ③ Don not display the fixed pattern for a long time because it may cause image sticking. Use a screen saver, If the fixed pattern is displayed on the screen.
- ④ The display color may be changed depending on viewing angle because of the use of condenser sheet in the backlight.
- ⑤ Optical characteristics may be changed depending on input signal timings.

Note :

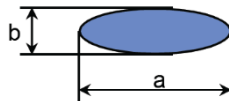
- 1) If we cannot see any spot or line in the appropriate operating condition of panel, it is Acceptable.
- 2) The foreign materials that can be blown out by air and washed out by wet cleaning are not regarded as a defect.
- 3) Available Inspection Area is shown as "Active Area" of the picture.



- 4) If glass with AR coat, then ignore the AR white dots defects
- 5) Defects of Back side, located outside the View Area: Appearance defects, such as Scratch, Foreign Object, Stain and Dirty mark, on the backside of a Module do not lead to performance failure, Accept.
- 6) W=Width; L=Length



7) Definition

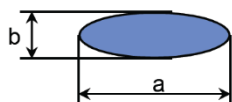
Dot-like Defects: $a \leq 2b$ Linear : $a > 2b$ $D = (a+b)/2$ 

注意:

- 1) 如果在适当的操作面板的条件下，我们不能看到任何点或线，它是可以接受的。
- 2) 异物通过风不能吹掉的，且无尘布也不能擦拭掉的，视为不良。
- 3) 可视区检查部位在图中标示为“活动区域”。
- 4) 如果玻璃有进行 AR 处理，则 AR 镀层的白点不良忽略
- 5) 产品背面外观不良，不影响产品性能以及使用，则允收
- 6) W=宽度；L=长度（线状不良测量方法）



7) 定义

点状缺点: $a \leq 2b$ 线状缺点: $a > 2b$ $D = (a+b)/2$ 

10. Precautions 注意事项

10.1 MEANING OF CAUTION SIGNS

The following caution signs have very important meaning. **Be sure to read "10.2 CAUTIONS" and "10.3 ATTENTIONS"!**



This sign has the meaning that a customer will be injured or the product will sustain damage if the customer practices wrong operations



This sign has the meaning that a customer will be injured if the customer practices wrong operations.

10.2 CAUTIONS



*** Do not shock and press the LCD panel and the backlight! There is a danger of breaking, because they are made of glass. (Shock: Equal to or no greater than 539m/s^2 and equal to or no greater than 11ms, Pressure: Equal to or no greater than 19.6 N ($\phi 16\text{mm}$ jig))**

10.3 ATTENTIONS

10.3.1 Handling of the product

- ① Take hold of both ends without touching the circuit board when the product (LCD module) is picked up from inner packing box to avoid broken down or misadjustment, because of stress tomounting parts on the circuit board.
- ② When the product is put on the table temporarily, display surface must be placed downward.
- ③ When handling the product, take the measures of electrostatic discharge with such as earth band, ionic shower and so on, because the product may be damaged by electrostatic.
- ④ The torque for product mounting screws must never exceed $0.230\text{N}\cdot\text{m}$. Higher torque might result in distortion of the bezel. And the length of product mounting screws must be $\leq 2.5\text{mm}$.
- ⑤ The product must be installed using mounting holes without undue stress such as bends or twist (See outline drawings). And do not add undue stress to any portion (such as bezel flat area). Bends or twist described above and undue stress to any portion may cause display Mura.
- ⑥ Do not press or rub on the sensitive product surface.
- ⑦ When cleaning the panel surface, wipe it with a soft dry cloth.

- ⑧ Do not push or pull the interface connectors while the product is working.
- ⑨ Usually liquid crystals don't leak through the breakage of glasses because of the surface tension of thin layer and the construction of LCD panel. But, if you contact with liquid crystal by any chance, please wash it away with soap and water.

10.3.2 Environment

- ① Do not operate or store in high temperature, high humidity, dewdrop atmosphere or corrosive gases. Keep the product in packing box with antistatic pouch in room temperature to avoid dusts and sunlight, when storing the product.
- ② In order to prevent dew condensation occurred by temperature difference, the product packing box must be opened after enough time being left under the environment of an unpacking room. Evaluate the storage time sufficiently because dew condensation is affected by the environmental temperature and humidity. (Recommended leaving time: 6 hours or more with the original packing state after a customer receives the package)
- ③ Do not operate in high magnetic field. If not, circuit boards may be broken.
- ④ This product is not designed as radiation hardened.

10.3.3 Characteristics

The following items are neither defects nor failures.

- ① Characteristics of the LCD (such as response time, luminance, color uniformity and so on) may be changed depending on ambient temperature. If the product is stored under condition of low temperature for a long time, it may cause display mura. In this case, the product should be operated after enough time being left under condition of operating temperature.
- ② Display Mura, flickering, vertical streams or tiny spots may be observed depending on display patterns.
- ③ Do not display the fixed pattern for a long time because it may cause image sticking. Use a screen saver, if the fixed pattern is displayed on the screen.
- ④ The display color may be changed depending on viewing angle because of the use of condenser sheet in the backlight.
- ⑤ Optical characteristics may be changed depending on input signal timings.

10.3.4 Others

- ① All GND, and VCC terminals should be used without any non-connected lines.
- ② Do not disassemble a product or adjust variable resistors.
- ③ The product should be kept in a dark, cool place under 10℃~30℃, 60% RH.
Direct sunlight exposure or piling should be avoided.
- ④ Use clean sacks or glove to prevent fingerprints and/or stains left on the panel.
Extra attention and carefulness should be taken while handling the glass edge.

- ⑤ Avoid high voltage and/or static charge, Holding the panel instead of the tail at all time.
- ⑥ Use neutral detergent or isopropyl alcohol on a clean soft cloth to clean the panel surface
Prevent using any kind of chemical solvent, acidic or alkali solution.
Excessive force or strain to the panel or tail is prohibited.
- ⑦ Touch the panel with your finger or stylus only to assure normal operation. Any sharp edged or hard objects are prohibited.
- ⑧ Operate the panel in a steady environment. Abrupt variation on temperature and humidity
may cause malfunction of the panel.
- ⑨ 12months guarantee after shipment in storage, shipment conditions described in this document.
- ⑩ Pack the product with the original shipping package, in order to avoid any damages during transportation, when returning the product to IVT.

11 Label

11.1 Label ①

Label ① : FPC label, Label size: 25*15mm, QR code size: Min 7*7mm



Customer PN:

IVA-101O1-NC9509-G020 type: Arial size: 7.1

101P0123280001 type: Arial size: 5.5

101: size; P01: project code ; 23: year; 28: week ;
0001: series number

11.2 Label ③ : on Flat box

Project name:	Touch Display
Customer Type:	
Customer SAP:	
Quantity:	
D/C:	

Label ④ : On Big box

Product Name:	Touch Display
Customer PN:	
Customer SAP:	
Country of origin:	
D/C:	
Order Number:	
Shipping Lots:	
Shipping Date:	
Quantity	
Box Number:	
Internal Number:	
Note:	
RoHS Compliant	

12. Packaging 包装

TBD

13. Drawing

[illegible]