Thin-Film-Transistor LCD Module
Model:XTPV57TP01-03

Acceptance

Approved and Checked by

Approved by	Checked by		Made by

Revise Records

Rev.	Date	Contents	Written	Approved
A	2016/12/05	Preliminary Specification	LUO	JACK

Special Notes

Note1.	
Note2.	
Note3.	
Note4.	
Note5.	

1.General Description and Features

XTPV57TP01-03 is a TM (Transmissive) type color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT-LCD module, a driver circuit and a back-light unit . The resolution of a 5.7" contains 640RGBx480 dots and can display up to 262K colors. The following table described the features of XTPV57TP01-03

LCD Module

Item	Specification	Unit
Screen Size	5.7inches	Diagonal
Display Resolution	640RGB(H)x480(V)	Dot
Active Area	115.2 (H) x 96.4 (V)	mm
Outline Dimension	127(W) x 98.43(H) x 9.2 MAX(D)	mm
Display Mode	Normally white/Transmissive	--
Pixel Arrangement	RGB-Vertical Stripe	--
Display Color	262K	--
Gray scale inversion Direction	12 o'clock	
Viewing Direction	6 o'clock	--
Drive IC	HX8250*2 HX8678*1	--
TP	4WIRE -RTP	
Surface luminance	280 cd/㎡	

2.Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	--	127	--	mm	--
	Vertical (V)	--	98.43	--	mm	(1)
	Thickness (T)	--	--	9.2	mm	(2)
Weight		--	N/A	--	g	--

Note (1) Not include FPC.
Refer to the Outline Dimension for further information.
(2) Back-light unit are included.

3.Electrical Specifications

3.1 Absolute Max. Ratings

3.1.1 Absolute Ratings of Environment

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

(Ta=25±2°C, V_{SS}=GND=0)

Item	Symbol	Min.	Max.	Unit	Note
Operatingtemperature	T_{OPR}	-20	70	°C	(1)
Storage temperature	T_{STG}	-30	80	°C	(1,2,3)

Note (1) 95 % RH Max. (40 °C ≥ Ta). Maximum wet-bulb temperature at 39 °C or less. (Ta > 40 °C)
No condensation.

Note (2) In case of below 0°, the response time of liquid crystal (LC) becomes slower and the color of panel becomes darker than normal one. Level of retardation depends on temperature, because of LC's character

Note (3) Only operation is guarantied at operating temperature. Contrast, response time, another display quality are evaluated at +25°C.

3.2 Electrical Absolute Rating

3.2.1 TFT-LCD Module

(Voltage Referenced to VSS)

Item	Symbol	Value		Unit	Condition
		Min.	Max.		
Digital Power Supply Voltage	VDD	VSS-0.3	5.0	V	--

3.2.2 Back-Light Unit

(Ta=25±2°C)

Item	Symbol	Min.	Max.	Unit	Note
Current(1LED)	I_f	--	30	mA	(1)
voltage	V_R	--	5	V	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded. Functional operation should be restricted to the conditions described under normal operating conditions.

4 Electrical Characteristics

4.1 Backlight Unit

The back-light system is an edge-lighting type with twenty-one white LEDs (Light Emitting Diode).

(Ta=25±2°C)

Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
LED Voltage	VF	9.3	9.6	9.9	V	
LED Current	IF	-	140	-	mA	
Power Consumption	P_{BL}	-	-	-	mW	

Note (1) Where I_F = 140A, V_F = 9.6V $P_{BL} = V_F \times I_F$

5 Input Terminal Pin Assignment

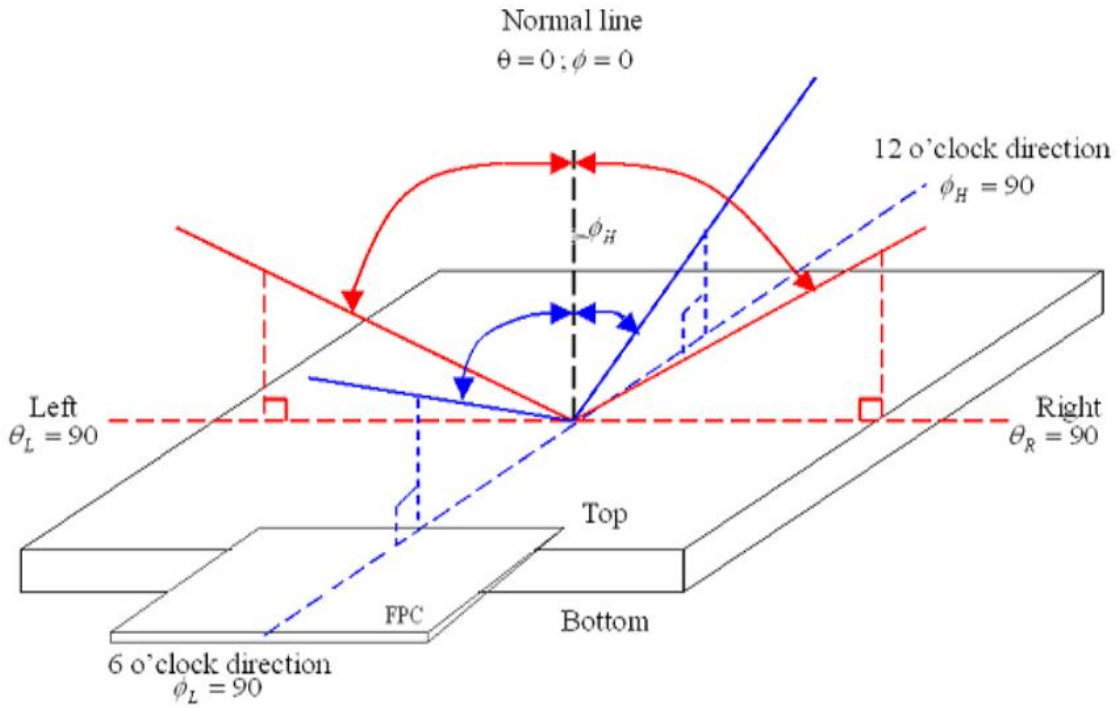
PIN.NO	SYMBOL	I/O/P	FUNCTI	MEMARK
1	U/D	I	Up/down scan setting. When UD=H, reverse scan. When UD=L, normal scan.	
2	NC			
3	HSYNC	I	Horizontal sync input in digital RGB and CCIR601 mode. (Short to GND if not used)	
4	VLED	P	BACKLINGHE INGPUT SUPPLY	
5	VLED	P	BACKLINGHE INGPUT SUPPLY	
6	VLED	P	BACKLINGHE INGPUT SUPPLY	
7	VCC	P	VOLTAGE	

8	**VSYNC**	**I**	Vertical sync input in digital RGB and CCIR601 mode. (Short to GND if not used)	
9	**DE**	**I**	Input data enable control. When DE mode, active High to enable data input. Default pull low.	
10	**X2**	**I**	**TP THE DATA**	
11	**Y1**	**I**	**TP THE DATA**	
12	**ADJ**	**I**	**CHIP ENABLE (ACTIVE HIGH)**	
13	**B5**	**I**	**RED DATA**	
14	**B4**	**I**	**RED DATA**	
15	**B3**	**I**	**RED DATA**	
16	**VSS**	**P**	**GROUN**	
17	**B2**	**I**	**RED DATA**	
18	**B1**	**I**	**RED DATA**	
19	**B0**	**I**	**RED DATA**	
20	**VSS**	**P**	**GROUN**	
21	**G5**	**I**	**RED DATA**	
22	**G4**	**I**	**RED DATA**	
23	**G3**	**I**	**RED DATA**	
24	**VSS**	**P**	**GROUN**	
25	**G2**	**I**	**RED DATA**	
26	**G1**	**I**	**RED DATA**	
27	**G0**	**I**	**RED DATA**	
28	**VSS**	**P**	**GROUN**	
29	**R5**	**I**	**RED DATA**	
30	**R4**	**I**	**RED DATA**	
31	**R3**	**I**	**RED DATA**	
32	**VSS**	**P**	**GROUN**	
33	**R2**	**I**	**RED DATA**	
34	**R1**	**I**	**RED DATA**	
35	**R0**	**I**	**RED DATA**	
36	**X1**	**I**	**TP THE DATA**	

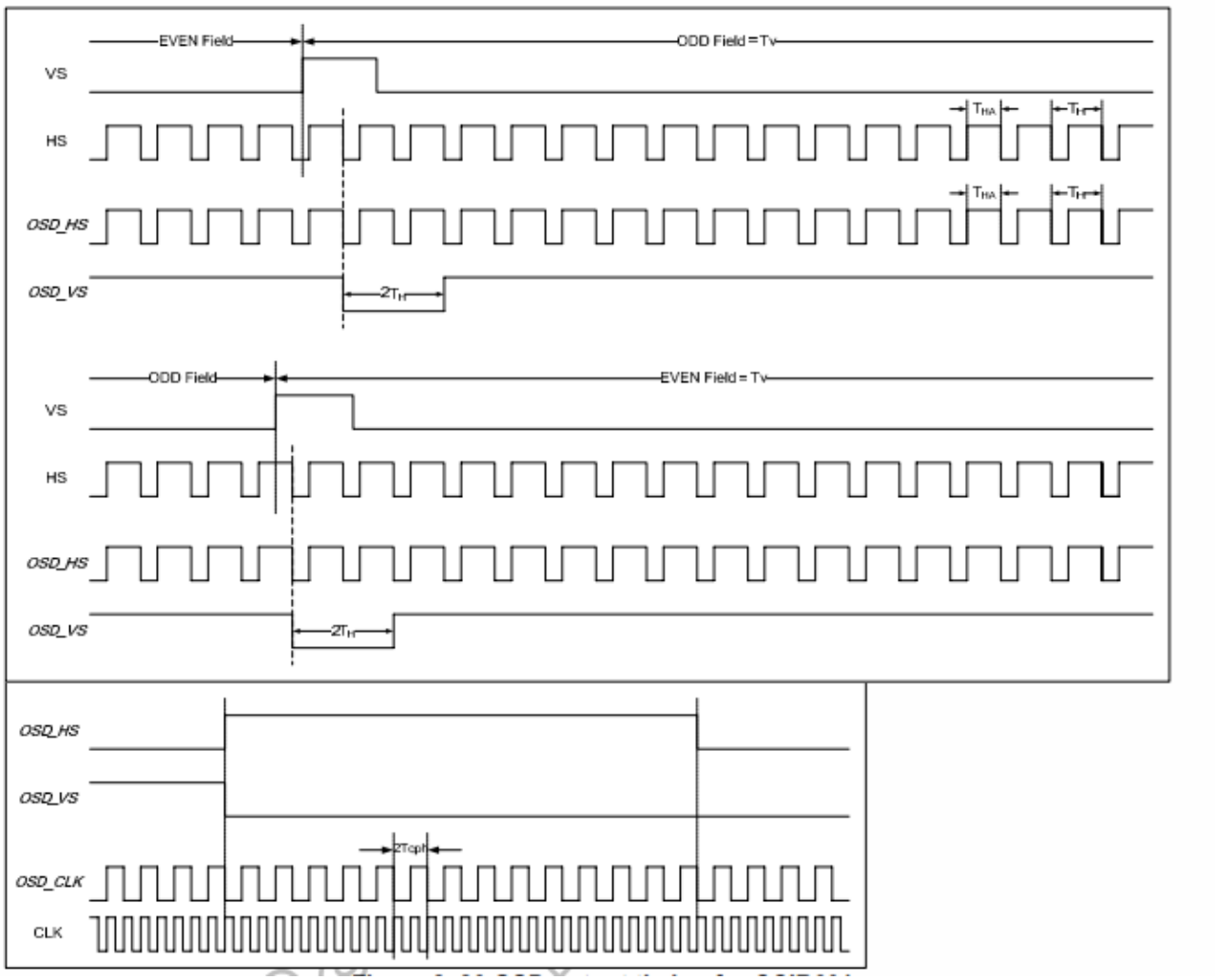
37	**Y2**	**I**	**TP THE DATA**	
38	**DCLK**	**I**	Clock signal. Latching data at the rising edge.	
39	**VSS**	**P**	**GROUN**	
40	**L/R**	**I**	The shift direction of device internal shift register is controlled by this pin as shown below: LR=H: STH→SO1→•••→SO960→STHO LR=L: STH→SO960→•••→SO1→STHO	

6 Optical Characteristics

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.
Color Filter Chromaticity	White	x	θ=ϕ= 0°	0.294	0.314	0.334
		y		0.325	0.345	0.365
	Red	x	θ=ϕ= 0°	0.607	0.627	0.647
		y		0.325	0.345	0.365
	Green	x	θ=ϕ= 0°	0.291	0.311	0.331
		y		0.530	0.550	0.570
	Blue	x	θ=ϕ= 0°	0.118	0.138	0.158
		y		0.130	0.150	0.170
	Gamut			51.0%		
Measured by C light						



7 Interface Timing



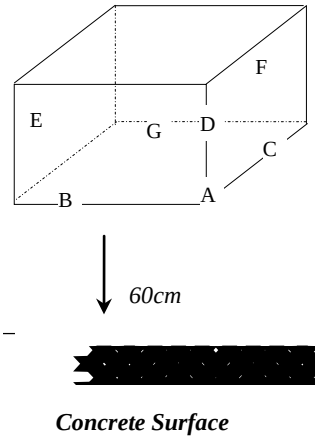
8 Reliability Condition for LCD

No change on display and in operation under the following test condition.

Condition: Unless otherwise specified, tests will be conducted under the following condition.

Temperature: 20±5°C Humidity: 65±5%RH

Tests will be not conducted under functioning state.

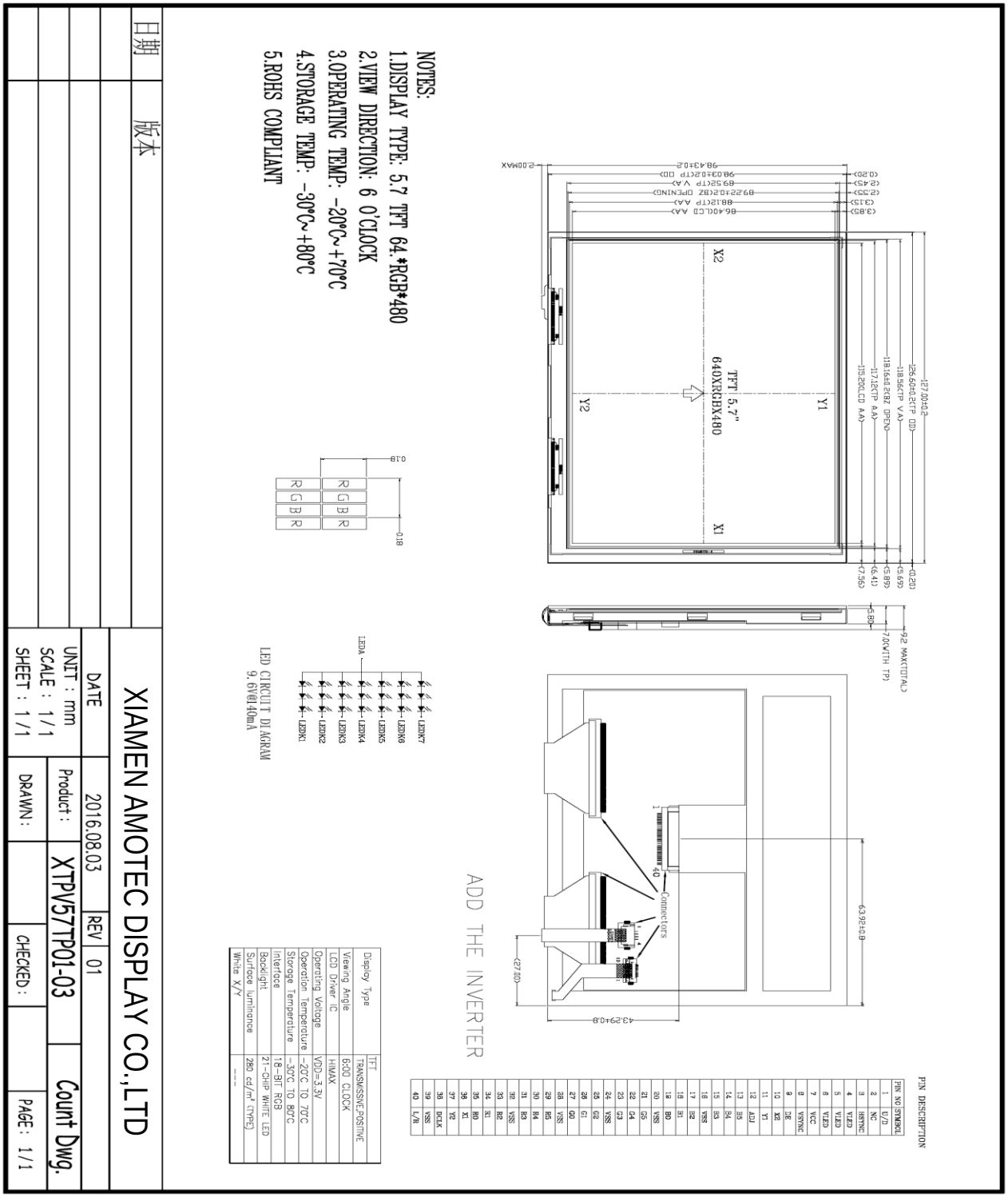
No.	Parameter	Condition	Notes
1	High Temperature Operating	70°C±2°C, 240hrs (Operation state)	--
2	Low Temperature Operating	-20°C±2°C, 240hrs (Operation state)	--
3	High Temperature Storage	80°C±2°C, 240hrs	--
4	Low Temperature Storage	-30°C±2°C, 240hrs	--
5	High Temperature and High Humidity Operation Test	60°C±2°C, 90%, 240hrs	--
6	Vibration Test	Total fixed amplitude: 1.5mm Vibration Frequency: 10~55Hz One cycle 60 seconds to 3 direction of X, Y, Z each 15 minutes.	--
7.	Drop Test	To be measured after dropping from 60cm high on the concrete surface in packing state.  *Dropping method corner dropping* *A corner: once* *Edge dropping* *B, C, D edge: once* *Face dropping* *E, F, G face: once*	--

Notes: 1. No dew condensation to be observed.

2. The function test shall be conducted after 4 hours storage at the normal temperature and humidity after removed from the test chamber.

3. Vibration test will be conducted to the product itself without putting I in a container.

9 Dimensional outlines



10 Incoming Inspection Standards

11.1 VISUAL & FUNCTION INSPECTION STANDARD

11.1.1 Inspection conditions

Inspection performed under the following conditions is recommended.

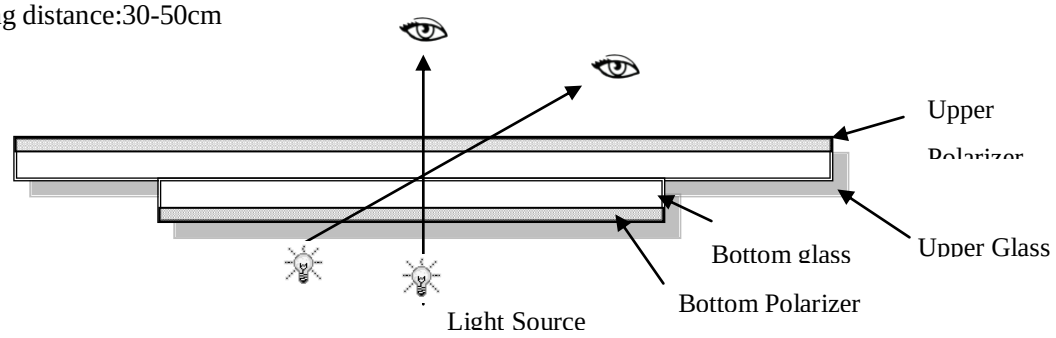
Temperature : 25±5℃

Humidity : 65%±10%RH

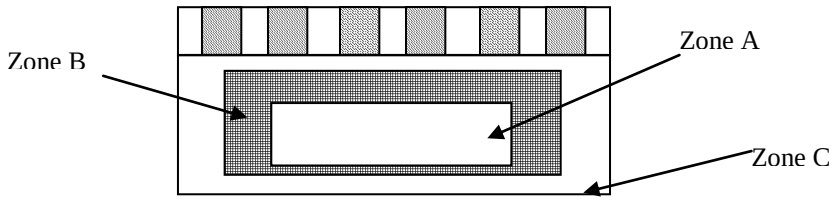
Viewing Angle : Normal viewing Angle.

Illumination: Single fluorescent lamp (300 to 700Lux)

Viewing distance:30-50cm



11.1.2 Definition



Zone A : Effective Viewing Area(Character or Digit can be seen)

Zone B : Viewing Area except Zone A

Zone C : Outside (Zone A+Zone B) which can not be seen after assembly by customer .)

Note:

As a general rule ,visual defects in Zone C can be ignored when it doesn't effect product function

or appearance after assembly by customer.

11.1.3 Sampling Plan

According to GB/T 2828-2003 ; , normal inspection, Class Ⅱ

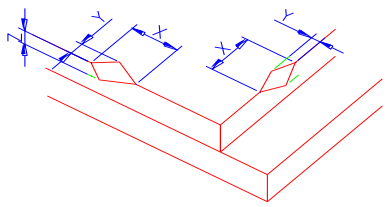
AQL:

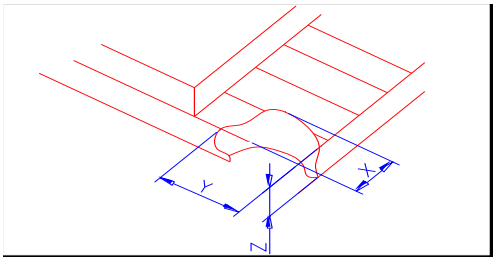
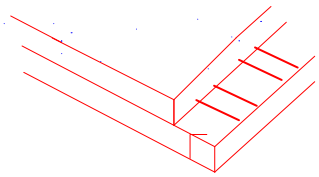
Major defect	Minor defect
0.65	1.5

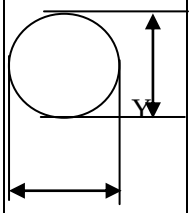
LCD: Liquid Crystal Display , TP: Touch Panel , LCM: Liquid Crystal Module

No	Items to be inspected	Criteria	Classification of defects
1	Functional defects	1) No display, Open or miss line 2) Display abnormally, Short 3) Backlight no lighting, abnormal lighting. 4) TP no function	Major
2	Missing	Missing component	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed	
4	Color tone	Color unevenness, refer to limited sample	Minor
5	Soldering appearance	Good soldering , Peeling off is not allowed.	
6	LCD/Polarizer/TP	Black/White spot/line, scratch, crack, etc.	

11.1.4 Criteria (Visual)

Number	Items	Criteria(mm)
1.0 LCD Crack/Broken NOTE:	(1) The edge of LCD broken	 X | Y | Z

<table>
<tr><td rowspan="3">X: Length
Y: Width
Z: Height
L: Length of ITO,
T: Height of LCD</td><td></td><td><table><tr><td>≤3.0mm</td><td><Inner border line of the seal</td><td>≤T</td></tr></table></td></tr>
<tr><td>(2)LCD corner broken</td><td> 
<table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0mm</td><td>≤L</td><td>≤T</td></tr></table></td></tr>
<tr><td>(3) LCD crack</td><td> 
Crack
Not allowed</td></tr>
</table>

<table>
<tr><th>Number</th><th>Items</th><th>Criteria (mm)</th></tr>
<tr><td>2.0</td><td>Spot defect
 

X
Φ=(X+Y)/2</td><td>① light dot（LCD/TP/Polarizer black/white spot , light dot, pinhole, dent, stain）
<table>
<tr><th rowspan="2">Zone
Size (mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.10</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.10<Φ≤0.15</td><td colspan="2">3(distance≧10mm)</td></tr>
<tr><td>0.15<Φ≤0.2</td><td colspan="2">1</td></tr>
<tr><td>0.2<Φ</td><td colspan="2">0</td></tr>
</table>
②Dim spot（LCD/TP/Polarizer dim dot, light leakage、 dark spot）
<table>
<tr><th rowspan="2">Zone
Size (mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.1</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.1<Φ≤0.2</td><td colspan="2">2(distance≧10mm)</td></tr>
<tr><td>0.2<Φ≤0.3</td><td colspan="2">1</td></tr>
<tr><td>Φ＞0.3</td><td colspan="2">0</td></tr>
</table>
③ Polarizer accidented spot
<table>
<tr><th rowspan="2">Zone
Size (mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.2</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.2<Φ≤0.5</td><td colspan="2">2(distance≧10mm)</td></tr>
<tr><td>Φ>0.5</td><td colspan="2">0</td></tr>
</table></td></tr>
</table>

<table>
<tr>
<td></td>
<td>Line defect (LCD/TP /Polarizer black/white line, scratch, stain)</td>
<td>
<table>
<tr><td rowspan="2">Width(mm)</td><td rowspan="2">Length(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.03</td><td>Ignore</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.03<W≤0.05</td><td>L≤3.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.05<W≤0.08</td><td>L≤2.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.08<W</td><td colspan="4">Define as spot defect</td></tr>
</table>
</td>
</tr>
<tr>
<td>3.0</td>
<td>Polarizer Bubble</td>
<td>
<table>
<tr><td rowspan="2">Zone
Size (mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ<0.2</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.2<Φ<0.4</td><td colspan="2">2(distance≧10mm)</td></tr>
<tr><td>0.4<Φ≤0.6</td><td colspan="2">1</td></tr>
<tr><td>0.6<Φ</td><td colspan="2">0</td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>4.0</td>
<td>SMT</td>
<td>According to IPC-A-610C class Ⅱ standard . Function defect and missing part are major defect ,the others are minor defect.</td>
</tr>
</table>