LCD MODULE

SPECIFICATION

Model:	ALL-UE015WV-RB24-A021A
Version:	V1.0
Date:	2024.08.20

Customer Confirmation 客户确认

Approved by	Notes

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

请贵司在收到规格书的两周内，将签好字的规格书原件或者复印件寄回.如果没有返回，我司将会认为贵司已经默认接受产品规格书中的全部资料和规范.

VIEWE Confirmation 优奕确认

Prepared by	Reviewed by	Approved by

REVISION HISTORY 修改履历

Revision 版本号	Date 日期	Contents of Revision Change 修改内容	Remark 备注
V1.0	2024.08.20	Preliminary release	

TABLE of CONTENTS 目录

1. GENERAL INFORMATION 一般信息

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	AMOLED	-	-
Screen Size 屏幕尺寸	1.51	Inch	Diagonal
Resolution 分辨率	466*466	Dots	-
Module Power Consumption 模块功率	-	Watt	
Active Area 显示区尺寸	38.3052*38.3052	mm	-
Pixel pitch (W*H) 像素间距	82.2	mm	-
Module Size (W*H*D) 模组外形尺寸	44.3(W)*44.3(H)*2.405(D)	mm	
Driver IC 控制IC	CO5300AF-42	-	
Interface Mode 接口类型	QSPI	-	
Display mode 显示模式	Normal Black	-	
Luminance 亮度	450	cd/m^2	Typ.
Viewing Direction 视角	ALL	O'clock	-
Display Color 显示颜色	16.7M	Colors	24bits
LED life time LED灯寿命	-	-	

2. ABSOLUTE MAXIMUM RATINGS 绝对最大额定值

Item 项目	Symbol 符号	Min. 最小值	Max. 最大值	Unit 单位	Remark 备注
Power supply voltage	VCI	-0.3	5.5	V	Note1
Power supply voltage	IOVCC	-0.3	5.5	V	Note1
Operating temperature	T_{op}	-30	80	°C	Note1,2
Storage temperature	T_{st}	-40	70	°C	Note1,2
Humidity	H_{st}	10	90	%RH	Note1,3

(Ta=+25°C,GND=0V)

Note1:If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

注1：如果模块超过绝对最大额定值，则可能会永久损坏。此外，如果模块长时间以绝对最大额定值运行，可靠性可能会下降。

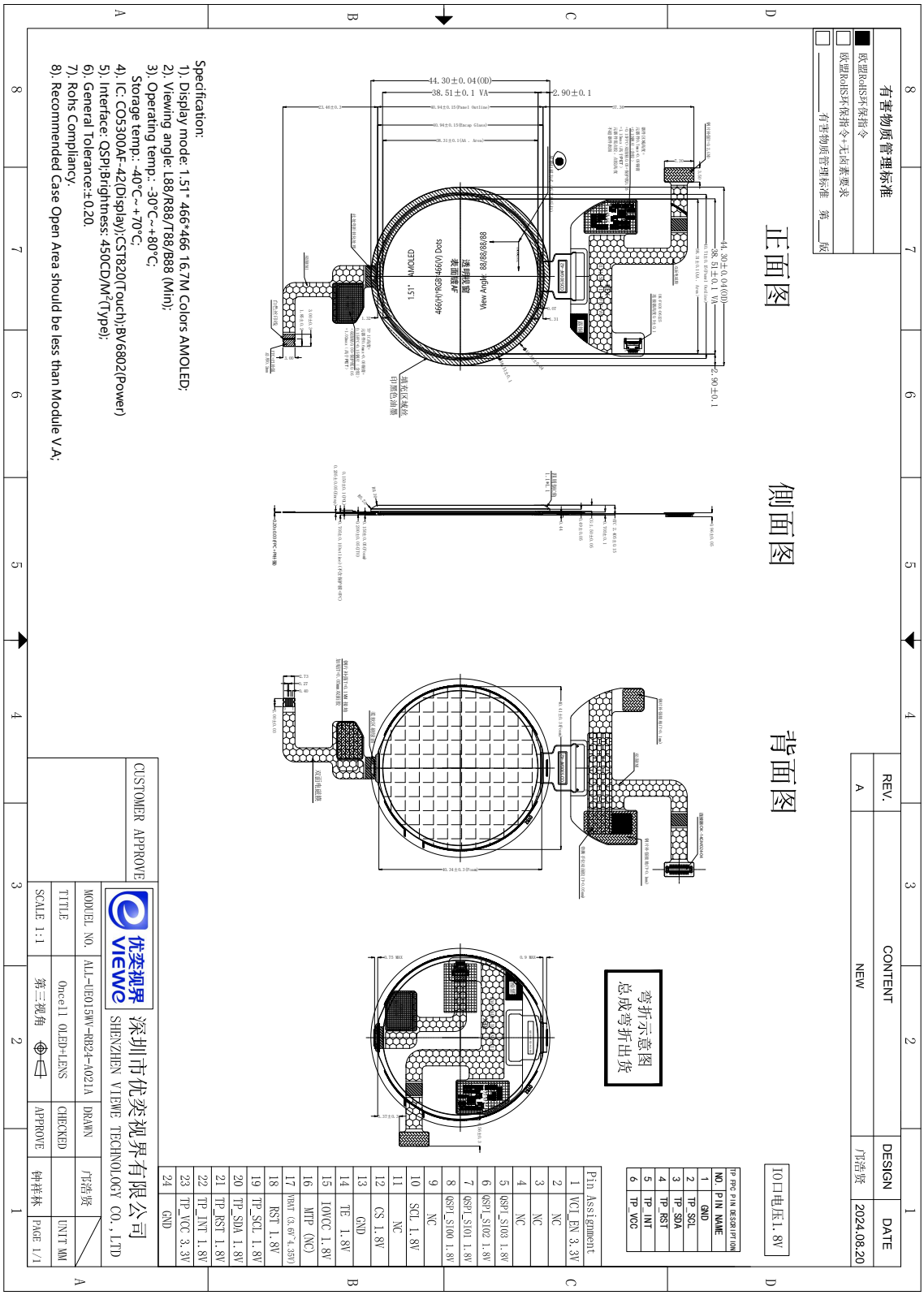
Note2: In case of temperature below 0℃,the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

注2：在温度低于0℃的情况下，液晶（LC）的响应时间会变慢，面板的颜色也会比正常颜色暗。

Note3: Temp. ≤ 60℃ , 90% RH MAX.
Temp. ＞60℃ , Absolute humidity shall be less than 90% RH.

注 3：温度≤60℃，最大相对湿度 90%。
温度＞60℃，绝对湿度应小于 90%RH。

3. MECHANICAL DRAWING 结构图纸



TP FPC PIN DESCRIPTION	
NO.	PIN NAME
1	GND
2	TP_SCL
3	TP_SDA
4	TP_RST
5	TP_INT
6	TP_VCC

Pin Assignment	
1	VCI_EN 3.3V
2	NC
3	NC
4	NC
5	QSPI_S103 1.8V
6	QSPI_S102 1.8V
7	QSPI_S101 1.8V
8	QSPI_S100 1.8V
9	NC
10	SCL 1.8V
11	NC
12	CS 1.8V
13	GND
14	TE 1.8V
15	IOVCC 1.8V
16	MTP (NC)
17	VBAT (3.6V~4.35V)
18	RST 1.8V
19	TP_SCL 1.8V
20	TP_SDA 1.8V
21	TP_RST 1.8V
22	TP_INT 1.8V
23	TP_VCC 3.3V
24	GND

4. I/O CONNECTION 输入/输出连接定义

Pin No. 序号	Symbol 符号	I/O	Description 描述
1	VCI_EN	P	Power supply
2	NC	-	-
3	NC	-	-
4	NC	-	
5	QSPI_SI03	I	QSPI Data3 input pin
6	QSPI_SI02	I	QSPI Data2 input pin
6	QSPI_SI01	I	QSPI Data1 input pin
7	QSPI_SI00	I/O	QSPI Data0 input pin
9	NC	-	-
10	SCL	I	SPI pclk input signal
11	NC	-	-
12	CS	I	Chip selection pin. Low-active
13	GND	P	Power Ground
14	TE	O	Tearing effect signal is used to synchronize MCU to frame memory
15	IOVCC	P	Power supply to the internal logic power regulator
16	MTP(NC）	-	-
17	VBAT	P	Power supply
18	RST	I	The signal will reset the LCM, Signal is active low.
19	TP_SCL	I	I2C clock signals for CTP
20	TP_SDA	I/O	I2C data signal for CTP
21	TP_RST	I	The signal will reset the CTP,Signal is active low

22	**TP_INT**	I	Interrupt signals for CTP
23	**TP_VCC**	P	Power supply for TP
24	**GND**	P	Power Ground

I：Input；O：Output；P：Power

5. ELECTRICAL CHARACTERISTICS 电气特性

5.1 Panel Driving Section 面板驱动部分

Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Power Supply Voltage	VCI_IN	2.7	3.3	3.6	V	-
Power Supply Voltage	IOVCC	1.65	1.8	3.3	mA	Note1
Logic Input High Voltage	V_{IH}	0.7IOVCC	-	IOVCC	V	-
Logic Input Low Voltage	V_{IL}	0	-	0.3IOVCC	V	-
Panel Power Consumption	P_{VDD}	-	-	-	Watt	Note1
Module Power Consumption	P_{LCM}	-	-	-	Watt	

(Ta=+25°C,GND=0V)

Note1:Measurement Conditions (Video Mode): Full Screen Red Pattern,VCI=3.3V,60Hz Refresh.

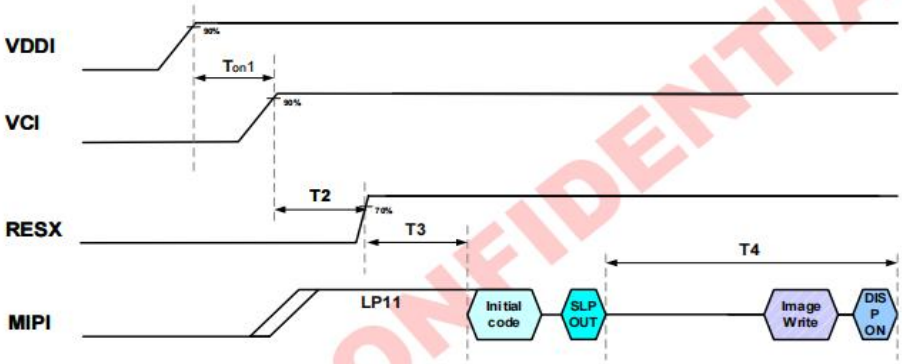
5.2 Power On/Off Sequence 电源开/关顺序

The power on sequence for different power input modes are shown below figures.

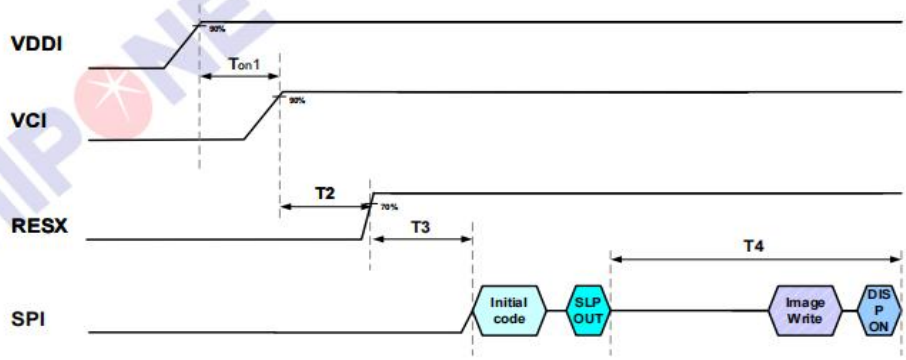
Power ON Sequence Timing

Symbol	Description	Value			Unit	Remark
		Min.	Typ.	Max.		
Ton1	VDDI on to VCI on delay	>0			us	
T2	VDDI on to valid to RESET high	10			ms	
T3	RESET high to first command	10			ms	
T4	Sleep-out command received to Display on command received.	60			ms	

The Power on sequence is shown as below.



MIPI Power ON Sequence



SPI Power ON Sequence

Note 1: *Unless otherwise specified, timings herein show cross point at 50% of signal/power level.*

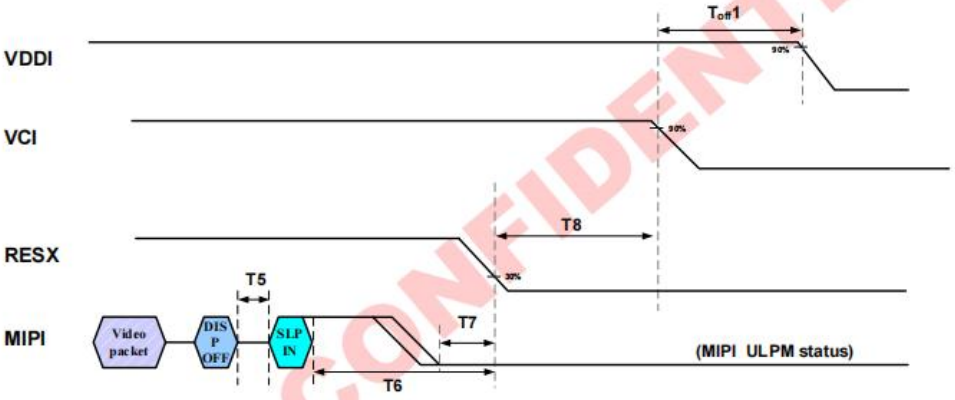
Note 2: *This power-on sequence is based on adding Schottky diode on VGL pin to ground.*

The power off sequence for different power input modes are shown below figures.

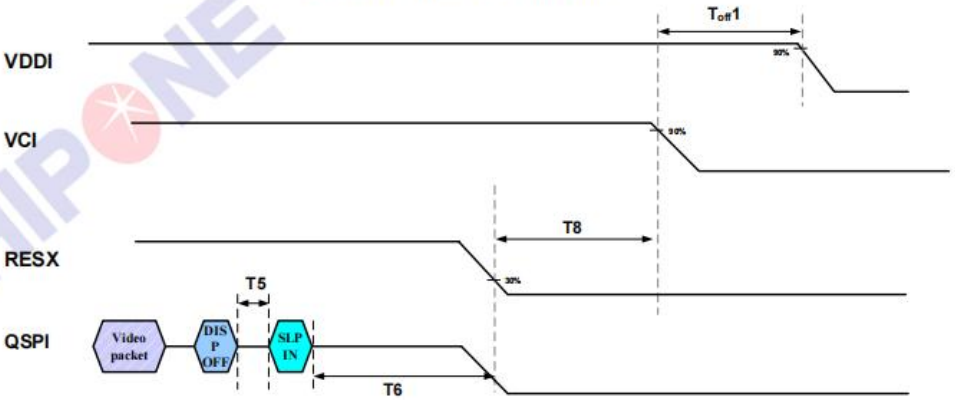
Power OFF Sequence Timing

Symbol	Description	Value			Unit	Remark
		Min.	Typ.	Max.		
Toff1	VCI off to VDDI off delay	>0			us	
T5	Display-off command received to Sleep-in command delay	>0			us	
T6	Sleep-in command received to valid to RESET low	83			ms	@60Hz
T7	MIPI ultra low power mode to valid to RESET low	0			us	
T8	RESET low to VCI off delay	0			us	

The power off sequence is shown as below:



MIPI Power off sequence



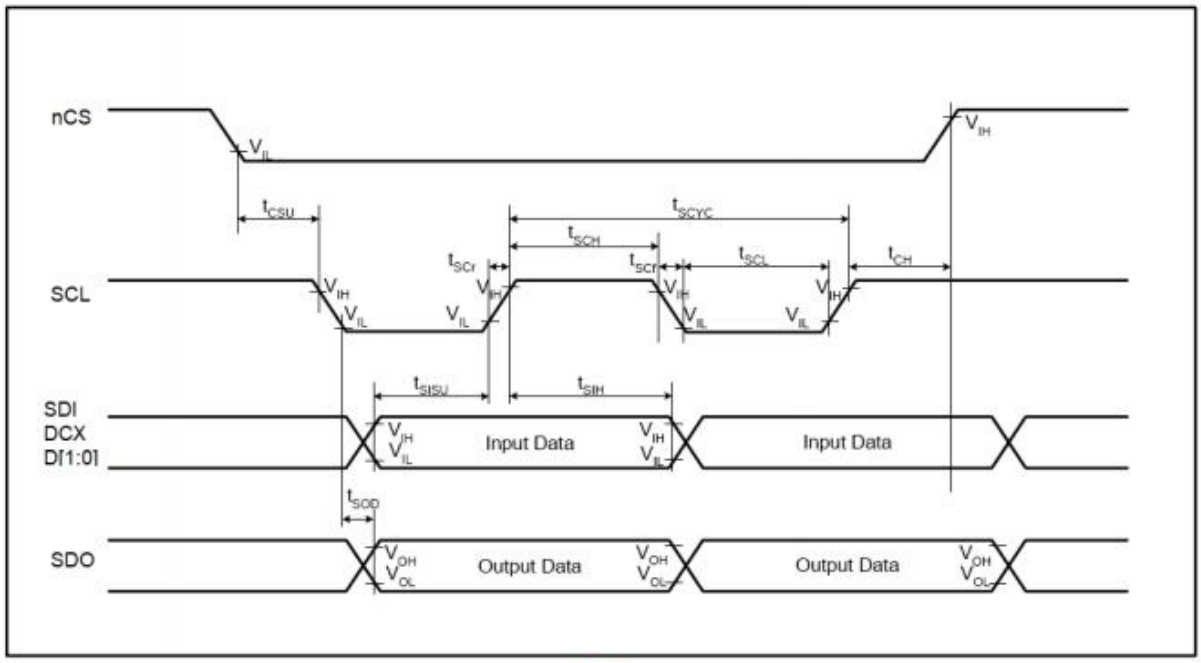
QSPI Power off sequence

Note 1: *Unless otherwise specified, timings herein show cross point at 50% of signal/power level.*

Note 2: *Keep VGH is equal to or larger than VCI during power off sequence.*

5.3 Timing Diagram 时序图

QSPI Interface characteristics



Parameter	Symbol	Conditions	Specification			Unit	Notes
			MIN	TYP	MAX		
SCL	T_{SCYC}	Clock cycle (Write)	20	-	-	ns	
	T_{SCYC}	Clock cycle (Read)	100		-	ns	
	T_{SCH}	Clock "H" pulse width (Write)	6.5	-	-	ns	
	T_{SCH}	Clock "H" pulse width (Read)	45	-	-	ns	
	T_{SCL}	Clock "L" pulse width (Write)	6.5	-	-	ns	
	T_{SCL}	Clock "L" pulse width (Read)	45	-	-	ns	
	T_{SCr}	Clock rise time	-	-	3.5	ns	
	T_{SCf}	Clock fall time	-	-	3.5	ns	
CSX	T_{CSU}	Chip select setup time	10	-	-	ns	
	T_{CH}	Chip select hold time	10	-	-	ns	
SDI DCX D[1:0]	T_{SISU}	Data input setup time	4	-	-	ns	
	T_{SIH}	Data input hold time	4	-	-	ns	
SDO	T_{SOD}	Data output setup time	-	-	45	ns	
	T_{SOH}	Data output hold time	5	-	-	ns	

***Note 1**: Logic high and low levels are specified as 20% and 80% of VDDI for Input signals.*

***Note 2**: Ta = -30 to 85 °C, VDDI=1.65V to 3.3V, VCI=2.7V to 3.6V, GND=0V*

***Note 3**: The max SCL sequence of 4-wire QSPI transferring RGB888, RGB666 and RGB555 is 50Mhz.*

6. OPTICAL CHARACTERISTICS 光学特性

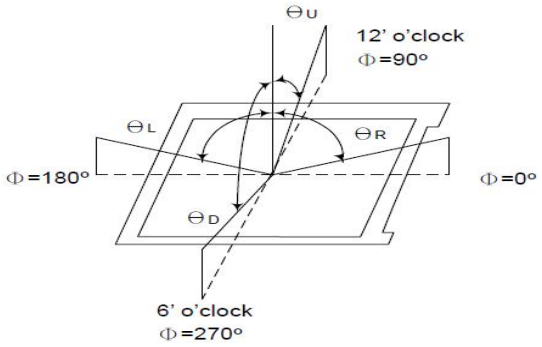
Parameter 参数	Symbol 符号	Condition 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Contrast Ratio 对比度	C/R	θ = 0°	10000	-	-	-	Note(4)
NTSC Ratio 色域	S	θ =0°	95	100	-	%	Note(7)
Luminance uniformity 亮度均匀度	U_W	θ =0°	90	-	-	%	Note(3)
Response Time 响应时间	T_R+ T_F	25 °C	-	-	2	ms	Note(2)
Color Coordination 色坐标	W_X	θ = 0° (Center) Normal viewing angle B/L On	-0.03	0.300	+0.03	NTSC (x,y)	Note(6)
	W_Y			0.310			
	R_X			0.680			
	R_Y			0.32			
	G_X			0.245			
	G_y			0.715			
	B_X			0.141			
	B_Y			0.045			
Viewing Angle 可视角度	θ_L	C/R>10	80	-	-	Degree	Note(1)
	θ_R		80	-	-		
	θ_U		80	-	-		
	θ_D		80	-	-		

Test Conditions 测试条件:

1. VDD=3.3V,, the ambient temperature is+25℃.
2. The test systems refer to Note 8.

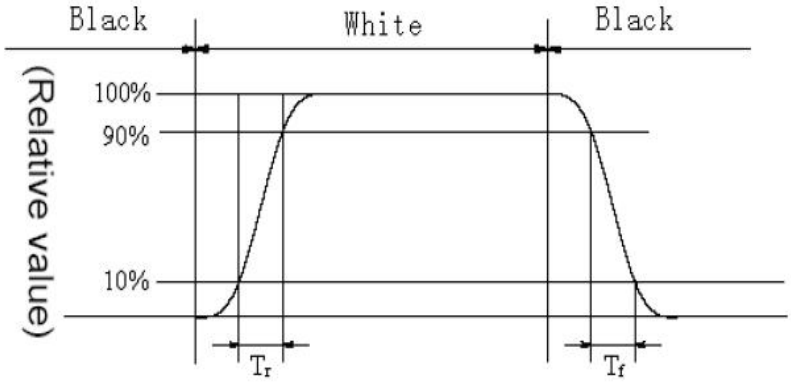
Note1: Definition of Viewing Angle: The viewing angle range that the CR>10

注 1：视角的定义：CR10 的视角范围



Note2: Definition of Response time: Sum of T_R and T_F

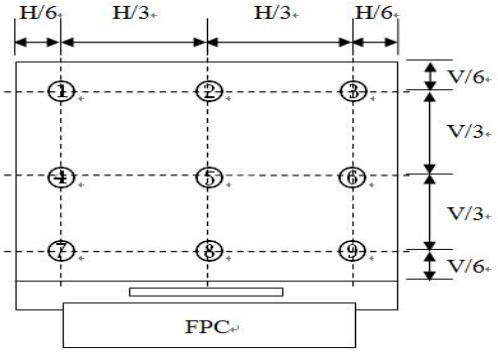
注 2：响应时间的定义：TR 和 TF 之和



Note 3: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

注 3：亮度均匀性的定义：有效区域分为 9 个测量区域，每个测量点都位于每个测量区域的中心。

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$

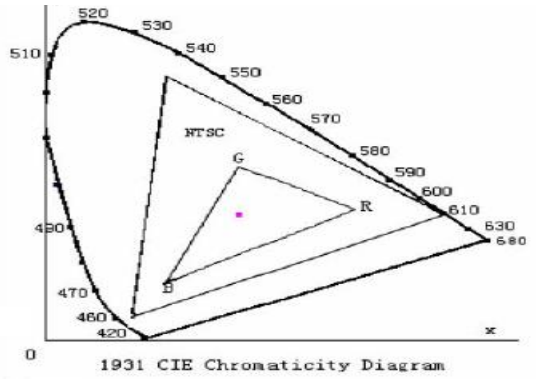


Note4: Definition of Contrast Ratio (CR): measured at the center point of panel
注 4：对比度（CR）的定义：在面板中心点测量

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.
注5：亮度的定义：白色的中心亮度定义为LCD表面1点平均的亮度值。
Note 6: Definition of Color Chromaticity (CIE 1931)
Color coordinates of white & red, green, blue measured at center point of LCD.
注 6：颜色色度的定义（CIE 1931）
在 LCD 中心点测量的白色和红色、绿色、蓝色的颜色坐标。
Note 7: Definition of NTSC ratio:
注 7:NTSC 比率的定义：

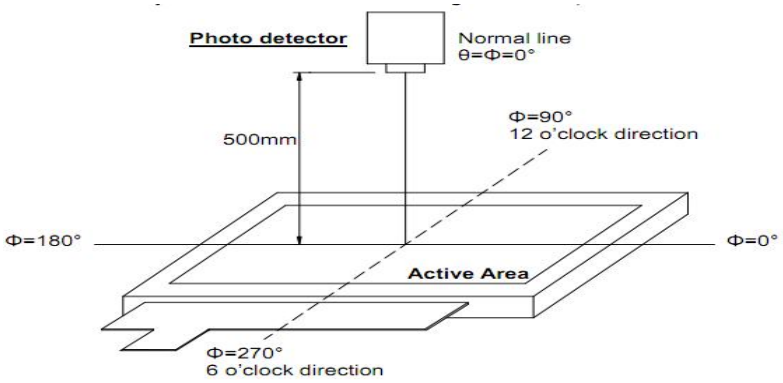
$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



Note 8: Definition of optical measurement system.
注8：光学测量系统的定义。

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen.(Response time is measured by Photo detector TOPCON BM-7, Field of view: 1°/Height: 500mm.)

光学特性应在暗室中测量。操作5分钟后，在LCD屏幕的中心点测量光学特性。（响应时间由光电探测器TOPCON BM-7测量，视场：1°/高度：500mm。）



7. RELIABILITY 可靠性实验规范

Item 项目	Test Condition 测试条件	Remark 备注
High Temperature Storage 高温存储	Ta =+70°C / 96Hours	Note1,2,3
Low Temperature Storage 低温存储	Ta =-40°C / 96Hours	Note1,2,3
High Temperature Operating 高温工作	Ta =+80°C / 96Hours	Note1,2,3
Low Temperature Operating 低温工作	Ta =-30°C / 96Hours	Note1,2,3
Temperature Cycle storage Test 冷热冲击	-40°C/30min Δ+70°C /30min for 30cycles,Transfer time less than 5min	Note2,3
Thermal humidity storage Test 高温高湿存储	60°C x 90%RH / 96Hours	Note2,3
Package Vibration Test 包装震动	Frequency: 10Hz~55Hz,Amplitude:1.5mm, 1 hrs for each direction of X, Y, Z	Note2
Packing shock test 包装跌落	Drop to the ground from 60cm height, 1 corner, 3 edges, 6 surfaces.	Note2

Inspection after Test 试验后检查:

Note1:Ta is the ambient temperature of samples.

注1:Ta是样品的环境温度。

Note 2: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

注2：在标准条件下，不存在可能影响显示功能的实际问题。可靠性测试后，产品仅保证运行工作，但不保证产品的所有规格。

Note 3: Before cosmetic and function tests , the product must have enough recovery time, at least 2 hours at room temperature.

注3：在进行外观和功能测试之前，产品必须有足够的恢复时间，在室温下至少2小时。

Note 4: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

注4：如果ESD损坏导致故障缺陷，如果重置后恢复正常状态，则判定为良好零件。

8. Specification of Quality Assurance 质量保证规范:

8-1. Purpose 目的

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by VIEWE.

本质量保证标准应确认 VIEWE 向买方供应的 LCD 模块产品的质量。

8-2. Standard for Quality Test 质量检验标准

a. Inspection 检查:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

在交货前，供应商应进行下列试验，并确认产品质量。

b. Electro-Optical Characteristics 光电特性:

According to the individual specification to test the product. 根据个别规格对产品进行测试。.

c. Test of Appearance Characteristics 外观特性试验:

According to the individual specification to test the product. 根据个别规格对产品进行测试。

d. Test of Reliability Characteristics 可靠性特性试验:

According to the definition of reliability on the specification for testing products.

根据测试产品规范中可靠性的定义。

e. Delivery Test 出厂试验:

Before delivering, the supplier should take the delivery test. 交货前，供货商应进行出厂试验。

(i) Test method: According to ISO2859-1. General Inspection Level Ⅱ take a single time.

(i) 试验方法：按 ISO2859-1。一般检验二级一次

(ii) The defects classify of AQL as following AQL 的缺陷分类如下:

Major defect 重大缺陷: AQL = 0.65

Minor defect 轻微缺陷: AQL = 2.5

Total defects 全部缺陷: AQL = 2.5

8-3. Non- conforming Analysis & Deal With Manners 不合格分析及处理方式

a. Non- conforming Analysis 不合格分析:

(i) Purchaser should supply the detail data of non- conforming sample and the non- conforming.

(i) 买方应提供不合格样品和不合格品的详细资料。

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(ii) 接受买方的详细资料后，不合格分析应在两周内完成。

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

(iii) 如果供应商不能按时完成分析，必须在 3 天前通知买方。

b. Disposition of non- conforming 不合格品的处置:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(i) 如果在装配过程中发现供应商的任何产品缺陷，供应商必须在确认后对每一个缺陷更换好的产品.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non- conforming when the reason of nonconforming is not sure.

(ii) 当不合格原因不确定时，供需双方应分析原因并讨论不合格的处理.

8-4. Agreement items 协议项目

Both sides should discuss together when the following problems happen.

出现下列问题时，双方应共同讨论。

a. There is any problem of standard of quality assurance, and both sides should think that must be modified.

质量保证标准有问题，双方都认为必须修改

b. There is any argument item which does not record in the standard of quality assurance.

有不在质量保证标准中记录的论证项目。

c. Any other special problem.

其他特殊问题。

8-5. Standard of The Product Appearance Test 产品外观检验标准

a. Manner of appearance test 外观试验方式:

(i) The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.

(i) 试验必须在 20W×2 或 40W 荧光灯下进行，视距必须在 30±5cm.

(ii) When test the model of transmissive product must add the reflective plate.

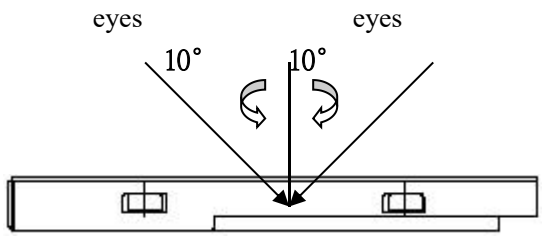
(ii) 测试透射产品型号时必须加反射板.

(iii)The test direction is base on around 10° of vertical line.

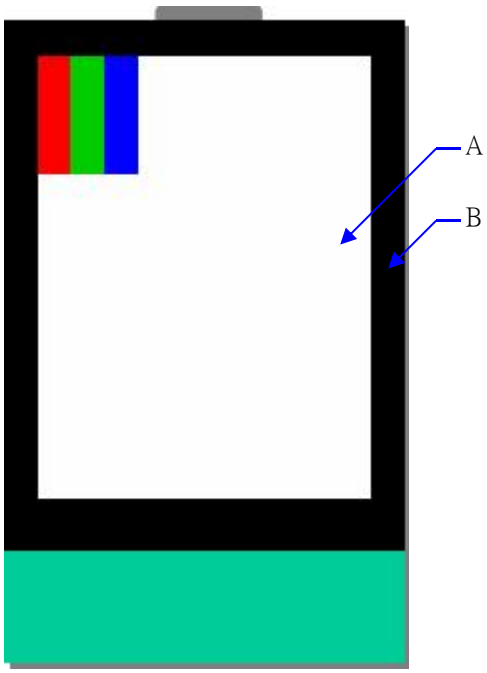
(iii) 试验方向以 10° 左右的垂直线为基准.

(iiii)Temperature: 25±5℃ Humidity: 60±10%RH

(iiii) 温度: 25±5℃ 湿度 60±10%RH



(iv) Definition of area 区域定义:



A. Area: Viewing area. 区域：观察区域

B. Area: Out of viewing area. 区域：不在视野范围内。
(Outside viewing area) (外部观察区域)

b. Basic principle: 基本原则:

(i) It will accord to the AQL when the standard can not be described.

(i) 当标准无法描述时，将符合 AQL.

(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

(ii) 当发生任何争议时，供应商和客户必须讨论最低可接受质量水平的样品.

(iii) Must add new item on time when it is necessary.

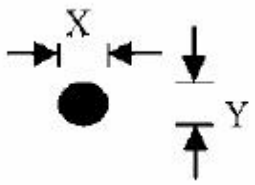
(iii) 必要时必须按时添加新项目.

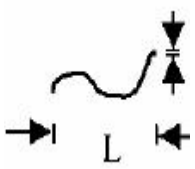
c. Standard of inspection 检验标准: (Unit: mm)

8-6. Inspection specification 检验规范

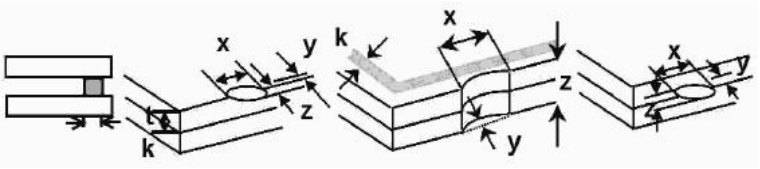
Defect out of viewing area can be neglected 可视区域以外的缺陷可以忽略.

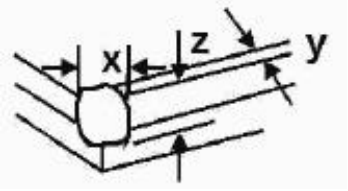
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>01</td><td>Electrical Testing
电气试验</td><td>1.1 Missing vertical, horizontal segment, segment contrast defect.
1.1 缺少垂直、水平段、段对比度缺陷。
1.2 Missing character, dot or icon. 1.2 缺少字符、圆点或图标。
1.3 Display malfunction. 1.3 显示故障
1.4 No function or no display. 1.4 无功能或无显示。
1.5 Current consumption exceeds product specifications.
1.5 电流消耗超过产品规格
1.6 LCD viewing angle defect. 1.6 液晶显示器视角缺陷。
1.7 Mixed product types. 1.7 不同产品混料。
1.8 Flicker 1.8 闪烁</td><td>0.65</td></tr>
<tr><td>02</td><td>Black or White spots or Bright spots or Color spots on LCD (Display only)
LCD 上的黑点或白点或亮点或色斑（仅显示）</td><td>2.1 White and black or color spots on display ≦ 0.25mm, no more than Five spots.
2.1 显示器上的黑白或色斑≤0.25 毫米，不超过 5 个。

2.2 Densely spaced: No more than three spots within 3mm.
2.2 密集间距：3mm 内不超过三处。</td><td>2.5</td></tr>
<tr><td rowspan="2">03</td><td rowspan="2">LCD and Touch Panel black spots, white spots, contamination (non – display)
LCD 和触摸屏黑点，白点，脏污（非显示区）</td><td>3.1 Round type: As following drawing 圆形：如下图所示
Φ = (X+Y) / 2
 

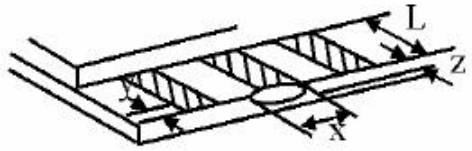
<table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>Φ≦0.10</td><td>Accept no dense</td></tr><tr><td>0.10< Φ≦0.20</td><td>3</td></tr><tr><td>0.20< Φ≦0.25</td><td>2</td></tr><tr><td>0.25< Φ≦0.30</td><td>1</td></tr><tr><td>0.30< Φ</td><td>0</td></tr></table>* Densely spaced: No more than two spots within 3mm.
密集间距：3mm 内不超过 2 处.</td><td>2.5</td></tr>
<tr><td>3.2 Line type: (As following drawing) 线型：（如下图所示）
 

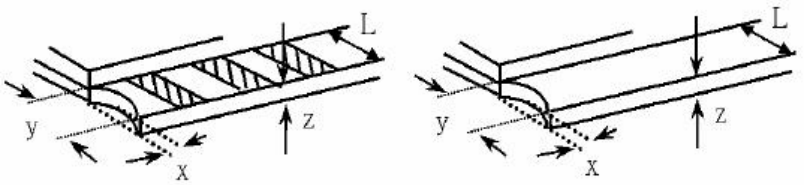
<table><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>---</td><td>W≦0.02</td><td>Accept no dense</td></tr><tr><td>L≦3.0</td><td>0.02<W≦0.05</td><td rowspan="2">2</td></tr><tr><td>L≦2.5</td><td>0.03<W≦0.15</td></tr><tr><td>---</td><td>0.15<W</td><td>Rejection</td></tr></table>* Densely spaced: No more than two lines within 3mm.
*密集间距：3mm 以内不超过两行。</td><td>2.5</td></tr>
</table>

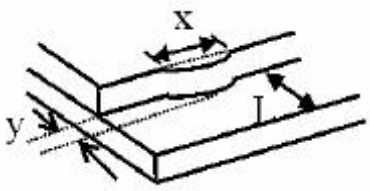
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>04</td><td>Polarizer bubbles
偏光片气泡</td><td>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction
如果气泡可见，用黑点判断规格，不容易找到，必须登记指定方向
<table>
<tr><th>Size Φ(mm)</th><th>Acceptable Q'ty</th></tr>
<tr><td>Φ≦0.20</td><td>Accept no dense</td></tr>
<tr><td>0.20< Φ≦0.50</td><td>3</td></tr>
<tr><td>0.50< Φ≦1.00</td><td>2</td></tr>
<tr><td>1.00< Φ</td><td>0</td></tr>
<tr><td>Total Q’ty</td><td>3</td></tr>
</table></td><td>2.5</td></tr>
<tr><td>05</td><td>Scratches 划痕</td><td>Follow NO.3 -2 Line Type. 遵循 3.2 号线类型.</td><td></td></tr>
<tr><td>06</td><td>Chipped glass
玻璃破损</td><td>Symbols 符号:
x: Chip length 缺损长度 y: Chip width 缺损宽度 z: Chip thickness 缺损厚度
k: Seal width 封口宽度 t: Glass thickness 玻璃厚度 a: LCD side length 玻璃边长
L: Electrode pad length 电极长度
6.1 General glass chip 普通玻璃破损:
6.1.1 Chip on panel surface and crack between panels :
面板表面的缺损和面板之间的裂缝：
 

<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing are</td><td>x≦1/8a</td></tr>
<tr><td>1/2t< z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙ Unit: mm
⊙ If there are 2 or more chips, x is the total length of each chip
如果有 2 个或更多缺损，x 是每个缺损的总长度
6.1.2 Corner crack 角破损:
 

<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr>
<tr><td>1/2t< z≦2t</td><td>Not exceed1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙ Unit: mm
⊙ If there are 2 or more chips, x is the total length of each chip
如果有 2 个或更多缺损，x 是每个缺损的总长度</td><td>2.5</td></tr>
</table>

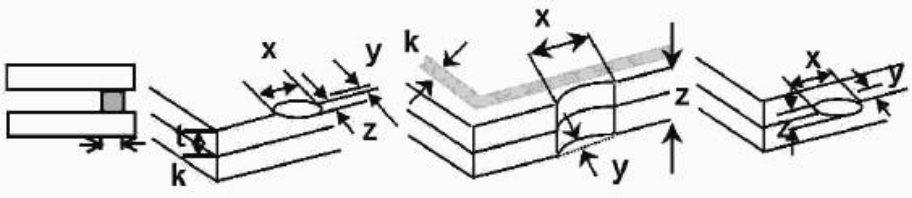
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>07</td><td>Glass crack
玻璃裂纹</td><td>
Symbols 符号:
x: Chip length 缺损长度 y: Chip width 缺损宽度 z: Chip thickness 缺损厚度
k: Seal width 封口宽度 t: Glass thickness 玻璃厚度 a: LCD side length 玻璃边长
L: Electrode pad length 电极长度
7.2 Protrusion over terminal 下玻璃突出部分:
7.2.1 Chip on electrode pad 电极处破损:


<table>
<tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr>
<tr><td>y≦0.5mm</td><td>x≦1/8a</td><td>0< z≦t</td></tr>
</table>
7.2.2 Non-conductive portion 非导电部分:


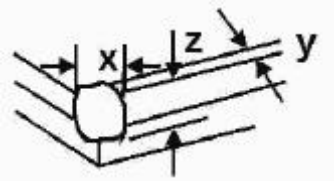
<table>
<tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr>
<tr><td>y≦L</td><td>x≦1/8a</td><td>0< z≦t</td></tr>
</table>
⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.
如果有缺口区域接触到 ITO 端子，则必须保留超过 2/3 的 ITO，并根据电极端子规范进行检查.
⊙ If the product will be heat sealed by the customer, the alignment mark must mot be damaged.
如果产品将由客户热压，则对准标记不得损坏。
7.2.3 Substrate protuberance and internal crack 基体突起和内部裂纹


<table>
<tr><td>y: width</td><td>x: length</td></tr>
<tr><td>y≦1/3L</td><td>X≦a</td></tr>
</table>
</td><td>2.5</td></tr>
</table>

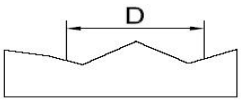
NO	Item	Criterion	AQL
08	Cracked glass 玻璃破碎	The LCD with extensive crack is not acceptable. 不接受有大裂纹的液晶显示器。	2.5
09	Backlight elements 背光元件	9.1 Illumination source flickers when lit. 光源点亮时闪烁。 9.2 Spots or scratches that appear when lit must be judged. 必须判断照明时出现的斑点或划痕。 Using LCD spot, lines and contamination standards. 采用液晶点、线和污染标准。 9.3 Backlight doesn't light or color is wrong. 背光不亮或颜色不对。	2.5 2.5 0.65
10	Bezel 铁框	Bezel must comply with product specifications. 铁框必须符合产品规范。	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.1 COB 密封不得有大于 0.2 毫米的针孔或污染。 11.2 COB seal surface may not have pinholes through to the IC. 11.2 COB 密封表面可能没有针孔穿过 IC。 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.3 COB 的高度不应超过装配图所示的高度。 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.4 印刷电路板密封区域外的密封剂不得超过 2 毫米。不应该超过三个地方。 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.5 印刷电路板上的零件必须与生产特性图上的零件相同，不得有错误零件、丢失零件或多余零件。 11.6 The jumper on the PCB should conform to the product characteristic chart. 11.6 PCB 上的跳线应符合产品特性图。	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage ≦ 1/2 FPC terminal width and can not affect the function, we judge accept. FPC 端子损坏≤1/2 FPC 端子宽度且不影响功能，我们判断接受。 12.2 FPC alignment hole damage ≦ 1/2 alignment area and can not affect the function, we judge accept. FPC 对准孔损坏≤1/2 对准面积且不能影响功能，我们判断接受。	2.5 2.5
13	Soldering 焊接	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.1 无虚焊、漏焊、氧化或凸柱。 13.2 No short circuits in components on PCB or FPC. 13.2 PCB 或 FPC 上的组件无短路。	2.5 0.65

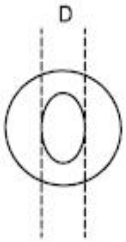
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>14</td><td>Touch Panel
Chipped glass
触摸盖板玻璃缺损</td><td>
Symbols 符号:
x: Chip length 缺损长度 y: Chip width 缺损宽度 z: Chip thickness 缺损厚度
k: Seal width 封口宽度 t: Glass thickness 玻璃厚度 a: LCD side length 玻璃边长
L: Electrode pad length 电极长度
14.1 General glass chip 普通玻璃缺损:
14.1.1 Chip on panel surface and crack between panels:
玻璃表面缺损和玻璃直接的裂缝


<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦t</td><td>≦1/2 k and not over viewing area</td><td>x≦1/8a</td></tr>
</table>
⊙ Unit: mm
⊙ If there are 2 or more chips, x is the total length of each chip
如果有 2 个或更多缺损，x 是每个缺损的总长度

14.1.2 Corner crack:


<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>z≦t</td><td>≦1/2 k and not over viewing area</td><td>x≦1/8a</td></tr>
</table>
⊙ Unit: mm
⊙ If there are 2 or more chips, x is the total length of each chip
如果有 2 个或更多缺损，x 是每个缺损的总长度
</td><td>2.5</td></tr>
</table>

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>15</td><td>Touch Panel(Fish eye、dent and bubble on film)
触摸屏（鱼眼、凹痕和薄膜上的气泡）</td><td>
<table>
<tr><th>SIZE(mm)</th><th>Acceptable Q’ty</th></tr>
<tr><td>Φ≦0.2</td><td>Accept no dese</td></tr>
<tr><td>0.2< D ≦0.4</td><td>5</td></tr>
<tr><td>0.4< D ≦0.5</td><td>2</td></tr>
<tr><td>0.5< D</td><td>0</td></tr>
</table>




</td><td>2.5</td></tr>
<tr><td>16</td><td>Touch Panel Newton ring
触摸屏牛顿环</td><td>Newton ring dimension ≦ 1/2 touch panel area and not affect font and line distortion (≦2.5%), it is acceptable.
牛顿环尺寸≤触摸屏面积的 1/2，且不影响字体和线条失真（≤2.5%），是可以接受的。</td><td>2.5</td></tr>
<tr><td>17</td><td>Touch Panel Linearity
触摸屏线性</td><td>Less than 2.5% is acceptable.　低于 2.5%是可以接受的。</td><td>2.5</td></tr>
<tr><td>18</td><td>LCD Ripple
LCD 水波纹</td><td>Touch the touch panel, can not see the LCD ripple.
触摸触摸屏，看不到液晶波纹。
Pen: R 1.0mm silicon rubber
笔：R 1.0mm 硅橡胶。.
Operation Force: 80g
操作力：80g</td><td>2.5</td></tr>
<tr><td>19</td><td>General appearance
整体外观</td><td>19.1 Pin type must match type in specification sheet.
19.1 引脚类型必须与规格表中的类型相匹配。
19.2 LCD pin loose or missing pins.
19.2 LCD 引脚松动或缺失。
19.3 Product packaging must the same as specified on packaging specification sheet.
19.3 产品包装必须与包装规格表上的规定相同。
19.4 Product dimension and structure must conform to product specification sheet.
19.4 产品尺寸和结构必须符合产品规格书。</td><td>0.65
0.65
0.65
0.65</td></tr>
</table>

9. Handling Precaution 操作注意事项:

9-1 Handling of LCM 液晶显示屏的组装

- Don't give external shock. 不要受到外来冲击。
- Don't apply excessive force on the surface. 不要在表面施加过大的力。
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
  液晶显示器中的液体是有害物质。不得舔舐和吞咽。当液体附着在手、皮肤、布等上时，立即彻底清洗。
- Don't operate it above the absolute maximum rating.
  不要超过绝对最大额定值
- Don't disassemble the LCM. 不要拆解LCM
- The operators should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads,the copper leads on the PCB and the interface terminals with any parts of the human body.
  操作员在接触模块时应接地。切勿用人体任何部位接触LSI焊盘、PCB上的铜引线和接口端子等任何导电部件。
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
  模块应放在防静电袋或其他防静电容器中储存。
- The module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.
  该模块表面有保护膜以保护显示表面。剥离此保护膜时要小心，因为可能会产生静电。

9-2 Storage 存储

- Store in an ambient temperature of 25±10℃, and in a relative humidity of 50±10%RH. Don't expose to sunlight or fluorescent light.

  储存在25±10℃的环境温度和50±10%相对湿度下。不要暴露在阳光或荧光灯下。

- Storage in a clean environment, free from dust, active gas, and solvent.
  储存在清洁的环境中，无灰尘、活性气体和溶剂。
- Store in anti-static electricity container. 存放在防静电容器中。
- Store without any physical load. 无任何物理负载储存。

9-3 Soldering 焊接

- Use only soldering irons with proper grounding and no leakage.
  只能使用接地正确、无泄漏的烙铁。
- Iron: No higher than 280±10℃ and less than 3 sec during Hand soldering.

  烙铁：手工焊接时温度不高于280±10℃，时间不超过3秒。

- Rewiring: no more than 2 times. 重新焊接：不超过2次

10. PACKAGE DRAWING