



**SPECIFICATION
FOR
LCD Module
PV10108TD31F-C**

KINGTECH	INITIAL	DATE
PREPARED BY		2018.12.9
CHECKED BY		2018.12.9
APPROVED BY		2018.12.9

CUSTOMER	INITIAL	DATE
APPROVED BY		



REVISION STATUS

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V1.0	2018.12.9	-	First Issued.	



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1. General Description

* DESCRIPTION

PV10108TD31F-C 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 10.1" 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 4Lanes

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	135.36(H) *216.58(V) (10.1inch)	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	0.1692(H) *0.1692(V)	mm	-
Viewing angle	ALL	o'clock	-
Drive IC	OTM1287A	-	-
Display mode	Normally BLACK	-	-
Operating temperature	0~+50	°C	-
Storage temperature	-10~+60	°C	-

Mechanical Information

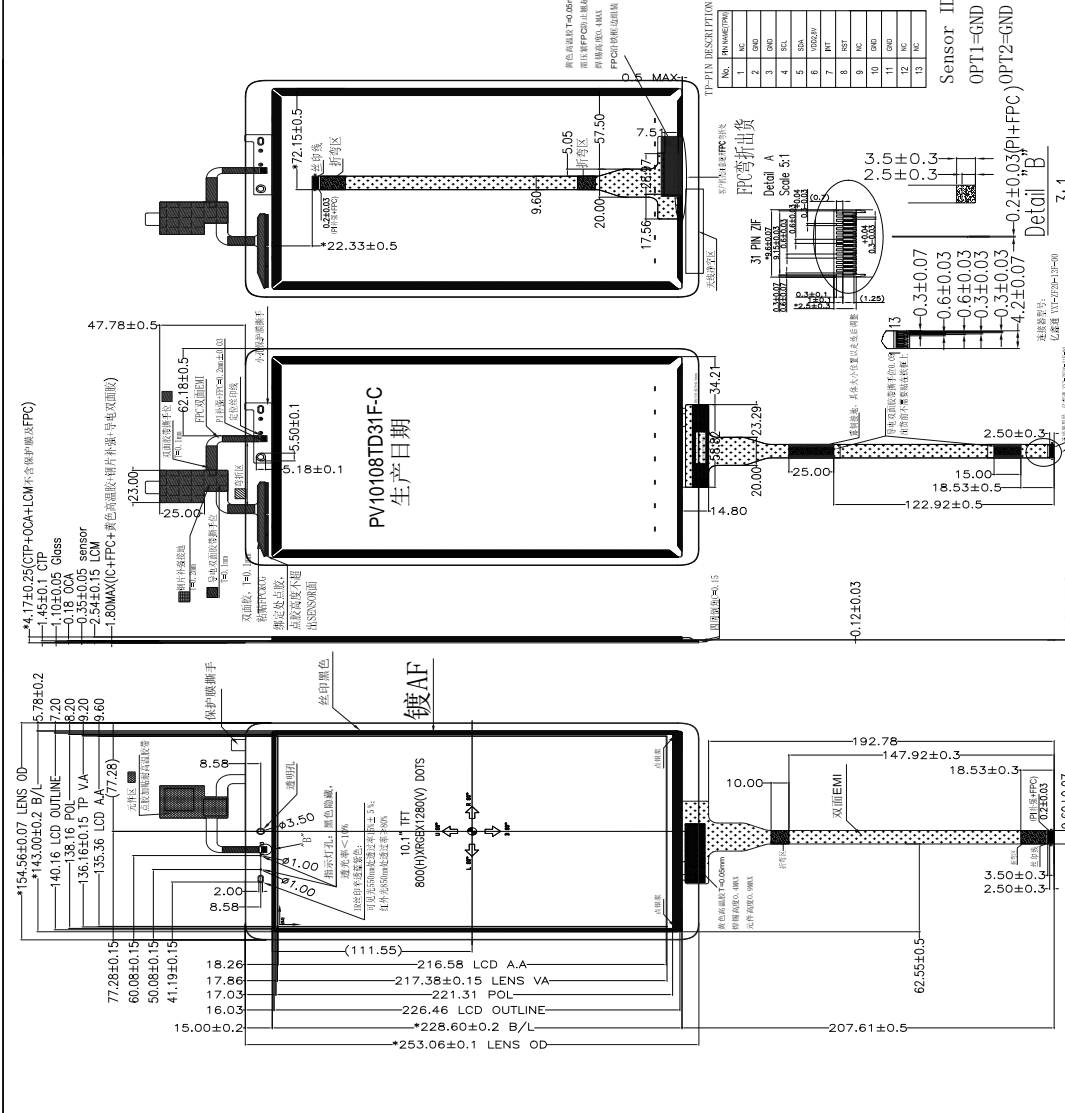
Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	143.00	-	mm	-
	Vertical(V)	-	228.60	-	mm	-
	Depth(D)	-	2.54	-	mm	-
Weight		-	TBD	-	g	-



2. Mechanical Specification



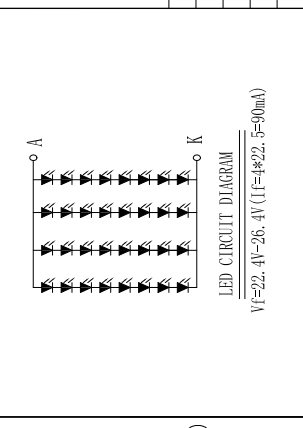
LCM+CTP



LCM产品特点 (LCM Features):

显示类型 (Display mode):	TFT/Normal BLACK
驱动芯片 (Driver IC):	OTM1287A
入屏显示方向 (Viewing Direction):	ALL
接口类型 (Interface Types):	MIPI VIDEO MODE
背光类型 (Backlight Types):	32pins, 8Pin+190mA(22.5mA/LED), 电压为22.4V~27.2V
LCM+CTP亮度 (LCD Brightness):	300 cd/m ² Min, 330 cd/m ² TYP
模组颜色坐标 (Color Coordinate):	(X=0.315±0.03, Y=0.38±0.03)
模组均匀度 (LCD Uniformity):	80% MIN
操作温度 (Operating Temperature):	-10 °C ~ 50 °C
储存温度 (Storage Temperature):	-10 °C ~ 60 °C
平面翘曲度 (Plane Waring Degree):	≤0.4MM
连接器 (IPC CONTROL):	XYT-ZF20-31F-00

- 二. CTP技术要求 (CTP Technical requirements)**
- 技术要求:
1. 结构类型: GFF, 透光率: 85%以上;
 2. IC: G46571
 3. CO材料: 熊胆铝硅T=1mm, 表面硬度: 7H以上 (750gf), 钢化深度≥35um; 应力强度≥700MPa; 落球条件: 10g钢球 30cm跌落五点, 每点两次不裂(0.3I); 表面处理: AF Coating; 初始水磨角≥110°, 摩擦后水磨角≥100°; 摩擦条件: 在美国SANDOR/D5215橡胶摩擦条和美国0000#玻璃丝绒上各施加1000g 压力, 摩擦距离20mm, 摩擦速度50次/分钟, 在触摸屏中央摩擦2000次
 4. 翘曲度小于0.3;
 5. 黑色印刷无砂油, 无透光;
 6. ITO边缘无明显残留胶水;
 7. PFC采用无胶点刷偏, 无明显翘曲, 变形; 补强板边缘无毛刺;
 8. 工作温度范围:-20°~+60°, 10% 300RH; 存储温度范围: 22°C±3°C, 40% 65RH;
 9. ESD要求: 接触±8k, 空气±10k;
 10. 未注公差按 ±0.20mm管控; 未注角度按 0.15±0.10mm管控



Kingetch Group Co., Ltd.

LCM+CTP

标题 (Title):	LCM+CTP
视角 (View):	比例(Proportional) 1:1
单位 (Unit):	1/1
物料编码 (Material Code):	PV10108TD31F-C
日期 (Date):	18/09/26
版本号 (Version):	符号(Symbol)

设计 (DESIGN)	审核 (AUDITING)	批准 (APPROVED)
1/1	1/1	
6	5	7



3. PIN DESCRIPTION

LCM

Pin NO.	Symbol	Function
1	GND	Ground
2	LED-	Backlight-
3	LED+	Backlight+
4	GND	Ground
5	NC	Not Connect
6	VBAT	//Not Connect
7	GND	Ground
8	VDD1.8V	Power supply 1.8V
9	GND	Ground
10	D3N	DSI_D3N are differential data signal line
11	D3P	DSI_D3P are differential data signal line
12	GND	Ground
13	D0N	DSI_D0N are differential data signal line
14	D0P	DSI_D0P are differential data signal line
15	GND	Ground
16	CLKN	DSI_CLKN are differential data signal line
17	CLKP	DSI_CLKP are differential data signal line
18	GND	Ground
19	D1N	DSI_D1N are differential data signal line
20	D1P	DSI_D1P are differential data signal line
21	GND	Ground
22	D2N	DSI_D2N are differential data signal line
23	D2P	DSI_D2P are differential data signal line
24	GND	Ground
25	RESET	Hardware reset pin
26	TE	Tearing effect output
27	VDD2.8V	Power supply 2.8V
28	GND	Ground
29	LCD-ID	Connct 100K resistance to GND
30	NC	Not Connect
31	GND	Ground



CTP

1	NC	Not Connect
2-3	GND	Ground
4	SCL	Serial clock input
5	SDA	Serial data input pin
6	VDD2.8	Power supply 2.8V
7	INT	Interrupt pin
8	REST	Hardware reset pin
9	NC	Not Connect
10-11	GND	Ground
12-13	NC	Not Connect



4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min	Max.		
Supply Voltage for Logic circuit	VDD	3.0	3.6	V	VDD=150mA
Supply Voltage for analog circuit	IOVDD	1.65	3.3	V	IOVDD=30mA

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	3	3.3	3.6	V	
Analog Supply Voltage	AVDD	9.4	9.6	10	V	
Common Voltage	VCOM	3.2	3.4	3.6	V	
TFT Gate ON Voltage	VGH	-	15	-	V	
TFT Gate OFF Voltage	VGL	-	-13	-	V	

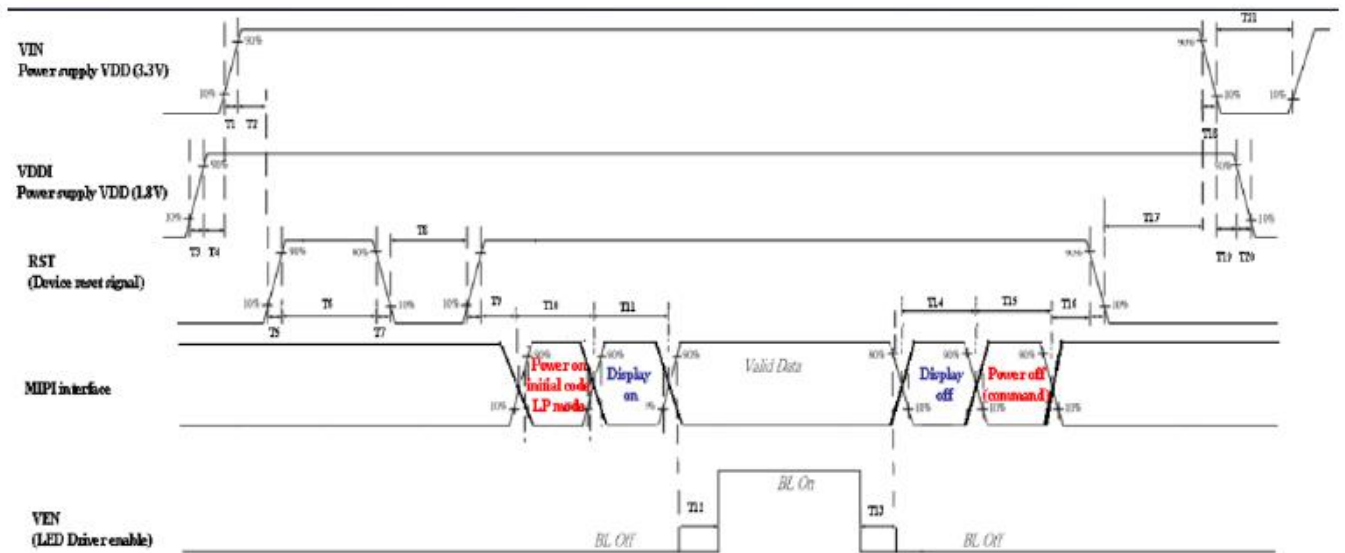
4.2.2 BACKLIGHT UNIT (GND=0V)



Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Forward supply Voltage	V _f	22.4	25.6	27.2	V	
Forward supply Current	I _f	-	90	-	mA	
LCM Luminance	L _v	300	330	-	cd/m ²	I _B =90mA
Uniformity	/	80			%	-

4.3 TIMING CHARACTERISTICS

3.6 power on/off sequence





Power Sequence Timing			
Parameter	Value		Units
	Min.	Max.	
T1	0.5	10	ms
T2	1	-	
T3	0.5	10	
T4	0	50	
T5	0	0.002	
T6	5	-	
T7	0	0.002	
T8	0.1	-	
T9	10	-	
T10	180	-	
T11	60	-	
T12	200	-	
T13	200	-	
T14	33.4	-	
T15	180	-	
T16	50	-	
T17	120	-	
T18	0	10	
T19	0	10	
T20	0	10	
T21	500	-	



3.8 Timing

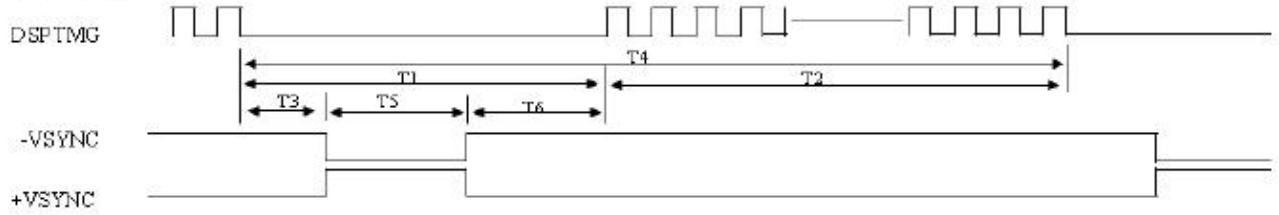
Vertical Total	VT (tv)	1300	line
Vertical Front-Porch	VFP (t _{fp})	8	line
Vertical Active	VA (t _{vd})	1280	line
Vertical Sync.	VS (t _w)	4	line
Vertical Back-Porch	VBP (t _{vp})	8	line
Horizontal Total	HT (th)	960	clk(pixel)
Horizontal Front-Porch	HFP (t _{hfp})	24	clk(pixel)
Horizontal Active	HA (t _{hd})	800	clk(pixel)
Horizontal Sync.	HS (t _{hw})	4	clk(pixel)
Horizontal Back-Porch	HBP (t _{hbp})	132	clk(pixel)
Pixel Frequency	CLK (fc)	75.00	MHz



Driving

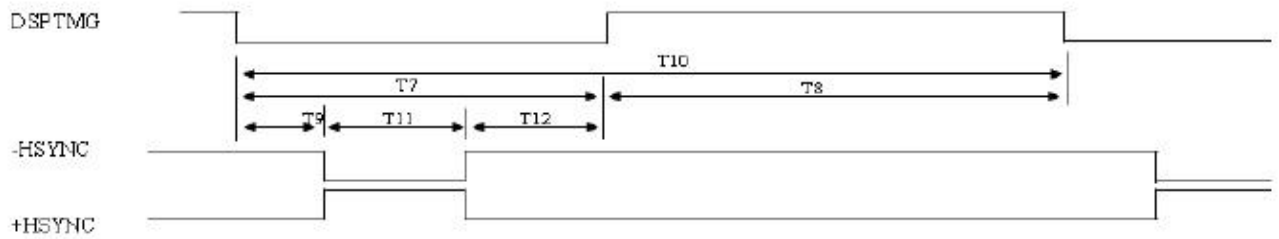
(LVDS Receiver Output)

Vertical Timing



Item	T1 Vertical Blanking	T2 Active Field	T3 VSYNC Front Porch	T4 Frame Time	T5 VSYNC Width	T6 VSYNC Back Porch
Value	20	1280	8	1300	4	8

Horizontal Timing



Item	T7 Horizontal Blanking	T8 Active Field	T9 HSYNC Front Porch	T10 H Line Time	T11 HSYNC Width	T12 HSYNC Back Porch
Value	160	800	24	960	4	132

Dot Timing

Item	Dot Clock Frequency	Data Clock Frequency
Value	75MHz	Dot Clock Frequency

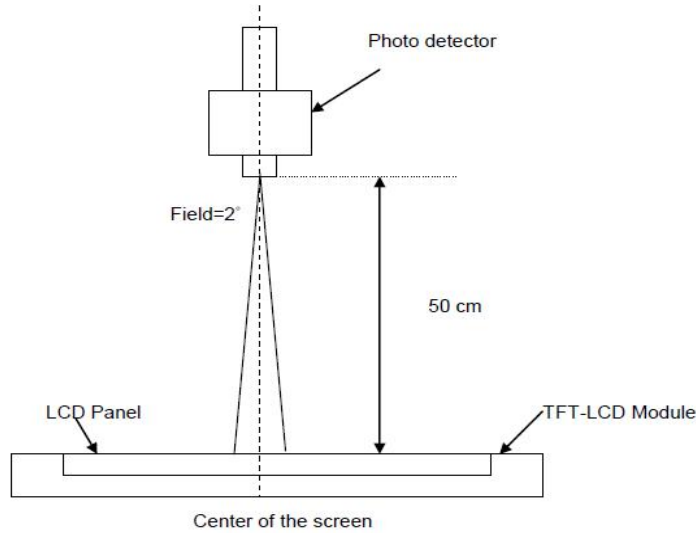


5.OPTICAL CHARACTERISTICS

5. The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note.0.

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Viewing Angle	θ_R θ_L	Horizontal (Right) CR = 10 (Left)	80	85	-	degree	1, 6
			80	85	-		
	ψ_H ψ_L	Vertical (Upper) CR = 10 (Lower)	80	85	-		
			80	85	-		
Contrast Ratio	CR		800	1000	-		1, 3
Cross talk	%		---	---	4		1, 4
Response Time	T_{RT}	Rising + Falling	-	30	35	msec	5
Color / Chromaticity Coodinates	Red	Rx	CIE 1931	0.580	0.610	0.640	@Silicate LED BL 模 擬值
		Ry		0.318	0.348	0.378	
	Green	Gx		0.310	0.340	0.370	
		Gy		0.569	0.599	0.629	
	Blue	Bx		0.122	0.152	0.182	
		By		0.055	0.085	0.115	
	White	Wx		0.270	0.300	0.330	
		Wy		0.290	0.320	0.350	
NTSC	%	-	-	58	-		
Transmittance	%		5.1	5.8	NA		

Note.1: Definition of Viewing Angle: Refer to figure as below:



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

Measure the luminance of gray level 63 at 5 points , $Y_L = [L (1)+ L (2)+ L (3)+ L (4)+ L (5)] / 5$
 $L (x)$ is corresponding to the luminance of the point X at Figure in Note (1).

Note 3 : Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

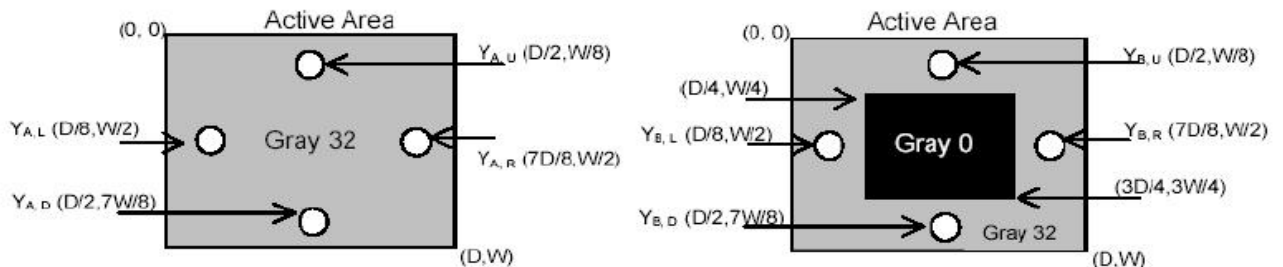
Note 4 : Definition of Cross Talk (CT)

$$CT = |Y_B - Y_A| / Y_A \times 100 (\%)$$

Where

Y_A = Luminance of measured location without gray level 0 pattern (cd/m²)

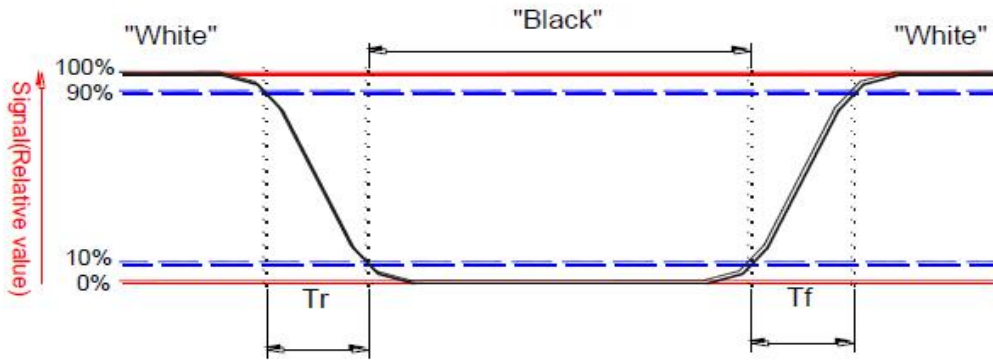
Y_B = Luminance of measured location with gray level 0 pattern (cd/m²)





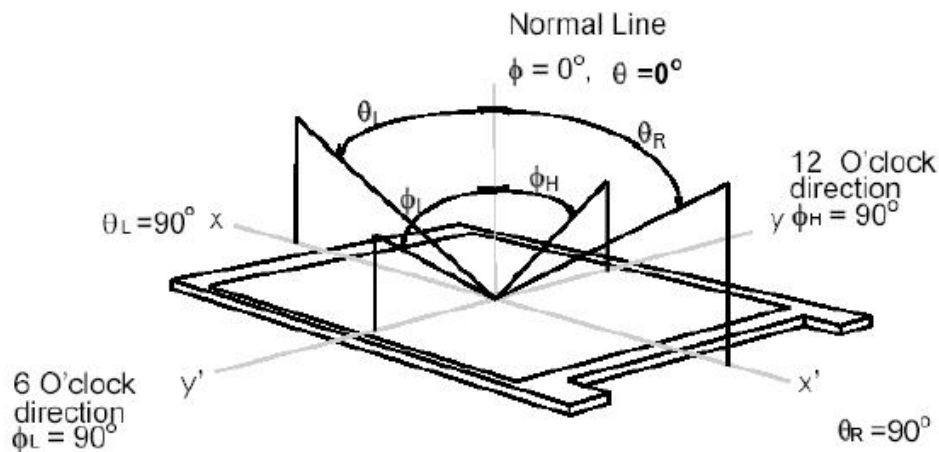
Note 5: Definition of response time:

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below.



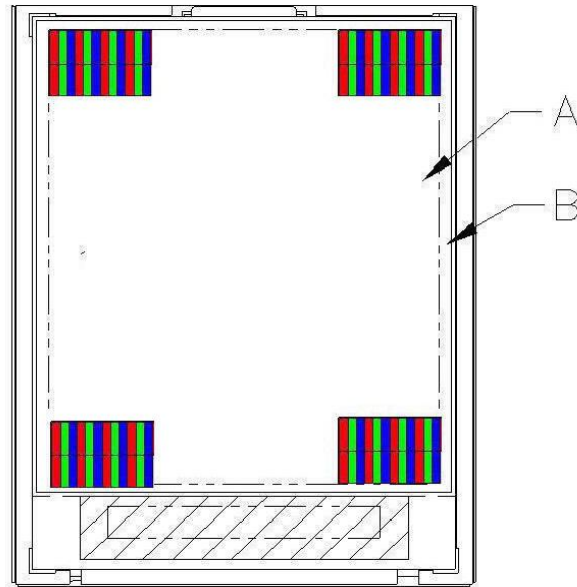
Note 6. Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (ϕ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.





6.2 DEFINITION OF AREA





A Area : Viewing area.

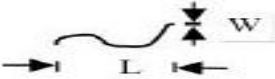
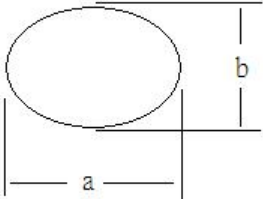
B Area : Out of viewing. (outside viewing area)



6.3 INSPECTION SPECIFICATION

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



NO	Item	Acceptable specification	Judgment Criterion																																												
3	Cosmetic Inspection	<p>3-1 Blemish: Line shapes of defect</p> <table border="1" data-bbox="363 394 1313 748"> <thead> <tr> <th>Length</th> <th>Width</th> <th>Acceptable number</th> <th>Mini. space</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.08$</td> <td>Ignore</td> <td rowspan="3">10MM</td> </tr> <tr> <td>$L \leq 10MM$</td> <td>$0.08 < W \leq 0.10$</td> <td>3</td> </tr> <tr> <td>$L \leq 10MM$</td> <td>$0.10 < W \leq 0.20$</td> <td>1</td> </tr> <tr> <td>--</td> <td>$W > 0.20$</td> <td>Not allowed</td> <td>---</td> </tr> </tbody> </table> <p>L: length(mm) W: width(mm)</p>  <p>3-2 Blemish: dot shapes of defect.</p> <table border="1" data-bbox="435 1005 1281 1238"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Mini. Space</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Ignore</td> <td>---</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.25$</td> <td>4</td> <td rowspan="2">5 m m</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.35$</td> <td>3</td> </tr> <tr> <td>$\Phi > 0.35$</td> <td>0</td> <td>---</td> </tr> </tbody> </table> <p>3-3 Polarizer Bubble</p> <table border="1" data-bbox="435 1312 1281 1476"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Mini. Space</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.30$</td> <td>Ignore</td> <td>---</td> </tr> <tr> <td>$0.30 < \Phi \leq 0.40$</td> <td>4</td> <td>15 m m</td> </tr> <tr> <td>$\Phi > 0.40$</td> <td>0</td> <td>---</td> </tr> </tbody> </table> <p>Foreign Substances</p>  <p>$\Phi = (a+b)/2$</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	---	Dimension	Acceptable number	Mini. Space	$\Phi \leq 0.20$	Ignore	---	$0.20 < \Phi \leq 0.25$	4	5 m m	$0.25 < \Phi \leq 0.35$	3	$\Phi > 0.35$	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	---	
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NO	Item	Acceptable specification	Judgment Criterion			
3	Cosmetic Inspection	3-4 Scratch ● Sensate scratch not allowed. ● Impassive scratch as below.				
		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 invisible.				



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	-10°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