



# SPECIFICATION

## 规格书

客户名称 Customer	
产品型号 Part NO.	<b>W550HC003-A</b>
产品内容 Product type	Mode: Transmissive type. Normally black. TFT LCD Module LCD Module: Graphic 720RGB*1280Dot-matrix
备注栏 Remarks	<input type="checkbox"/> APPROVAL FOR SEPCIFICATIONS ONLY <input checked="" type="checkbox"/> APPROVAL FOR SEPCIFICATIONS AND SAMPLE
客户确认签章 Signature by Customer:	

PREPARED BY	CHECKED BY	APPROVED BY

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## 1. General Description

W550HDC001-A is a 720\*1280 dots matrix TFT LCD module. It has a TFT panel composed of 2160 sources and 1280gates. The LCM can be easily accessed by micro-controller.

## 2. Features

Display Mode	Transmissive
	a-TFT
Display Format	Graphic 720RGB*1280 Dot-matrix
Input Data	MIPI 4Lane interface
Viewing Direction	ALL
Drive	ILI9881D-00T00GA

## 3. Mechanical Specification

Item	Specifications	Unit
Dimensional outline	71.04 (W)*129.57(H)*1.66 ± 0.05 (FPC not include)	mm
Resolution	720RGB*1280	dots
LCD Active area	68.04(W)*120.96(H)	mm
Pixel size	0.0945 (W)*0.0945 (H)	mm





## 5. Maximum Ratings

Item	Symbol	Min	Max	Unit	Note
Supply voltage	V	-5.6	5.6	V	
Operating temperature	T <sub>op</sub>	-20	70	V	
Storage temperature	T <sub>STR</sub>	-30	80	°C	

## 6. Electrical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Logic	V <sub>CC</sub>		1.65	1.8	3.3	V
Input Voltage	H level	T <sub>IH</sub>		0.7*IOVCC		IOVCC	V
	L level	T <sub>IL</sub>		V <sub>SS</sub>		0.2* IOVCC	

## 7. Backlight Characteristic

Item	Symbol	Min	Typical	Max	Unit
LED module Forward voltage	V <sub>LED</sub>	-	19.2	--	V
LED module current	V <sub>LED</sub>		40		mA
L/G Surface Luminance ★1	L <sub>S</sub>	-	9500		Cd/m <sup>3</sup>
LCM Surface brightness uniform ★2	L <sub>D</sub>	80			%

★ 1Test condition is:

- (a) Center point on active area.
- (b)Best Contrast.

★2Uniform measure condition:

- (1)Measure 9 point. Measure location show below;
- (2)Uniform=(Min. brightness /Max. brightness)\*100%
- (3)Best Contrast.



## 8. Module Function Description

### 8.1 Pin Descriptions

Pin No.	Symbol	Functional	Notes
1-3	VDD2.8V	Analog power supply 2.8V	
4	IOVCC1.8V	Interface power supply 1.8V	
5-7	NC	No connect	
8	RESET	Reset signal	
9	NC	No connect	
10	GND	Power Ground	
11	D3N	Negative polarity of low voltage differential data3 signal	
12	D3P	Positive polarity of low voltage differential data3 signal	
13	GND	Power Ground	
14	D0N	Negative polarity of low voltage differential data0 signal	
15	D0P	Positive polarity of low voltage differential data0 signal	
16	GND	Power Ground	
17	CLKN	Negative polarity of low voltage differential clock signal	
18	CLKP	Positive polarity of low voltage differential clock signal	
19	GND	Power Ground	
20	D1N	Negative polarity of low voltage differential data1 signal	
21	D1P	Positive polarity of low voltage differential data1 signal	
22	GND	Power Ground	
23	D2N	Negative polarity of low voltage differential data2 signal	
24	D2P	Positive polarity of low voltage differential data2 signal	
25	GND	Power Ground	
26	LEDPWM	Backlight control signal	
27-30	NC	No connect	
31-32	LEDA	Backlight anode	
33-38	LEDK	Backlight cathode	
39	GND	Power Ground	

## 8.2 Timing characteristics.

Refer to datasheet

## 9. Electro-optical Characteristics

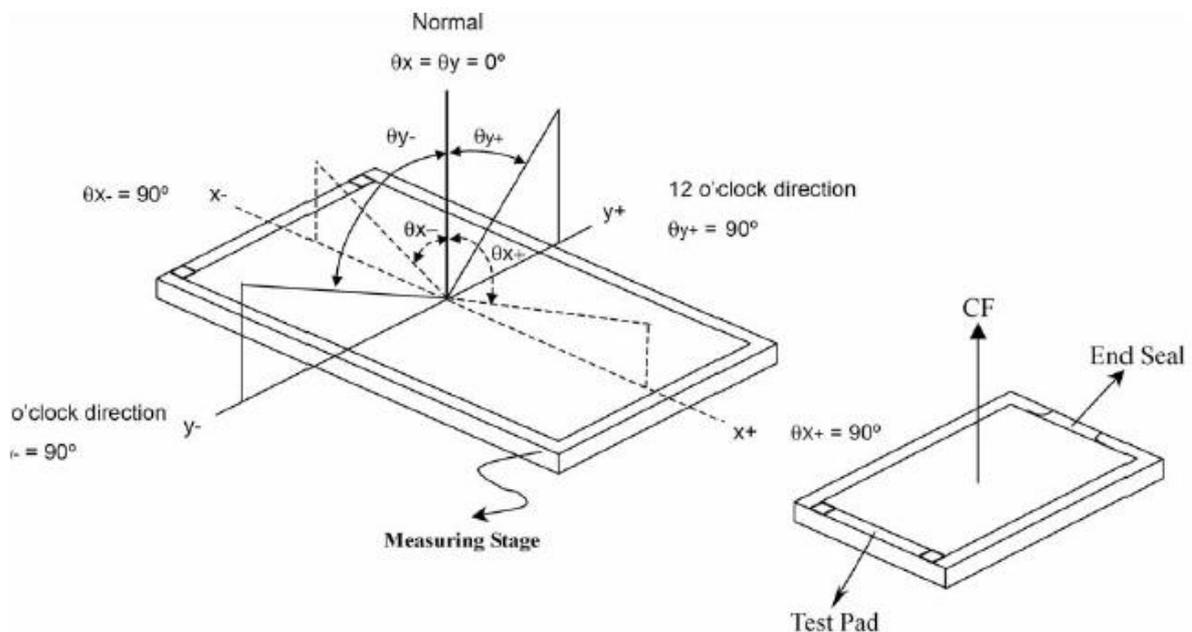
Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Viewing angle range	Horizontal	θ21	80	85	-	Deg.	[Note1,6]	
		θ22	80	85				
	Vertical	θ11	80	85	-	Deg.		
		θ12	80	85				
Brightness	Br	θ=0 deg.		-		nits	[Note1,6]	
Contrast ratio	CR		800	1000	-	-	[Note2,6]	
Response time	Tr+tf		-	30	35	ms	[Note3,6]	
Transmittance	Tr%		4.3	4.9			[With APCF] [Note 4,5]	
Chromaticity of white	x		0.286	0.316	0.346	-	With C-light [Note 5]	
	y		0.330	0.360	0.390	-		
Chromaticity of red	x		0.627	0.657	0.687	-		
	y		0.297	0.327	0.357	-		
Chromaticity of green	x		0.236	0.266	0.296	-		
	y		0.562	0.592	0.622	-		
Chromaticity of blue	x	0.108	0.138	0.168	-			
	y	0.078	0.108	0.138	-			
Uniformity	%	-	-	80	-	-		[Note 7]
NTSC Ratio	%	-	65	70	-	-		[Note 5]

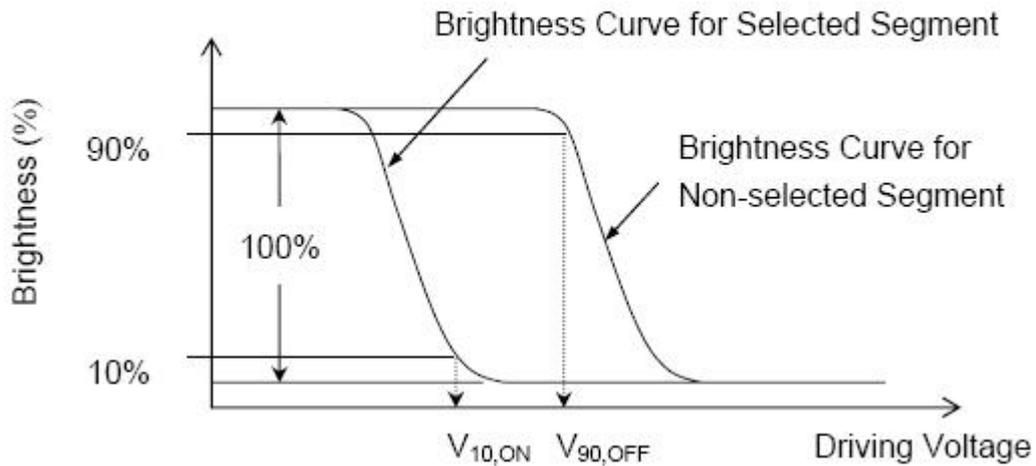
\*The measurement shall be executed after more than 5 minutes while backlight turning on.

\*These values are measured with NCPD standard back light unit.

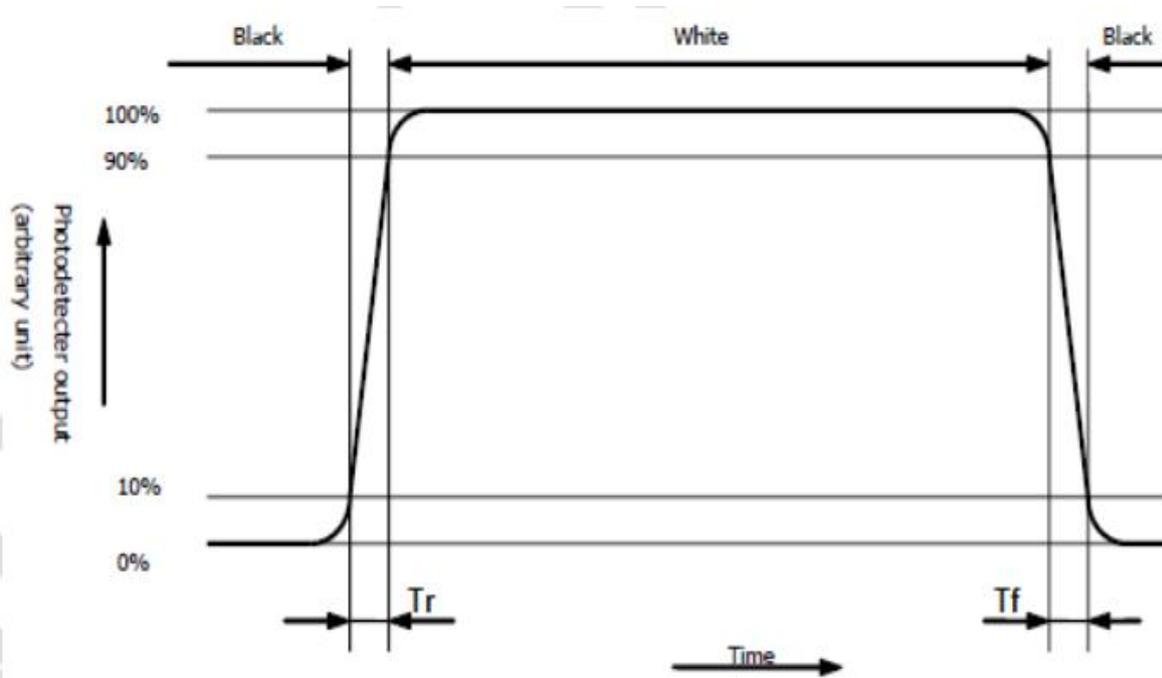
\* The optical characteristics are measured using the following equipment.



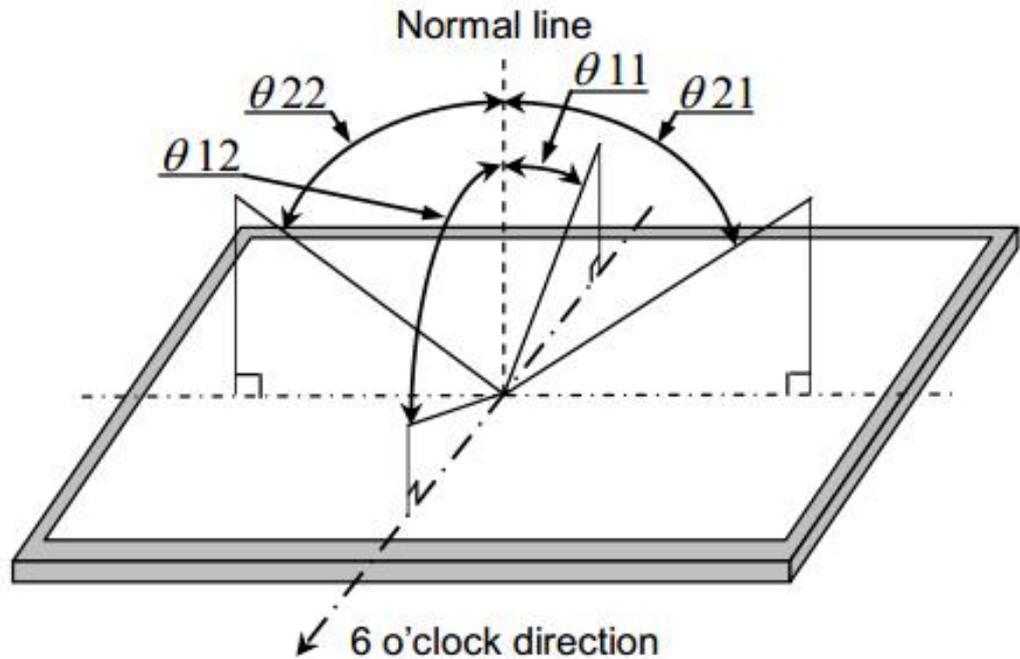
$$V_{op} = (V_{10,ON} + V_{90,OFF})/2$$



**.Note2.Definition of Optical Response Time:**

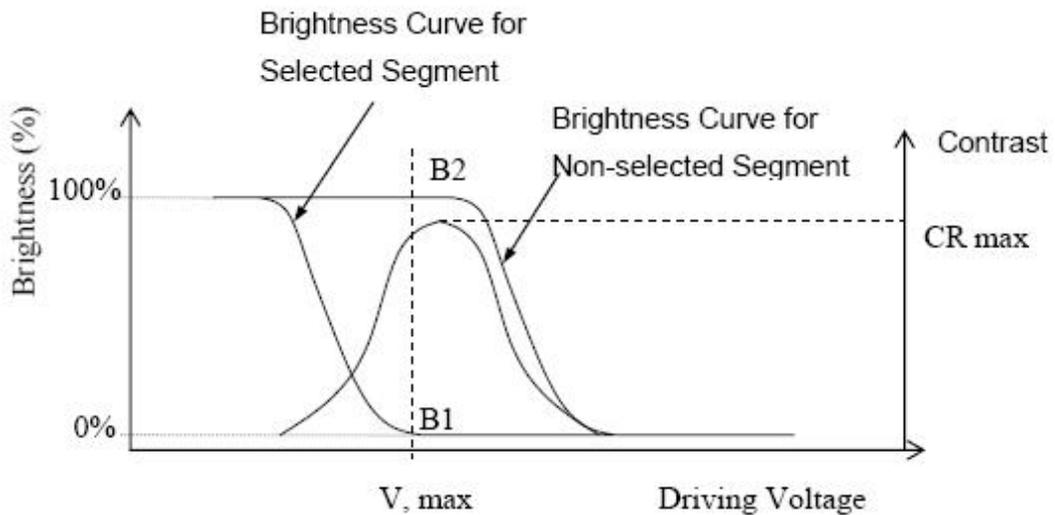


.Note3.Definition of Viewing Angle  $\theta$  and  $\phi$  :



Note4.Definition of Contrast ratio (CR):

$$CR = \frac{\text{Brightness of Non-selected Segment (B2)}}{\text{Brightness of Selected Segment (B1)}}$$





## 10. Reliability

### 10.1 Mtbf

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal

### 10.2 Test condition

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	80°C*240Hrs	<ul style="list-style-type: none"> <li>No Defect Of Operational Function In Room Temperature Are Allowable</li> <li>IDD of LCM in Pre-and Post-Test Should Follow Specification</li> </ul>
2	Low Temperature Non-Operating Test	-30°C*240Hrs	
3	High Temperature/Humidity Non Operating Test	60°C*90%RH*240Hrs	
4	High Temperature Operating Test	70°C*240Hrs	
5	Low Temperature Operating Test	-20°C*240Hrs	
6	Thermal Shock Test	-20 °C (30Min) v 70 °C (30Min) *10CYCLES	

Notes:

- Judgments should be made after exposure in room temperature for two hours.
- The distill water is used for the high temperature/humidity test.
- The sample above is individually for every reliability tests condition.

## 11. Inspection standards

1. AQL(Acceptable Quality Level)

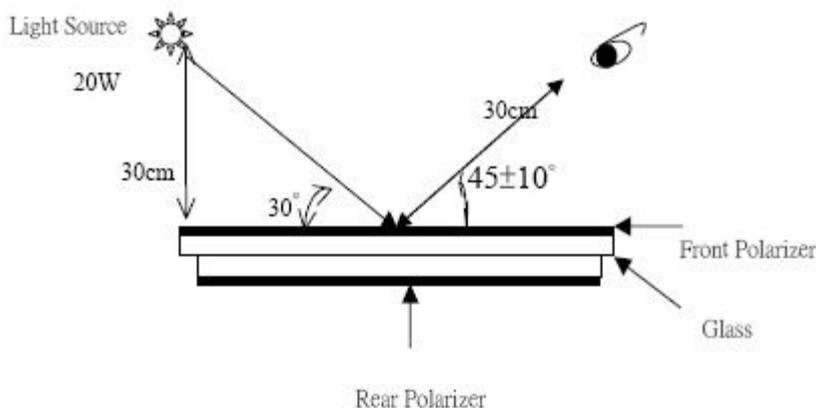
AQL of major and minor defect.

	MAJOR DEFECT	MINOR DEFECT
AQL	0.65	1.5

### 2. Basic conditions for inspection

The LCM face to us, in normal environment, the lux is  $1000 \pm 200$ . (Darkroom's lux:  $100 \pm 50$ ), About an angle of incidence  $30^\circ$ , a distance of 30 cm with an angle of  $45^\circ$  degree to check the products without uncovering the film!

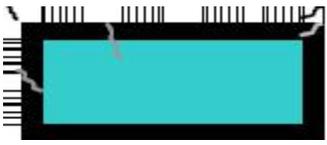
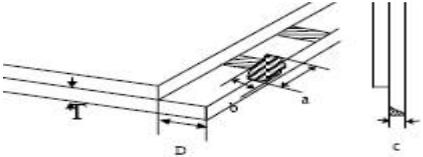
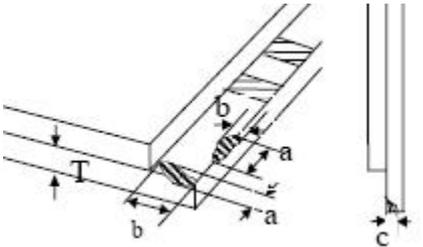
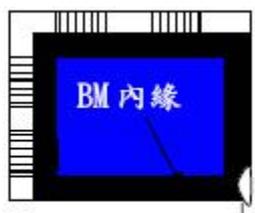
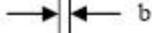
(As shown below)



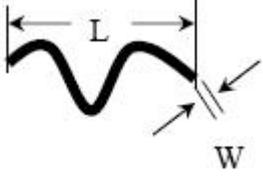
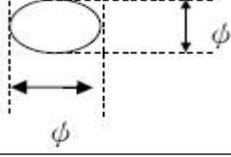
### 3. Inspection item and criteria

#### 3.1 Visual inspection criterion in immobility

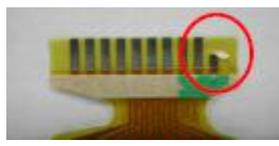
##### 3.1.1 Glass defect

NO	Defect item	Criteria	Remark
1	Dimension Unconformity (Major defect)	By Engineering Drawing	
2	Cracks (Major defect)	1. Linear cracks panel 2. Nonlinear crack contrast by limited sample	
3	Glass extrude the conductive area (minor defect)	a: disregards and no influence assemblage. 1) $b \leq 1/3$ Pin width (non bonding area) 2) bonding area $\leq 0.5$ mm	A: Length, b: Width
4	Pin-side ,conductive area damaged (minor defect)	(a c: disregards) $b \leq 1/3$ of effective length for bonding electrode	a: length, b: Width, c: Thickness 
5	Pin-side, non-conductive area damaged (minor defect)	1) Damage area don't touch the ITO (Including contraposition mark, except scribing mark) 2) $C < T$ $b \cong BM 1/3$ of width 3) $c = T$ b not touch the seal glue 4) a disregards	a: Length, b: Width c: Thickness 
6	Non-pin-side damage (minor defect)	$c < T$ 1) b exceeds $1/3 B_m$ $c = T$ b not touch the seal glue	c: Thickness b: width of  damage 

### 3.1.2LCD appearance defect(View area)

NO	Defect item	Criteria		Remark
		Specification	Allowable	
1	Fiber、 glass cratch、 polarizer scratch/folded (minor defect)	$W \leq 0.03\text{mm}$	disregard	note1:L: Length, W: Width note2: disregard if out of AA 
		$0.03\text{mm} < W \leq 0.05\text{mm};$ $L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.1\text{mm};$ $L \leq 3.0\text{mm}$	1	
		$W > 0.1\text{mm}; L > 3.0\text{mm}$	0	
2	Polarizer bubble、 concave and convex (minor defect)	$\phi \leq 0.2\text{mm}$	disregard	note1: $\phi = (L+W)/2$ , L:Length, W :Width note2:disregard if out of AA
		$0.2\text{mm} < \phi \leq 0.3\text{mm}$	2	
		$0.3\text{mm} < \phi \leq 0.5\text{mm}$	1	
		$0.5\text{mm} < \phi$	0	
3	Black dots、 dirty dots、 impurities、 eye winker (minor defect)	$\phi \leq 0.15\text{mm}$	disregard	note2:disregard if out of AA 
		$0.15\text{mm} < \phi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \phi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \phi$	0	
4	Polarizer prick (minor defect)	$\phi \leq 0.1\text{mm}$	disregard	note1: $\phi = (L+W)/2$ , L=Length, W=Width note2:the distance between two dots>5mm
		$0.1\text{mm} < \phi \leq 0.25\text{mm}$	3	
		$\phi > 0.25\text{mm}$	0	

### 3.1.3FPC

NO	Defect item	Criteria		Remark
1	Copper screen peel (minor defect)	Copper screen peel 【Reject】		
2	No release tape or peel	No release tape or peel 【Reject】		
3	Dirty dot and impurity of FPC for customer using side (minor defect)	Specification	Allowable	Note1: Cannot have stride ITO impurities
		$\phi \leq 0.25\text{mm}$	2	
		$\phi > 0.25$	0	

### 3.1.4 Black tape & Mara tape

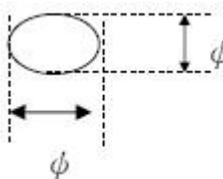
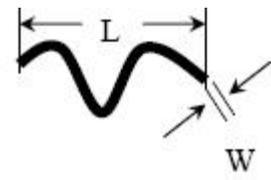
NO	Defect item	Criteria	Remark
1	FPC or H/S black tape (minor defect)	1. shift spec: 1) glue to the polarize <b>【Reject】</b> 2) IC bare <b>【Reject】</b> 2. left-and-right spec: 1) exceed of FPC edge or H-S edge <b>【Reject】</b> 2) IC bare <b>【Reject】</b>	
2	No black tape (major defect)	No black tape <b>【Reject】</b>	
3	Tape position mistake (minor defect)	Not by engineering drawing	
4	Mara tape defect (minor defect)	Peel before pulling the protecting film <b>【Reject】</b>	

### 3.1.5 Silicon and Taffy glue

NO	Defect item	Criteria	Remark
1	Quantity of silicon (major defect)	Uncover the ITO and circuit area <b>【Reject】</b>	note: compared by engineering
2	Taffy glue (major defect)	1. Uncover the reveal copper area <b>【Reject】</b> 2. Cover layer 0.3mm(Min)~3.0mm(Max) <b>【Reject】</b>	note: if customer has special requirement, refer to the technical document 
3	Depth of glue covering (major defect)	Depth of glue covering overtop front Polarizer <b>【Reject】</b>	Except of the special requirement



### 3.2 Electrical criteria

NO	Defect item	Criteria	Remark	
1	No display (major defect)	No display 【Reject】		
2	Missing line (major defect)	Missing line 【Reject】		
3	Seg-com light and dark (major defect)	Seg-com light and dark 【Reject】	ND filter 2% test	
4	No display in immobility (major defect)	No display in immobility 【Reject】		
5	Flicker of Pattern (major defect)	Flicker of Pattern 【Reject】		
6	Mura (major defect)	ND filter 2%test		
7	Over current (major defect)	Over current 【Reject】		
8	Voltage out of specification (major defect)	Voltage out of specification 【Reject】		
9	Pattern blur, error code (major defect)	Pattern blur, error code 【Reject】		
10	Dark light, Flicker (major defect)	Dark light, Flicker 【Reject】		
11	Black/white dots 、 Dirty dots、 eye winker (major defect)	Specification	Allowable	Note1:disregard if out of AA 
		$\phi \leq 0.15\text{mm}$	disregard	
		$0.15\text{mm} < \phi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \phi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \phi$	0	
12	Fiber 、glass crutch、Polarizer scratch/folded (major defect)	$W \leq 0.03\text{mm}$	disregard	Note1:L: Length, W: Width Note2: disregard if out of AA 
		$0.03\text{mm} < W \leq 0.05\text{mm}$ $L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.1\text{mm}$ $L \leq 3.0\text{mm}$	1	
		$W > 0.1\text{mm}; L > 3.0\text{mm}$	0	



## 12. Precautions for using LCD modules.

### 12.1 Safety

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

### 12.2 Storage Conditions

- (4) Store the panel or module in a dark place where the temperature is  $23 \pm 5^{\circ}\text{C}$  and the humidity is below  $45 \pm 20\% \text{RH}$ .
- (5) Store in anti-static electricity container.
- (6) Store in clean environment, free from dust, active gas, and solvent.
- (7) Do not place the module near organics solvents or corrosive gases.
- (8) Do not crush, shake, or jolt the module.

### 12.3 Handling Precautions

- (9) Avoid static electricity, which can damage the CMOS LSI.
- (10) The polarizing plate of the display is very fragile, please handle it very carefully.
- (11) Do not give external shock.
- (12) Do not apply excessive force on the surface.
- (13) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (14) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (15) Do not operate it above the absolute maximum rating.
- (16) Do not remove the panel or frame from the module.

### 12.4 Warranty

The period is within twelve months since the date of shipping out under normal using and storage conditions.

## 13. Factory

**FACTORY NAME:**

**FACTORY ADDRESS:**

**FACTORY PHONE:**

## 14. Revision history

Version	Revise record	Date
V0.1	Original version	2018.04.24