



**SPECIFICATION  
FOR  
LCD Module  
PV08004TD31C-CO**

<b>MODULE:</b>	
<b>CUSTOMER:</b>	

<b>CUSTOMER</b>	<b>INITIAL</b>	<b>DATE</b>
<b>APPROVED BY</b>		



## REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2020.6.18	-	First Issued.	XIAO



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## 1. General Description

### \* DESCRIPTION

PV08004TD31C-CO is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 8.0" TFT-LCD contains 1200\*1920 pixels, and can display up to 16.7M colors.

### \* Features

- Low Input Voltage: VDD: 1.7-2.0V
- Display Colors of TFT LCD: 16.7M colors
- CPU Interface: MIPI-4 Lanes

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	107.64(H) *172.224(V) (8.0 inch )	mm	-
Driver element	a-Si TFT active matrix	-	-
Display colors	16.7M	colors	-
Number of pixels	1200(RGB) *1920	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.0897(H) *0.0897(V)	mm	-
Viewing angle	ALL	o'clock	-
Drive IC	HX8279-D01	-	-
Display mode	Normally BLACK	-	-
Operating temperature	-0~+50	°C	-
Storage temperature	-20~+60	°C	-

### Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	128.84	-	mm	±0.15
	Vertical(V)	-	205.93	-	mm	±0.15
	Depth(D)	-	3.50	-	mm	±0.25
Weight		-	TBD	-	g	-





### 3. PIN DESCRIPTION

Pin NO.	Symbol	Function
1~3	VLED+	Backlight+
4	NC	Not Connect
5~8	VLED-	Backlight-
9~10	GND	Ground
11	D2+	DSI_D2+ are differential data signal line
12	D2-	DSI_D2- are differential data signal line
13	GND	Ground
14	D1+	DSI_D1+ are differential data signal line
15	D1-	DSI_D1- are differential data signal line
16	GND	Ground
17	CLK+	DSI_DCLK+are differential data signal line
18	CLK-	DSI_DCLK- are differential data signal line
19	GND	Ground
20	D0+	DSI_D0+ are differential data signal line
21	D0-	DSI_D0- are differential data signal line
22	GND	Ground
23	D3+	DSI_D3+ are differential data signal line
24	D3-	DSI_D3- are differential data signal line
25	GND	Ground
26	VDDI	A supply voltage
27	RESET	Hardware reset pin
28	GND	Ground
29	VDDIO	A supply voltage
30	VDD	A supply voltage
31	VDD	A supply voltage

#### TP PIN

Pin NO.	Symbol	Remark
1	SCL	Serial clock input pin
2	VDD2.8V	Power supply
3-4	GND	Ground
5	SDA	Serial data input pin
6	INT	Interrupt pin
7	RST	Reset pin
8	VDDIO1.8V	Power supply



## 4. ELECTRICAL CHARACTERISTICS

### 4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min	Max.		
Supply Voltage for Logic circuit	VDD	-0.3	2.1	V	

### 4.2 DC ELECTRICAL CHARACTERISTICS

#### 4.2.1 OPERATING CONDITIONS

Typical Operating Conditions (Ta=25°C)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Digital Supply Voltage	VDD	1.7	1.8	2.0	V	
VSP Voltage	VSP	4.5	-	6.0	V	
VSN Voltage	VSN	-6.0	-	-4.5	V	
LCM current	I	-	-	130	mA	
TFT Gate ON Voltage	VGH	-	17	-	V	
TFT Gate OFF Voltage	VGL	-	-8	-	V	

#### 4.2.2 BACKLIGHT UNIT (GND=0V)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Forward supply Voltage	V <sub>f</sub>	-	28.8	-	V	
Forward supply Current	I <sub>f</sub>	-	60	-	mA	
LCM Luminance	L <sub>v</sub>	400	450	-	cd/m <sup>2</sup>	I <sub>B</sub> =60mA
Uniformity	/	75			%	-

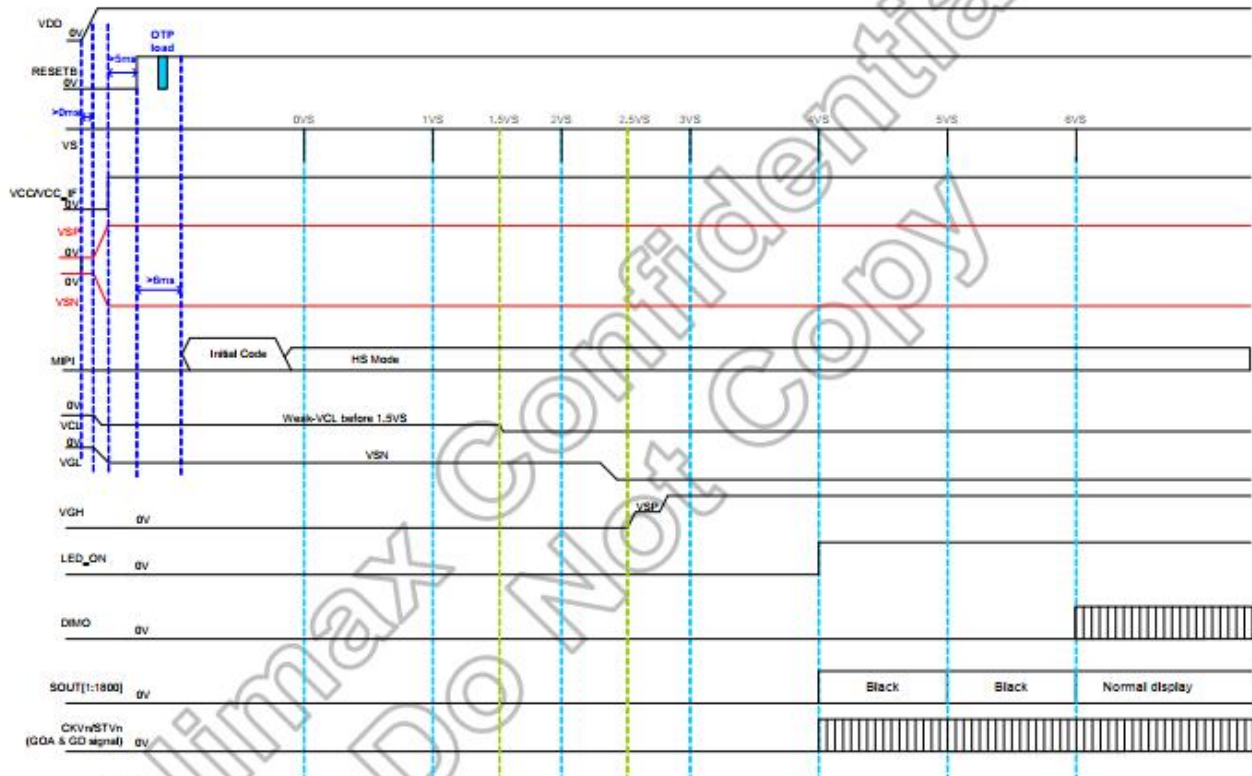


### 4.3 TIMING CHARACTERISTICS

#### 5.4.1 Power on sequence PWRMD=0 → max. Power on time=7VS

After reset state or exit STB mode, the power on sequence will start.

To prevent the device from damage due to latch up, The VGL will be earlier than VGH. At 2.25VS the VGL negative high voltage will be generated via the external charge pump circuit. Then at 2.5VS the VGH positive high voltage can be generated via the external charge pump circuit. One SCHOTTKY diode is necessary between VGL and GND when VDD and VSP start at the same time.



**Note:** (1) Finish to write the GOA MUX (page1 registers) and GOA timing setting (page3 registers) within 50ms after reset pulls to high.

Figure 5.5: Power on sequence with PWRMD=0 and repair OP disable



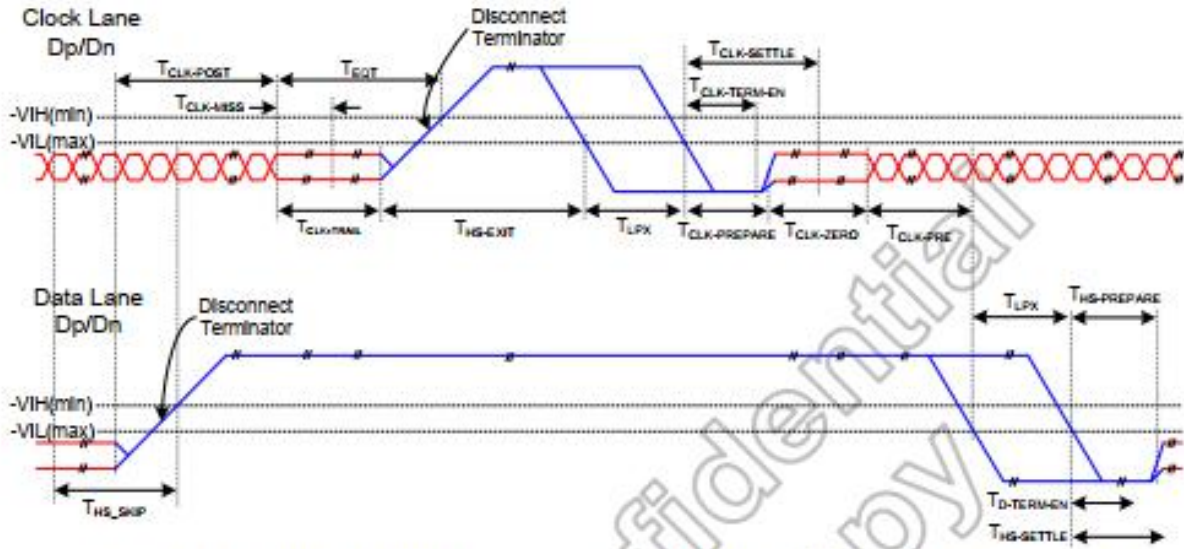


Figure 13.1: Switching the clock lane between clock transmission and low-power mode

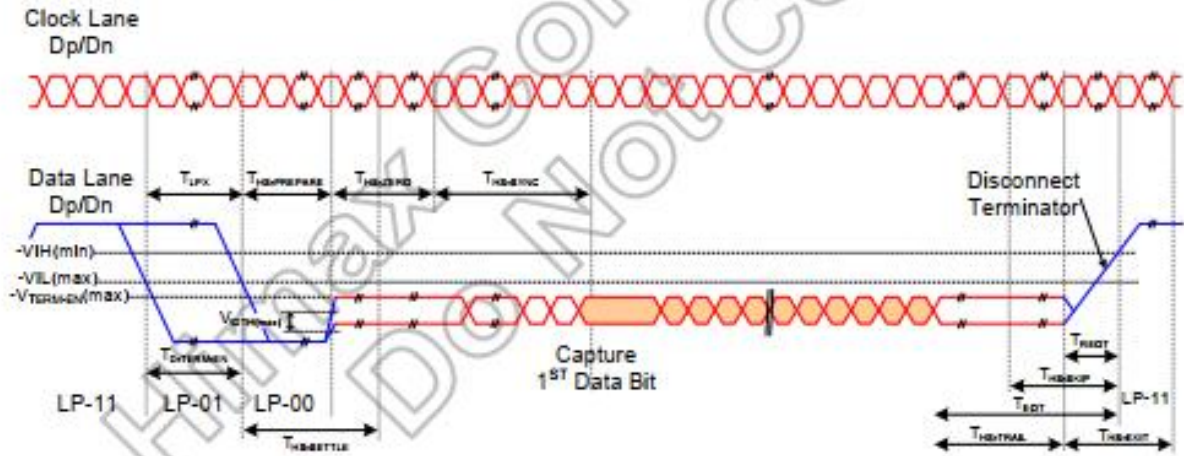


Figure 13.2: Timing of high-speed data transmission in bursts



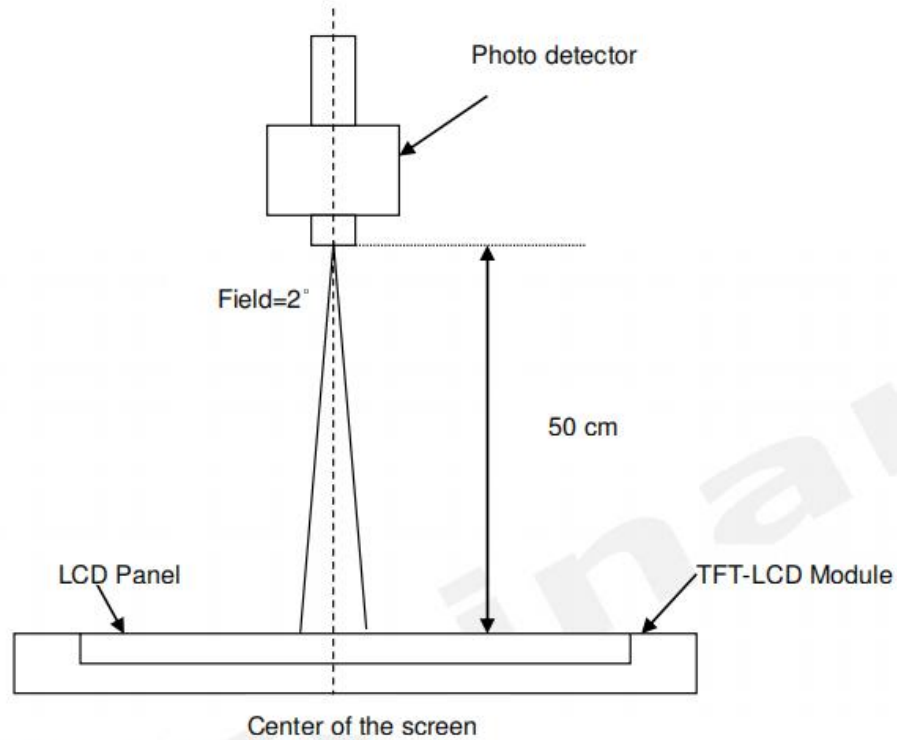
## 5. OPTICAL CHARACTERISTICS

### (LCD MONOMER PARAMETERS)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Viewing Angle	$\theta_R$ $\theta_L$	Horizontal (Right) CR = 10 (Left)	80 80	85 85	- -	degree	1, 6
	$\psi_H$ $\psi_L$	Vertical (Upper) CR = 10 (Lower)	80 80	85 85	- -		
Contrast Ratio	CR		-	900	-		1, 3
Cross talk	%		---	---	4		1, 4
Response Time	$T_{RT}$	Rising + Falling	-	27	35	msec	5
Color / Chromaticity Coordinates	Red	Rx	0.603	0.633	0.663	CIE 1931	Base on C-light
		Ry	0.310	0.340	0.370		
	Green	Gx	0.259	0.289	0.319		
		Gy	0.553	0.583	0.613		
	Blue	Bx	0.103	0.133	0.163		
		By	0.148	0.178	0.208		
	White	Wx	0.291	0.321	0.351		
		Wy	0.337	0.367	0.397		
NTSC	%	-	-	55.7	-		
Transmittance	%		3.43	3.90	NA		

**Note 1:** Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room, and it should be measured in the center of screen.



**Note 2 :** Definition of Average Luminance of White ( $Y_L$ ):



## 6. QUALITY SPECIFICATIONS

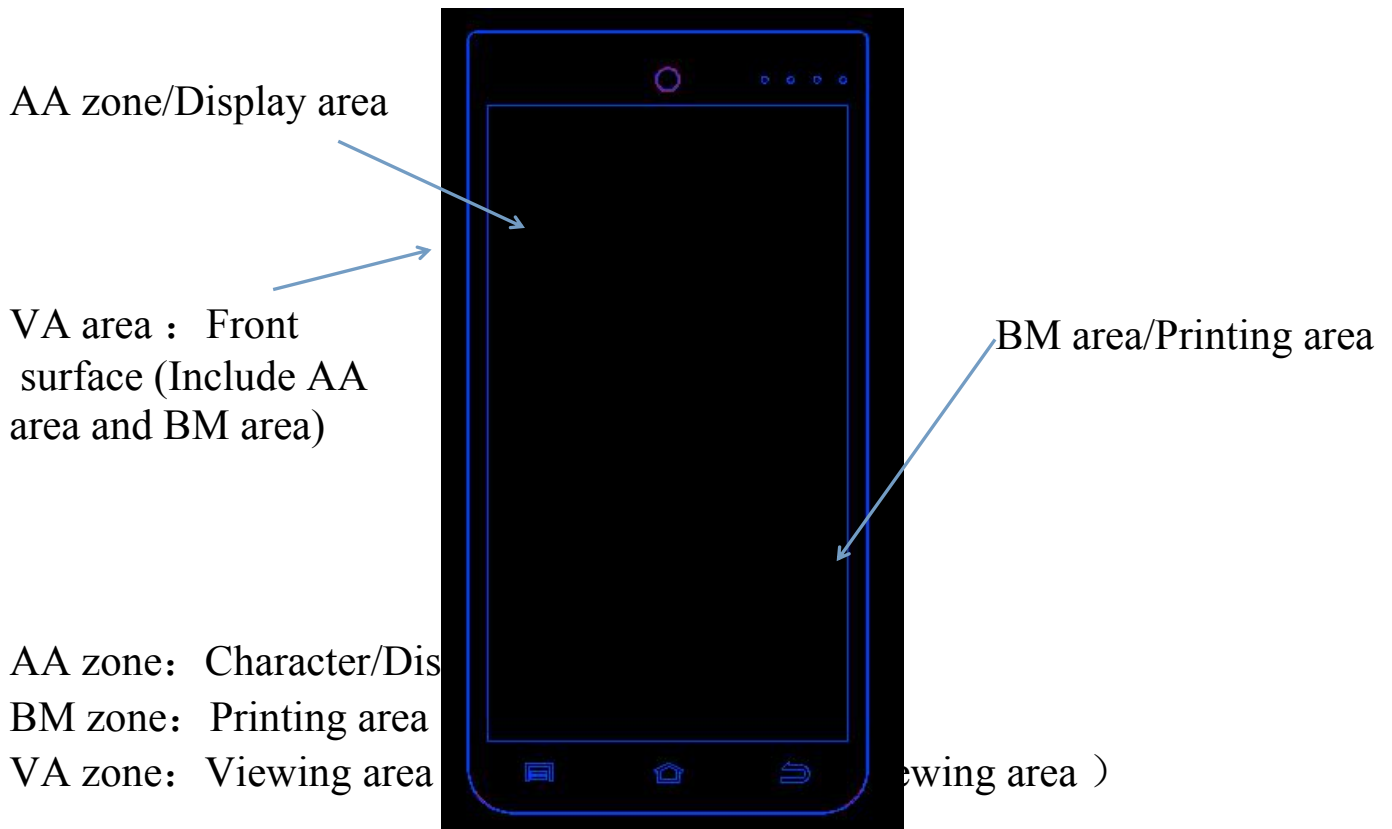
### 1. Inspection condition

6.1.1:Cosmetic inspection: viewing distance is about 30cm with bare eyes, and under an environment of 20~40W light intensity ( 600~1200LUX ) , all directions for inspecting the sample should be within 45° against perpendicular line.

6.1.2:Function inspection: viewing distance is about 30cm with bare eyes, and under an environment of 300LUX light intensity, all directions for inspecting the sample should be within 45° against perpendicular line.

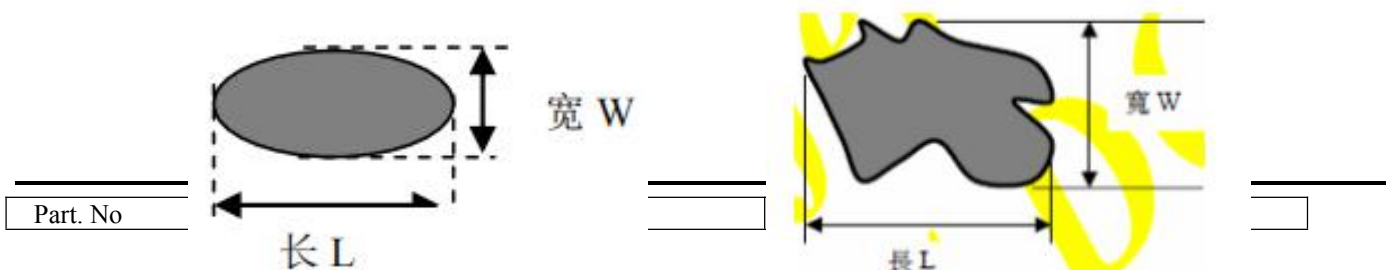
### 2. Definition of Inspection Item.

#### 2.1 Definition of Inspection zone in I-touch module.



### 3. Defect definition

#### 3.1 Circular defect



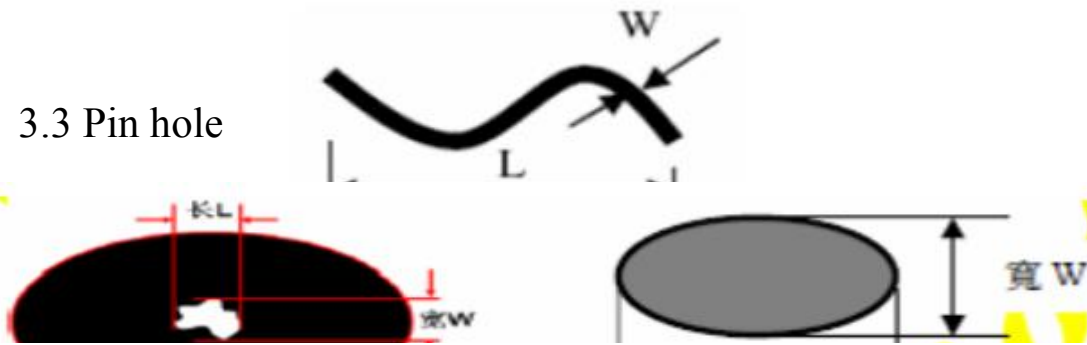


Diameter  $\Phi=1/2(L+W)$

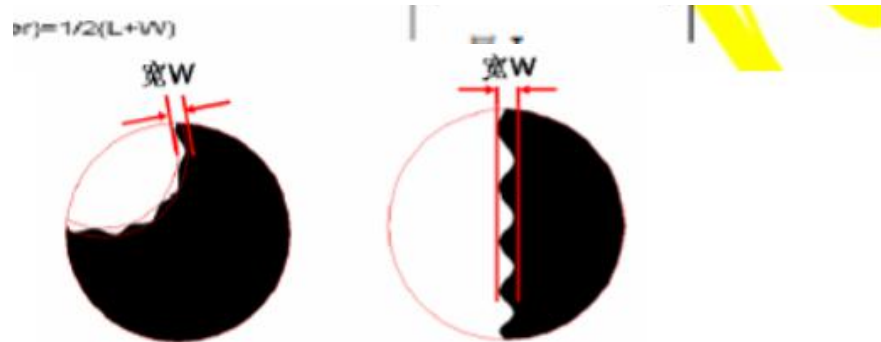
Diameter  $\Phi=1/2(L+W)$

### 3.2 Linear defect

### 3.3 Pin hole



### 3.4 Zigzag



## 4. Inspection

## standards

### 4.1 Major defect

-Item -No	Items to be inspected	Inspection Standard	Classification of defects
4.1.1	All functional defects	1) No display 2) Display abnormally 3) Missing vertical, horizontal segment 4) Short circuit 5) Back-light no lighting, flickering and abnormal lighting. 6) Touch panel abnormal.	Major
4.1.2	Missing	Missing component	
4.1.3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.	
4.1.4	LCD Mura	LCD Mura according to ND 5% keep out to determine, if keep out distance at 30cm be seen by eyes is NG, otherwise will be ok if invisible.	



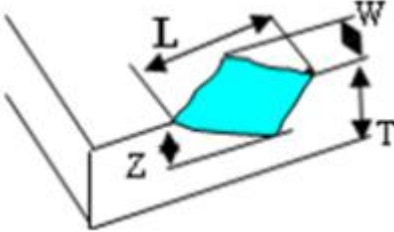

### 4.2 Cosmetic defect

Item No	Items to be inspected	Inspection Standard		Classification of defects
4.2.1	Dot defect	Zone Size(mm)	VA area	Minor
			Acceptable Qty	
		$\Phi \leq 0.1$	Ignore	
		$0.10 < \Phi \leq 0.25$	3	
		$0.25 < \Phi \leq 0.30$	1	
		$0.30 < \Phi$	0	
4.2.2	Dim Spots: Circle shaped and dim edged defects	Zone Size(mm)	VA area	Minor
			Acceptable Qty	
		$\Phi \leq 0.20$	Ignore	
		$0.20 < \Phi \leq 0.40$	3	
		$0.40 < \Phi \leq 0.60$	2	
		$0.60 < \Phi$	0	
Item No	Items to be inspected	Inspection Standard		Classification of defects
4.2.3	Dent Spot Fish eye	Zone Size(mm)	VA area	Minor
			Acceptable Qty	
		$\Phi \leq 0.10$	Ignore	
		$0.10 < \Phi \leq 0.20$	3	
		$0.20 < \Phi \leq 0.30$	2	
		$0.30 < \Phi$	0	





4.2.4	Line defect	Zone		VA area	Minor
		Size(mm)			
		L ( Length )	W ( Width )	Acceptable Qty	
		Ignore	$W \leq 0.03$	Ignore	
		$L \leq 5.0$	$0.03 < W \leq 0.05$	3	
		$L \leq 3.0$	$0.05 < W \leq 0.07$	1	
/	$0.07 < W$	Define as spot defect			
4.2.5	Scratch	<p>If the scratch can be seen after mobile phone cover assembling or in the operating condition, judged as the line defect of 4.2.4.</p> <p>If the scratch can be seen only in non-operating condition or some special angle, judged as the following table.</p>			Minor
		Size (mm)		VA area	
		L ( Length )	Acceptable Qty	Acceptable Qty	
		Ignore	$W \leq 0.03$	Ignore	
		$5.0 < L \leq 10.0$	$0.03 < W \leq 0.05$	2	
		$L \leq 5.0$	$0.05 < W \leq 0.08$	1	
		/	$W > 0.08$	0	



Item No	Items to be inspected	Inspection Standard	Classification of defect												
4.2.6	Bubble	<table border="1"> <thead> <tr> <th data-bbox="491 309 852 434">Zone Size(mm)</th> <th colspan="2" data-bbox="855 309 1212 434">VA area Acceptable Qty</th> </tr> </thead> <tbody> <tr> <td data-bbox="491 439 852 495"><math>\Phi \leq 0.15</math></td> <td colspan="2" data-bbox="855 439 1212 495">Ignore</td> </tr> <tr> <td data-bbox="491 499 852 555"><math>0.15 &lt; \Phi \leq 0.25</math></td> <td colspan="2" data-bbox="855 499 1212 555">2</td> </tr> <tr> <td data-bbox="491 560 852 616"><math>0.25 &lt; \Phi</math></td> <td colspan="2" data-bbox="855 560 1212 616">0</td> </tr> </tbody> </table>	Zone Size(mm)	VA area Acceptable Qty		$\Phi \leq 0.15$	Ignore		$0.15 < \Phi \leq 0.25$	2		$0.25 < \Phi$	0		
Zone Size(mm)	VA area Acceptable Qty														
$\Phi \leq 0.15$	Ignore														
$0.15 < \Phi \leq 0.25$	2														
$0.25 < \Phi$	0														
4.2.7	Glass defect	<p data-bbox="491 685 906 719">4.2.7a Chip on corner or surface</p>  <table border="1" data-bbox="491 1043 1209 1200"> <thead> <tr> <th data-bbox="491 1043 730 1122">L(length)</th> <th data-bbox="734 1043 970 1122">W(width)</th> <th data-bbox="973 1043 1209 1122">Z(thickness)</th> </tr> </thead> <tbody> <tr> <td data-bbox="491 1126 730 1200"><math>L \leq 0.30</math></td> <td data-bbox="734 1126 970 1200"><math>W \leq 0.20</math></td> <td data-bbox="973 1126 1209 1200">T/2</td> </tr> </tbody> </table> <p data-bbox="491 1279 1134 1357">Notes: T=Lens thickness, <math>\Phi \leq 0.10</math> ignore Acceptable Qty: Single edge <math>N \leq 2</math>, Total <math>N \leq 4</math></p> <p data-bbox="491 1458 1007 1525">4.2.7b Cracks Cracks tend to break are not allowed.</p> 	L(length)	W(width)	Z(thickness)	$L \leq 0.30$	$W \leq 0.20$	T/2	Minor						
L(length)	W(width)	Z(thickness)													
$L \leq 0.30$	$W \leq 0.20$	T/2													






Item No	Items to be inspected	Inspection Standard	Classification of defect
4.2.8	Parts alignment	1) Not allow IC and FPC/heat-seal lead width is more than 50% beyond lead pattern. 2) Not allow chip or solder component is off center more than 50% of the pad outline.	Minor
4.2.9 view area/ printing area of front surface and view area of rear surface	LOGO Pattern	 <p><b>Dot: according to Dot spec.</b>  <b>Thickness odds:</b></p> $\frac{ \text{Spec pattern width} - \text{Print pattern width}  \times 100\%}{\text{Spec pattern width}} \leq 30\%$ <p><b>Drawing slant:</b></p> <p>Print pattern length <math>\leq 10\text{mm}</math>, slant angle <math>\leq 3^\circ</math> ;                      10mm &lt; Print pattern length <math>\leq 20\text{mm}</math>, slant angle <math>\leq 1.5^\circ</math></p>  <p><b>Pattern serration:</b> <math>H \leq 0.05 \text{ mm}</math></p> <p><b>Pattern leak print/ error/overprint:</b> not allowed</p> <p><b>Pattern break line:</b> width <math>\leq 0.10 \text{ mm}</math></p> <p><b>Logo pattern color windage / color thin:</b> Follow the limit samples.</p>	Minor

Item No	Items to be inspected	Inspection Standard	Classification of defects
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4.2.10 view area/print ing area of front surface and view area of rear surface	IR hole(A)/ Light sensor hole(B)/ LED hole(C)	 <ol style="list-style-type: none"> <li>1. A.B.C hole must be according the transmittancy</li> <li>2. Light leakage on A.B.C hole or follow the limited sample.</li> <li>3. A.B.C hole (LED) hole only judge by black background, no need to check in the lamb condition.</li> </ol>	Minor
	Surface dirty	<ol style="list-style-type: none"> <li>1. Dirty can not be cleaned follow the dot spec.</li> <li>2. Accept while the dirty can be cleaned.</li> <li>3. The quality guarantee period of protective film is 3months, during the period, the spot or contamination is not allowed.</li> </ol>	
	Printing area Light leakage	Follow the dot defect spec, MAX, Severity - see light leakage limit sample	
	Ink overflow	Visual inspection 30cm not allowed	
	Color discordant	Obvious color difference in the BM area is not allowed	
	Icon scratch of printing logo area	Icon printing logo area is not allow penetrability scratch	



## 7. RELIABILITY

Test Item	Test Condition
High Temperature Operation	50°C for 96 hours
Low Temperature Operation	0°C for 96 hours
High Temperature Storage	60°C for 96 hours
Low Temperature Storage	-20°C for 96 hours
High Temperature Operation Humidity Operation	60°C, 90%RH for 72 hours
Thermal Shock	-10°C (30min) ~+25°C (5min)~ +60°C (30min) for 10 cycles



## 8. HANDLING PRECAUTION

### 8.1 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.

### 8.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is  $23\pm 5^{\circ}\text{C}$  and the humidity is below  $50\pm 20\%\text{RH}$ .
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

### 8.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.

### 8.4 WARRANTY

- 1) The period is within twelve months since the date of shipping out under normal using and storage conditions.
- 2) According to KINGTECH TFT LCD quality standard, KINGTECH will rework or exchange for functional defect goods since within one year.

## 9. PACKAGE DRAWING

TBD