



**SPECIFICATION  
FOR  
LCD Module  
PV07040T0240R**

<b>MODULE:</b>	PV07040T0240R
<b>CUSTOMER:</b>	

<b>KT</b>	<b>INITIAL</b>	<b>DATE</b>
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<b>CUSTOMER</b>	<b>INITIAL</b>	<b>DATE</b>



## REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2022.06.11	-	First Issued.	YANG



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## 1. General Description

### \* DESCRIPTION

PV07040T0240R 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 7.0" TFT-LCD contains 800\*1280 pixels, and can display up to 16.7M colors.

### \* Features

- Low Input Voltage: VDD: 3.3V
- Display Colors of TFT LCD: 16.7M colors
- CPU Interface: MIPI-4 Lanes

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	94.2(H) *150.72(V) (7.0 inch )	mm	-
Driver element	a-Si TFT active matrix	-	-
Display colors	16.7M	colors	-
Number of pixels	800(RGB) *1280	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.11775(H) x 0.11775(V)	mm	-
Viewing angle	ALL	o'clock	-
Drive IC	JD9365DA-H3	-	-
Display mode	Normally BLACK	-	-
Operating temperature	-10~+60	°C	-
Storage temperature	-20~+70	°C	-

### Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	99.59	-	mm	±0.2
	Vertical(V)	-	160.88	-	mm	±0.2
	Depth(D)	-	2.33	-	mm	±0.2
Weight		-	TBD	-	g	-





### 3. PIN DESCRIPTION

Pin NO.	Symbol	Function
1-2	VDD3.3V	A supply voltage 3.3V
3	GND	Ground
4	RESET3.3	Hardware reset pin
5	GND	Ground
6	D0N	DSI_D0- are differential data signal line
7	D0P	DSI_D0+ are differential data signal line
8	GND	Ground
9	D1N	DSI_D1- are differential data signal line
10	D1P	DSI_D1+ are differential data signal line
11	GND	Ground
12	CLKN	DSI_DCLK- are differential data signal line
13	CLKP	DSI_DCLK+ are differential data signal line
14	GND	Ground
15	D2N	DSI_D2- are differential data signal line
16	D2P	DSI_D2+ are differential data signal line
17	GND	Ground
18	D3N	DSI_D3- are differential data signal line
19	D3P	DSI_D3+ are differential data signal line
20	GND	Ground
21	PWMO	PWM signal
22	GND	Ground
23	LEDK	Backlight Cathode
24	LEDK	Backlight Cathode
25	GND	Ground
26	AVEE	A supply voltage
27	NC	Not Connect
28	NC	Not Connect
29	AVDD	A supply voltage
30	LEDA	Backlight Anode
31	LEDA	Backlight Anode
32	NC	Not Connect
33	GND	Ground
34	TP IOVCC1.8	NC
35	TP VDD3.3	NC
36	GND	Ground
37	TP RST 1.8V	NC
38	TP SCL 1.8V	NC
39	TP SDA 1.8V	NC
40	TP INT 1.8V	NC



## 4. ELECTRICAL CHARACTERISTICS

### 4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min	Max.		
Supply Voltage for Logic circuit	VDD	-0.3	6.6	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	2.5	3.3	3.6		
LCM current	I	-	25	-	mA	
TFT Gate ON Voltage	VGH	-	15	-	V	
TFT Gate OFF Voltage	VGL	-	-10	-	V	

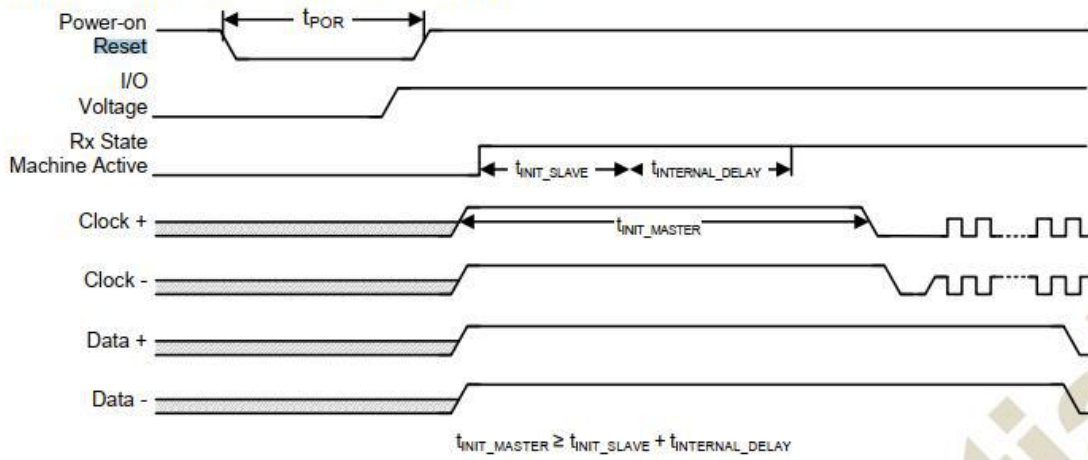
#### 4.2.2 BACKLIGHT UNIT (GND=0V)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Forward supply Voltage	V <sub>f</sub>	21.6	-	26.4	V	
Forward supply Current	I <sub>f</sub>	-	100	-	mA	
LCM Luminance	LV	1000	1100	-	cd/m <sup>2</sup>	I <sub>B</sub> =100mA
Uniformity	/	75			%	-



## 4.3 TIMING CHARACTERISTICS

### 7.1.2. Power-up Sequence Example



Any derive state except LP-11, LP-10 or LP-01

**Figure 7.3: Peripheral Power-Up Sequencing Example**





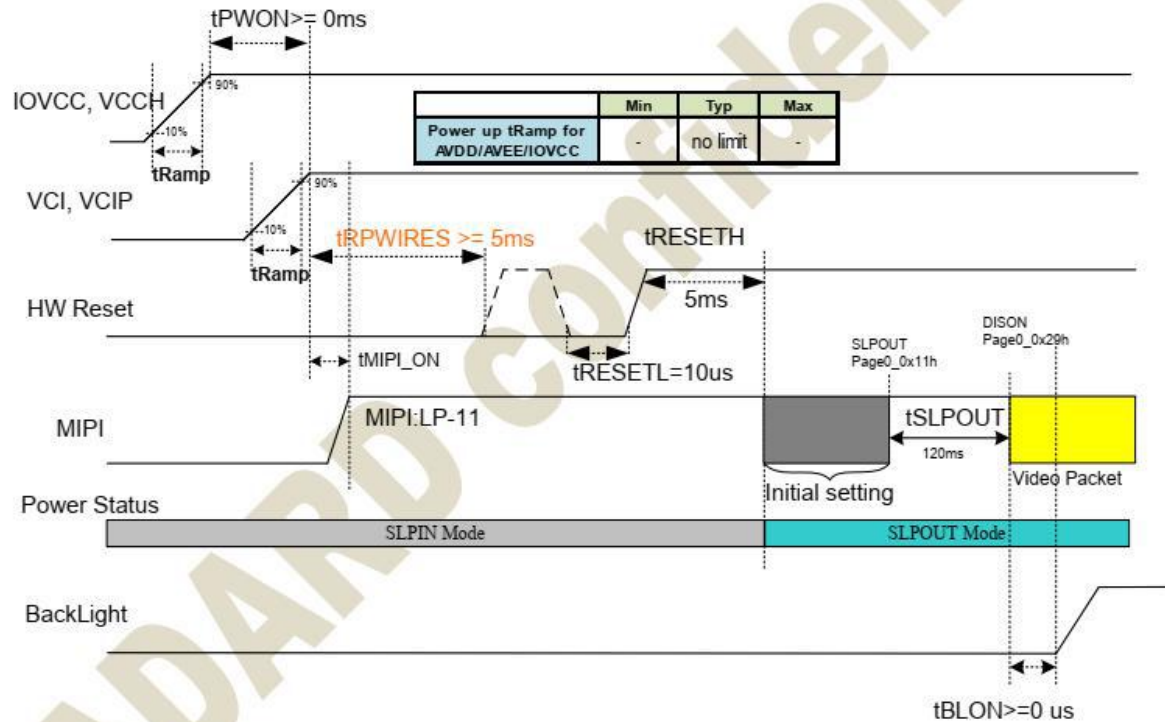
### 9.5.2. Power on sequence for differential power mode

Symbol	Min	Typ	Max	Unit	Remark
tRamp	-	no limit	-	us	
tPWON	0	-	-	ms	
tONI	0	-	-	ms	
tMIPI-ON	0	-	tRPWIRES	ms	
tRPWIRES	5	-	-	ms	
tRESETL	10	-	-	us	
tRESETH	5	-	-	ms	
tSLPOUT	120	-	-	ms	
tBLON	0	-	-	ms	

BOOSTM[1:0]=10 (Internal DC/DC power mode : Charge Pump, FP7721)

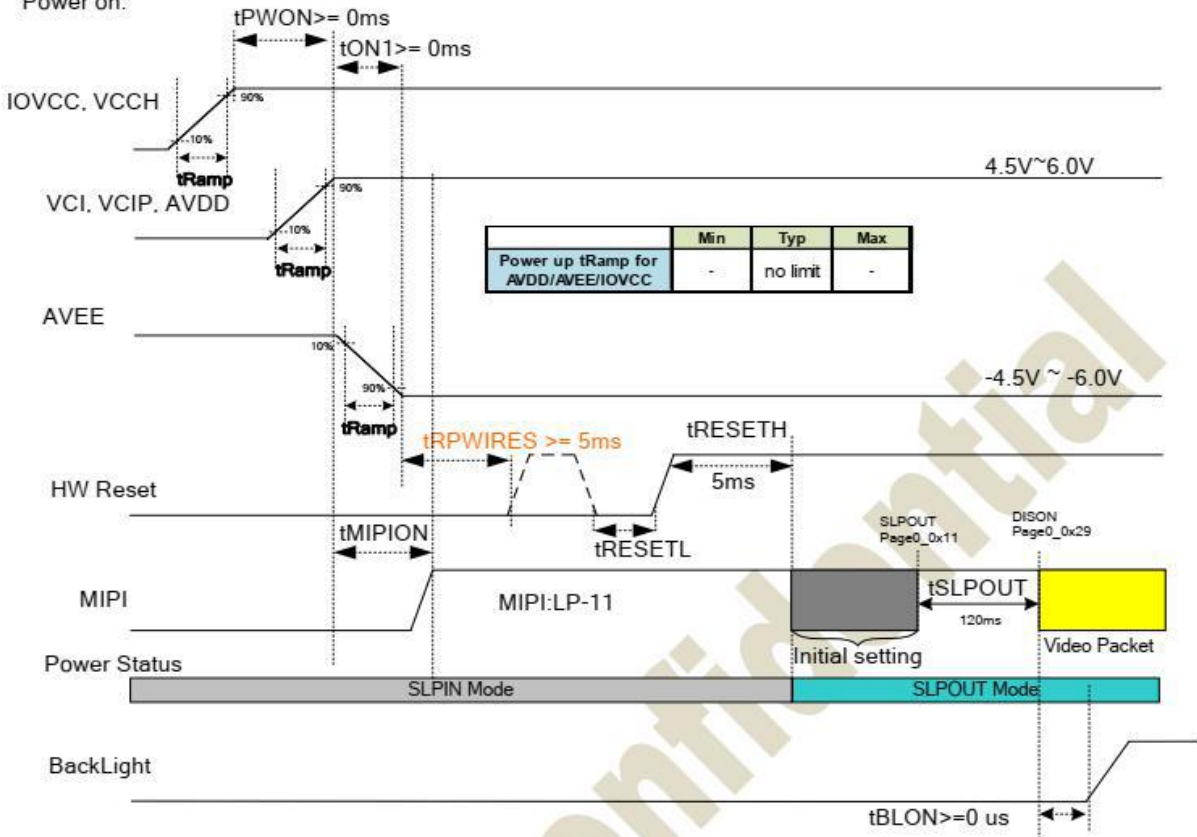
VCCD=IOVCC=VCCH=1.65V ~ 3.6V, VCI=VCIP=2.5V ~ 4.8V.

Power on:





BOOSTM[1:0]=01/11 (External AVDD/AVEE Power)  
 VCCD=IOVCC=VCCH=1.65V ~ 3.6V, AVDD=VCI=VCIP=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V  
 Power on:



BOOSTM[1:0]=00 (External AVDD/AVEE/VGH/VGL)  
 IOVCC=VCCH=1.65V ~ 3.6V, VCI=VCIP=AVDD=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V, VGH=7V~20V, VGL=-7V~-15V  
 Power on:

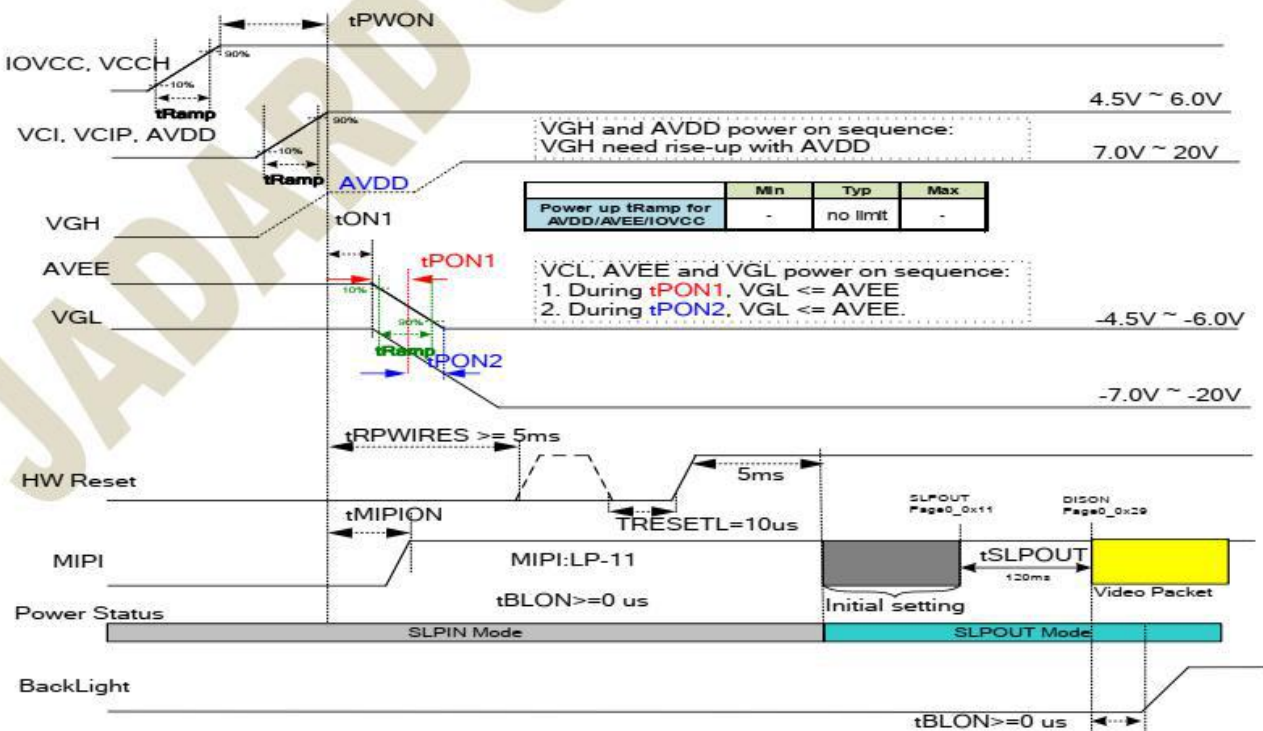


Figure 9.10: Power off sequence for differential power mode



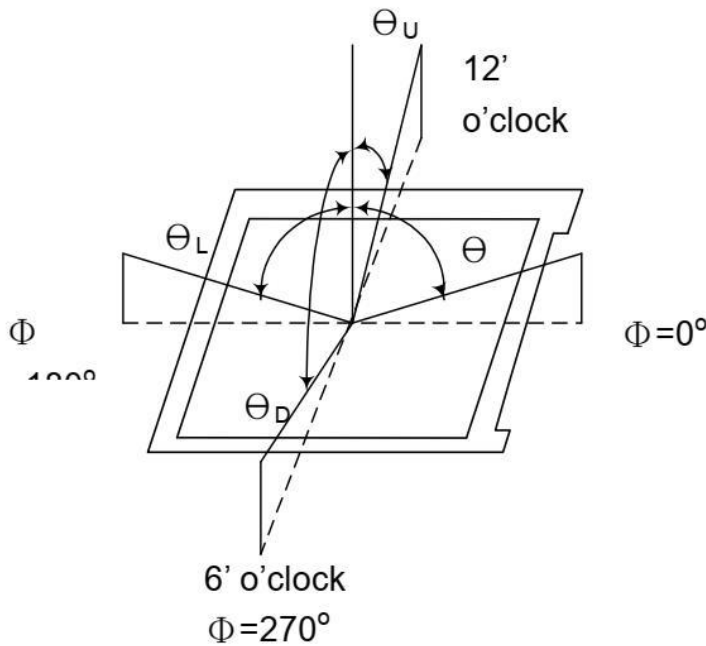
## 5.OPTICAL CHARACTERISTICS

### (LCD MONOMER PARAMETERS)

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (with Polarizer)		T (%)	Θ=0 Normal viewing angle	4.62	5.14	—	%	Measuring with Polarizer , Reference Only
Transmittance (without Polarizer)		T (%)		—	13.9	—	%	
Contrast		CR		600	800	—	—	(1)(2)
Response time		T <sub>R</sub>		—	10	15	msec	(1)(3)
		T <sub>F</sub>		—	20	25		
Color gamut	(%)		—	60	—	%	C-light	
Color chromaticity (CIE1931)	White	W <sub>x</sub>	-0.03	+0.03	(0.319)	—	(1)(4) CF glass	
		W <sub>y</sub>			(0.346)			
	Red	R <sub>x</sub>			TBD			—
		R <sub>y</sub>			TBD			—
	Green	G <sub>x</sub>			TBD			—
		G <sub>y</sub>			TBD			—
	Blue	B <sub>x</sub>			TBD			—
		B <sub>y</sub>			TBD			—
Viewing angle	Hor.	Θ <sub>L</sub>	CR>10	—	85	—	—	(1)(4) Measuring with Polarizer , Reference Only
		Θ <sub>R</sub>		—	85	—		
	Ver.	Θ <sub>U</sub>		—	85	—		
		Θ <sub>D</sub>		—	85	—		
Optima View Direction				Free				(5)



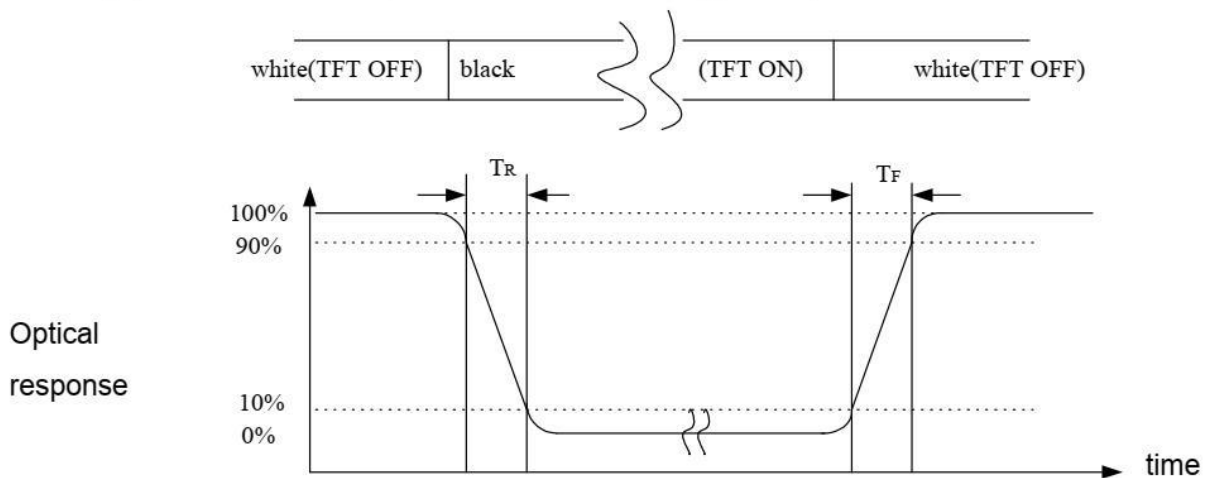
Note (1) Definition of Viewing Angle:



Note (2) Definition of Contrast Ratio (CR) :  
measured at the center point of panel

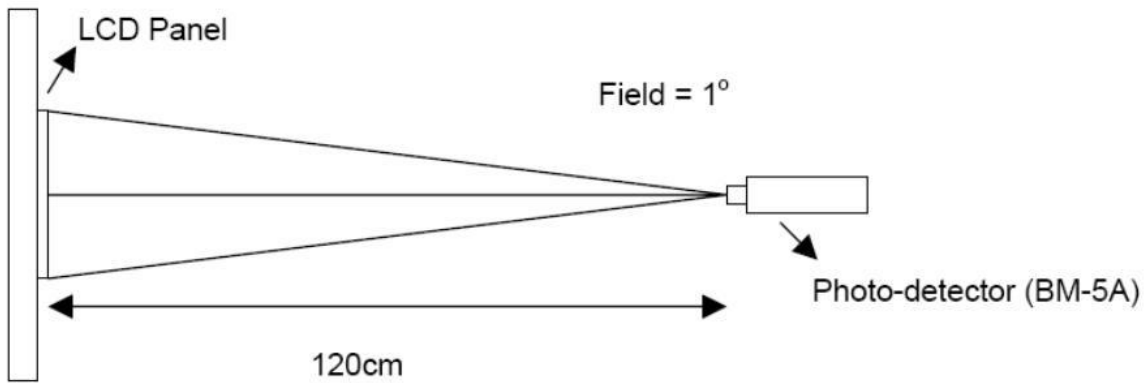
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of  $T_R$  and  $T_F$

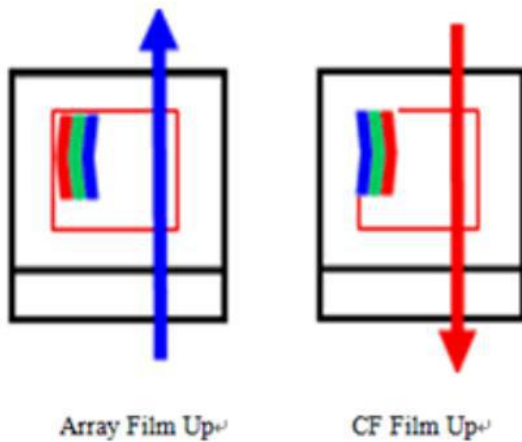




#### Note (4) Definition of optical measurement setup



#### Note (5) Rubbing Direction (The different Rubbing Direction will cause the different optima view direction. )

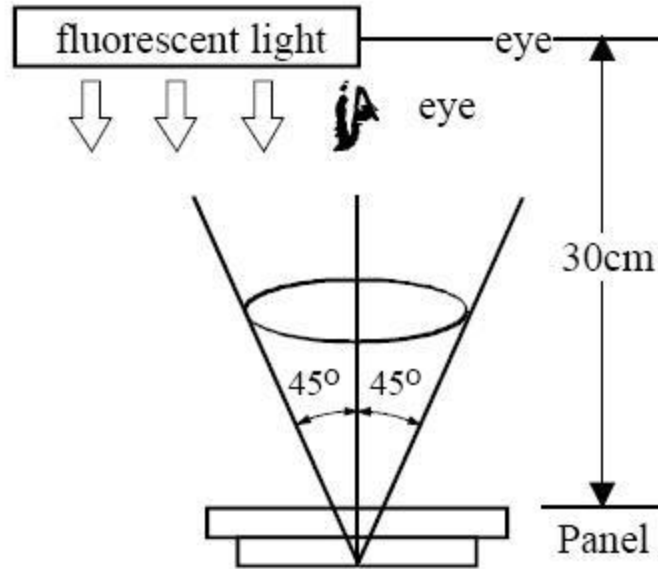




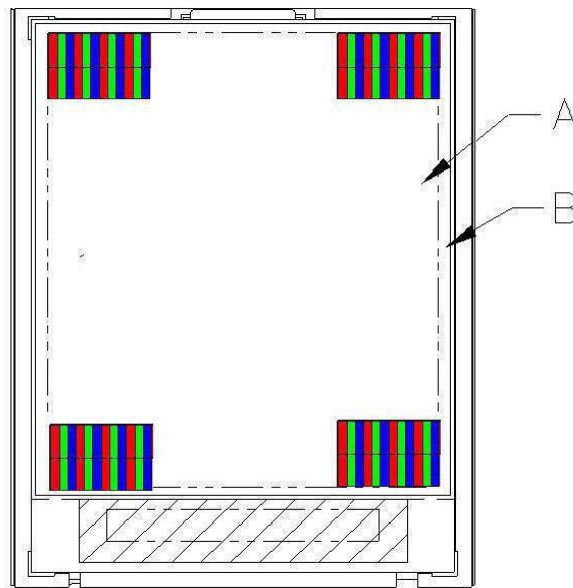
## 6. QUALITY SPECIFICATIONS

### 6.1 INSPECTION CONDITION

- (1) Inspect under 800-1200Lux fluorescent light, leaving 30~35cm between panels and eyes, and between panels and lights.
- (2) Inspection condition is  $23\pm 5^{\circ}\text{C}$ ,  $50\pm 20\%RH$  maximum.



### 6.2 DEFINITION OF AREA





A Area : Viewing area.


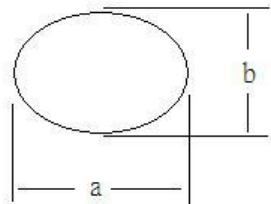
B Area : Out of viewing.(outside viewing area)



**6.3 INSPECTION SPECIFICATION**

NO	Item	Acceptable specification	Judgment Criterion
1	Electrical Testing	<p><b>1-1 sub pixel classification</b></p> <ul style="list-style-type: none"> <li>Sub Pixel: Number of sub pixel doesn't exceed two dot.</li> </ul> <div style="display: flex; align-items: center; margin: 10px 0;">  <div style="margin-left: 10px;">Sub Pixel (Dot)</div> </div> <p>a&gt; Dark dot ----two Allowed b&gt; Bright dot ---- two Allowed</p> <ul style="list-style-type: none"> <li>Pixel : Three dots link together doesn't exceed twos</li> </ul> <div style="display: flex; align-items: center; margin: 10px 0;">  <div style="margin-left: 10px;">Pixel</div> </div> <p><b>1-2 Leakage to light</b></p> <ul style="list-style-type: none"> <li>Leakage to light be not allowed.</li> </ul> <p><b>1-3 Picture to shake</b></p> <ul style="list-style-type: none"> <li>Picture had shake, twinkle and noise etc. instable of defect that be not allowed.</li> </ul> <p><b>1-4 Function</b></p> <ul style="list-style-type: none"> <li>No display or No function.</li> <li>Source Line, Gate Line.</li> <li>Contrast Ratio</li> <li>Current consumption exceeds product specifications.</li> <li>Display malfunction.</li> </ul>	<p><math>N \leq 2</math></p> <p><math>N \leq 2</math></p> <p><math>N=0</math></p> <p><math>N=0</math></p> <p><math>N=0</math></p>
2	Mechanical Dimension	<p>2-1 Mechanical Dimension exceeds product specifications.</p> <p>2-2 Out of frame and boss of plastic changed shape that be not allowed.</p>	<p><math>N=0</math></p>



NO	Item	Acceptable specification	Judgment Criterion																		
3	Cosmetic Inspection	<p><b>3-1 Blemish: Line shapes of defect</b></p> <table border="1"> <thead> <tr> <th>Length</th> <th>Width</th> <th>Acceptable number</th> <th>Mini. space</th> </tr> </thead> <tbody> <tr> <td>---</td> <td><math>W \leq 0.08</math></td> <td>Ignore</td> <td rowspan="3">10MM</td> </tr> <tr> <td><math>L \leq 10MM</math></td> <td><math>0.08 &lt; W \leq 0.10</math></td> <td>3</td> </tr> <tr> <td><math>L \leq 10MM</math></td> <td><math>0.10 &lt; W \leq 0.20</math></td> <td>1</td> </tr> <tr> <td>--</td> <td><math>W &gt; 0.20</math></td> <td>Not allowed</td> <td>---</td> </tr> </tbody> </table> <p>L: length(mm) W: width(mm)</p> 	Length	Width	Acceptable number	Mini. space	---	$W \leq 0.08$	Ignore	10MM	$L \leq 10MM$	$0.08 < W \leq 0.10$	3	$L \leq 10MM$	$0.10 < W \leq 0.20$	1	--	$W > 0.20$	Not allowed	---	
		Length	Width	Acceptable number	Mini. space																
		---	$W \leq 0.08$	Ignore	10MM																
		$L \leq 10MM$	$0.08 < W \leq 0.10$	3																	
		$L \leq 10MM$	$0.10 < W \leq 0.20$	1																	
		--	$W > 0.20$	Not allowed	---																
		<p><b>3-2 Blemish: dot shapes of defect.</b></p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Mini. Space</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.20</math></td> <td>Ignore</td> <td>---</td> </tr> <tr> <td><math>0.20 &lt; \Phi \leq 0.25</math></td> <td>3</td> <td rowspan="2">5 m m</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.35</math></td> <td>2</td> </tr> <tr> <td><math>\Phi &gt; 0.35</math></td> <td>0</td> <td>---</td> </tr> </tbody> </table>	Dimension	Acceptable number	Mini. Space	$\Phi \leq 0.20$	Ignore	---	$0.20 < \Phi \leq 0.25$	3	5 m m	$0.25 < \Phi \leq 0.35$	2	$\Phi > 0.35$	0	---					
		Dimension	Acceptable number	Mini. Space																	
		$\Phi \leq 0.20$	Ignore	---																	
		$0.20 < \Phi \leq 0.25$	3	5 m m																	
$0.25 < \Phi \leq 0.35$	2																				
$\Phi > 0.35$	0	---																			
<p><b>3-3 Polarizer Bubble</b></p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Mini. Space</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.30</math></td> <td>Ignore</td> <td>---</td> </tr> <tr> <td><math>0.30 &lt; \Phi \leq 0.40</math></td> <td>4</td> <td>15 m m</td> </tr> <tr> <td><math>\Phi &gt; 0.40</math></td> <td>0</td> <td>---</td> </tr> </tbody> </table>	Dimension	Acceptable number	Mini. Space	$\Phi \leq 0.30$	Ignore	---	$0.30 < \Phi \leq 0.40$	4	15 m m	$\Phi > 0.40$	0	---									
Dimension	Acceptable number	Mini. Space																			
$\Phi \leq 0.30$	Ignore	---																			
$0.30 < \Phi \leq 0.40$	4	15 m m																			
$\Phi > 0.40$	0	---																			
<p>Foreign Substances</p>  <p style="text-align: right;"><math>\Phi = (a+b)/2</math></p>																					





NO	Item	Acceptable specification	Judgment Criterion			
3	Cosmetic Inspection	<b>3-4 Scratch</b> <ul style="list-style-type: none"> <li>● Sensate scratch not allowed.</li> <li>● Impassive scratch as below.</li> </ul> <p style="text-align: right; color: red;">Unit:mm</p>				
		Length		Width	Acceptable number	Mini. space
		-----		$W \leq 0.08$	Ignore	10 m m
		$L \leq 10$		$0.08 < W \leq 0.10$	5	
		$L \leq 10$		$0.10 < W \leq 0.18$	4	
		----		$0.18 < W$	Not allowed	---
		$L > 3.5$		----	Not allowed	
4	Package	4-1 Mixed product types 4-2 Shipping q'ty should be the same as "shipping notice form" q'ty. 4-3 Outer box can't broken.	N=0			
5	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				



## 7. RELIABILITY

High Temperature Operation	70°C for 96 hours	<p>Inspection after 2~4hours storage at room temperature, the sample shall be free from defects:</p> <p>试验结束后, 已测试的 LCD 样品必须在室内正常温湿度环境下放置 2~4 个小时以上才能进行功能和外观检查, 样品不允许有以下缺陷:</p> <p>1. 无功能不良, 例: 缺划, 显异, 严重爆灯等</p> <p>2. 外观无偏光片气泡, OCA 气泡等不良:</p> <p>2. The test samples should be applied to only one test item. 每个被测试的模块只能用于其中的一个测试项目。</p>
Low Temperature Operation	-20°C for 96 hours	
High Temperature Storage	80°C for 96 hours	
Low Temperature Storage	-30°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	
Vibration Test (No Operation)	Frequency: 10~55Hz Amplitude:1.0mm Sweep Time: 11min Test Period: 6 Cycles for each direction of X, Y, Z	
Static electricity test	Touch ±4KV, air touch ±8KV	



## 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) Under normal use and storage conditions, it is within 12 months from the date of delivery. 在正常使用和储存条件下，自交货之日起12个月内。
- 2) According to Kingtech TFT LCD quality standard, Kingtech will rework or exchange for functional defect goods since within one year. 依据Kingtech TFT LCD质量标准，Kingtech将在一年内保修或置换功能缺陷产品。
- 3) strictly prohibit the display in the whole machine for a long time point a fixed screen (display by the LCD residual shadow determination criteria); suggest that the entire machine more than 2 minutes without the use of LCM automatically into hibernation, more than 30 minutes without the use of the system to force LCM into hibernation. 严禁显示屏在整机长期点一个固定画面（显示屏依LCD残影判定标准）；建议整机超过2分钟不使用LCM自动进入休眠，超过30分钟不使用系统强制LCM进入休眠状态。
- 3) Display is strictly prohibited to work continuously for more than 8 hours on the whole



machine. 严禁显示屏在整机连续工作8小时以上。

- 4) Please take the module under static protection. 请在有静电防护情况下，拿取模组。
- 5) LCM in special scenarios (such as high concentration of chemicals, strong magnetic field, extreme cold, and other use scenarios) use in advance to contact us to confirm. LCM在特殊场景（比如高浓度化学品，强磁场，极寒等使用场景）使用时提前联系我们确认。

## 9. PACKAGE DRAWING

TBD