Add: 2nd Floor, Building C, Jia Huang Yuan Technical Park, Tiegang, Xixiang, Bao'an District, Shenzhen city, Guangdong province, P.R.China 518126.
E-mail: Helen@kingtechgroup.cn TEL: 86-755- 23037763 Mobile: +86-139-2528-0716 Web: www.kingtechgroup.cn

SPECIFICATION FOR LCD Module

MODULE:	PV0503TD25D-C
CUSTOMER:	

Add: 2nd Floor, Building C, Jia Huang Yuan Technical Park, Tiegang, Xixiang, Bao'an District, Shenzhen city, Guangdong province, P.R.China 518126.
E-mail: Helen@kingtechgroup.cn TEL: 86-755- 23037763 Mobile: +86-139-2528-0716 Web: www.kingtechgroup.cn

REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2017-1-11	-	First Issued.	
V1.1	20180808	5	Update Mechanical Specification	YANG

TABLE OF CONTENTS

1. General Description

* DESCRIPTION

PV0503TD25D-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 5.0" TFT-LCD contains 720 x 1280 pixels, and can display up to 16.7M colors.

* Features

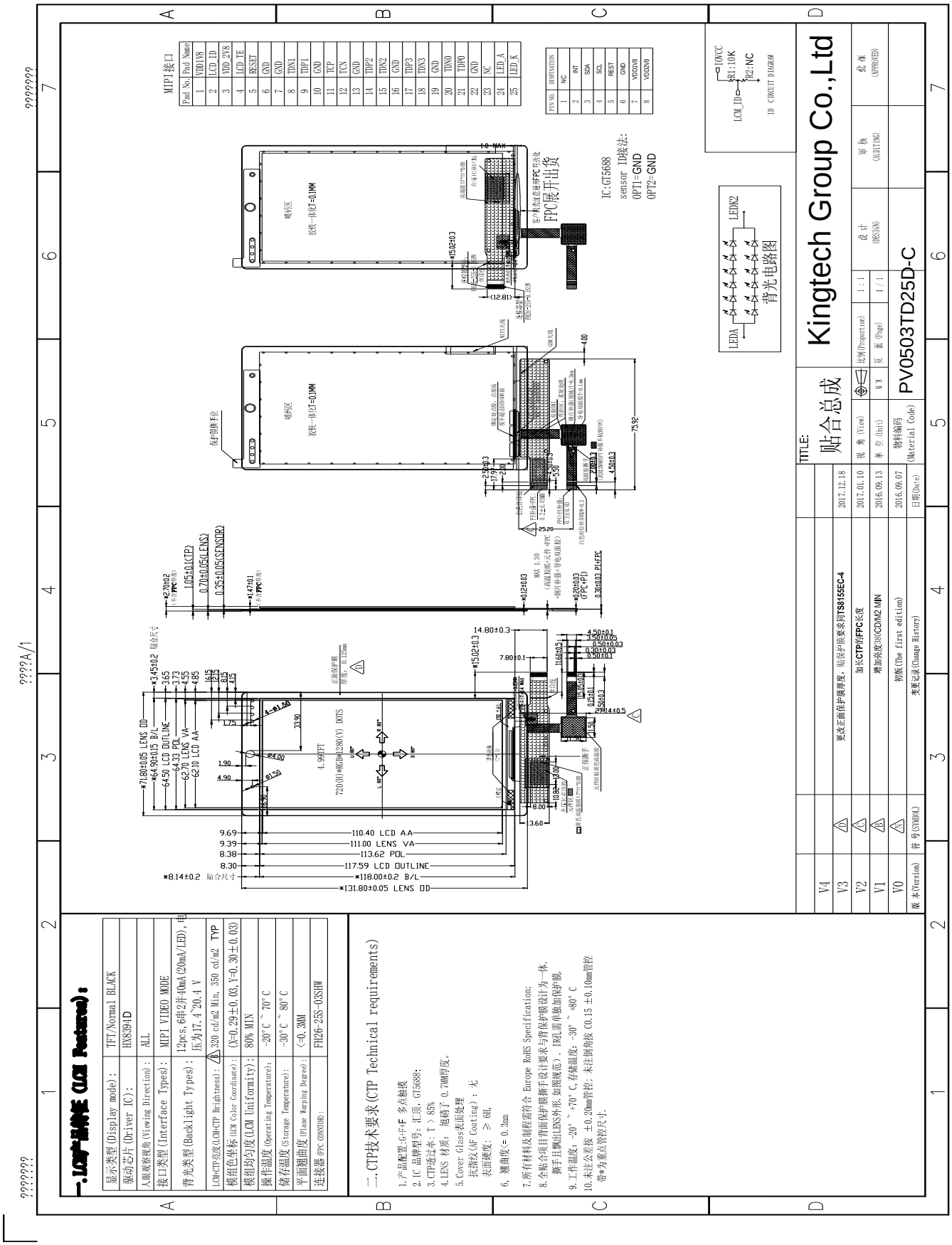
-Low Input Voltage: IOVCC: 1.65~3.3V;VCC: 2.5~3.3V
-Display Colors of TFT LCD: 16.7M colors
- Interface: MIPI-4 Lanes
-Internal Power Supply Circuit.

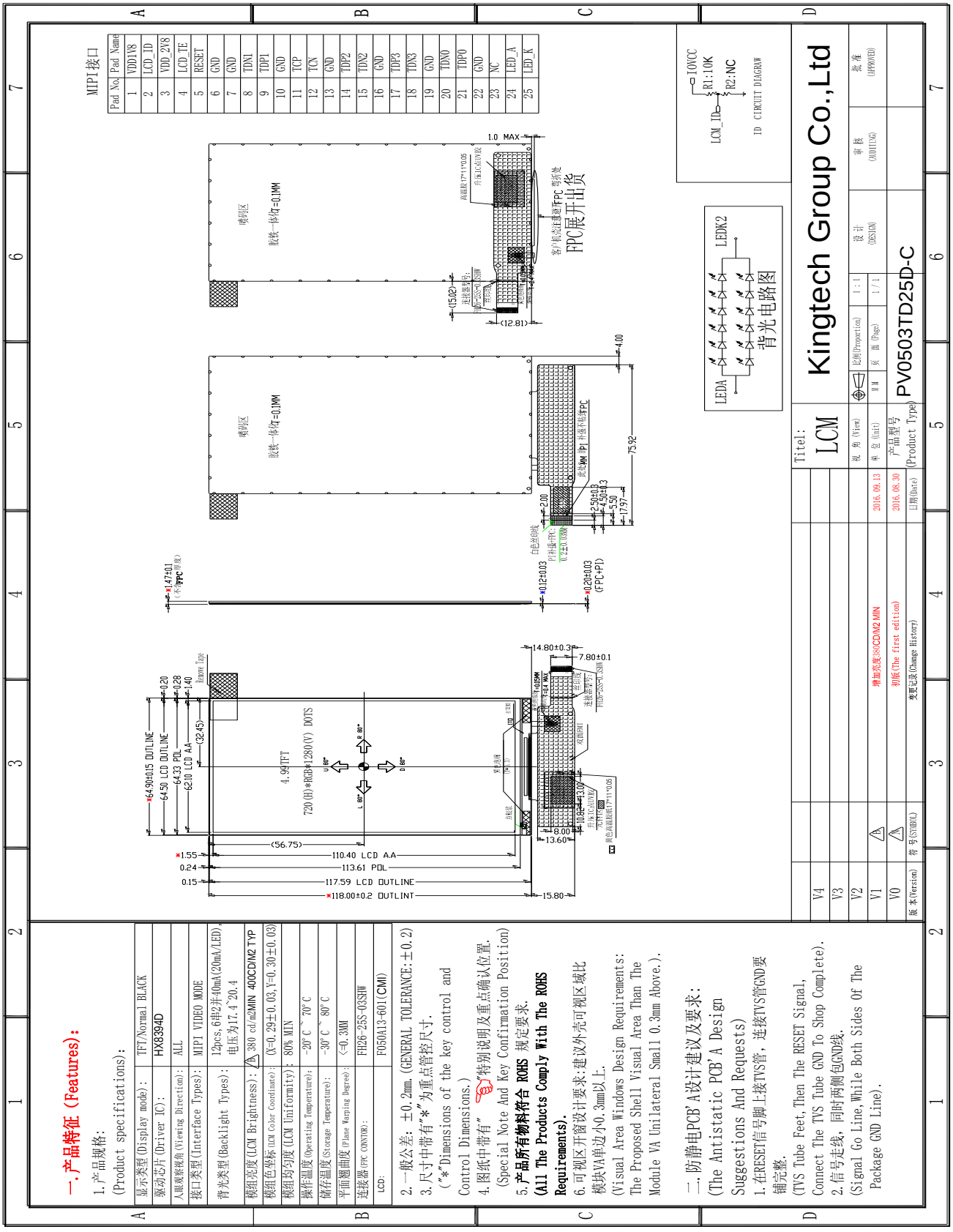
General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	62.1(H) *110.4 (V)	mm	-
Driver element	a-Si TFT active matrix	-	-
Display colors	16.7M	colors	-
Number of pixels	720(RGB) *1280	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.02875 (H) *0.08625 (V)	mm	-
Viewing angle	All	o'clock	-
Drive IC	HX8394D	-	-
Display mode	Normally black	-	-
Operating temperature	-20～+70	℃	-
Storage temperature	-30～+80	℃	-

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	71.8	-	mm	±0.05
	Vertical(V)	-	131.8	-	mm	±0.05
	Depth(D)	-	2.70		mm	±0.2
Weight		-	TBD	-	g	-

2. MECHANICAL SPECIFICATION




MIPI接口
Pad No. Pad Name
1 VDD1V8
2 LCD_ID
3 VDD_2V8
4 LCD_TE
5 RESET
6 GND
7 GND
8 TDN1
9 TDP1
10 GND
11 TCP
12 TCN
13 GND
14 TDP2
15 TDN2
16 GND
17 TDP3
18 TDN3
19 GND
20 TDN0
21 TDP0
22 GND
23 NC
24 LED_A
25 LED_K
IOVCC
R1:10K
R2:NC
LCM_ID
ID CIRCUIT DIAGRAM
LEDA
LEDK2
背光电路图
喷印区
胶铁一体切=0.1MM
客户机壳装配FPC弯折处
FPC展开出货
1.0 MAX
4.00
75.92
2.00
17.97
4.530
4.50±0.03
2.50±0.03
0.20±0.03
(FPC+PI)
1.47±0.1
64.90±0.15 OUTLINE
64.50 LCD OUTLINE
64.33 PDL
62.10 LCD AA
(32.45)
0.20
0.28
1.40
Bezel Size
4.99TFT
720 (H)*RGB*1280 (V) DOTS
14.80±0.3
7.80±0.1
8.00
13.60
10.00±0.3
(56.75)
110.40 LCD AA
113.61 PDL
117.59 LCD OUTLINE
118.00±0.2 OUTLINT
15.80
1.55
0.24
0.15
一.产品特征 (Features):
1.产品规格:
(Product specifications):
显示类型(Display mode): TFT/Normal BLACK
驱动芯片(Driver IC): HX8394D
人眼观察视角(Viewing Direction): ALL
接口类型(Interface Types): MIPI VIDEO MODE
背光类型(Backlight Types): 12pcs, 6串2并40mA(20mA/LED), 电压为17.4~20.4
模组亮度(LCM Brightness): 380 cd/m2MIN 400CD/M2 TYP
模组色坐标(LCM Color Coordinate): (X=0.29±0.03,Y=0.30±0.03)
模组均匀度(LCM Uniformity): 80% MIN
操作温度(Operating Temperature): -20° C ~ 70° C
储存温度(Storage Temperature): -30° C ~ 80° C
平面翘曲度(Plane Warping Degree): <=0.3MM
连接器(FPC CONTOR): FH26-25S-03SHW
LCD: F050A113-601(CMI)
2.一般公差: ±0.2mm.(GENERAL TOLERANCE:±0.2)
3.尺寸中带有"*"为重点管控尺寸.
("*"Dimensions of the key control and Control Dimensions.)
4.图纸中带有" "特别说明及重点确认位置.
(Special Note And Key Confirmation Position)
5.产品所有物料符合 ROHS 规定要求.
(All The Products Comply With The ROHS Requirements).
6.可视区开窗设计要求:建议外壳可视区域比模块VA单边小0.3mm以上.
(Visual Area Windows Design Requirements: The Proposed Shell Visual Area Than The Module VA Unilateral Small 0.3mm Above.).
二.防静电PCB'A设计建议及要求:
(The Antistatic PCB'A Design Suggestions And Requests)
1.在RESET信号脚上接TVS管,连接TVS管GND要铺完整.
(TVS Tube Feet, Then The RESET Signal, Connect The TVS Tube GND To Shop Complete).
2.信号走线,同时两侧包GND线.
(Signal Go Line, While Both Sides Of The Package GND Line).
Titel: LCM
Kingtech Group Co.,Ltd
视 角 (View)
单 位 (Unit)
比例(Proportion) 1 : 1
页 面 (Page) 1 / 1
设 计 (DESIGN)
审 核 (AUDITING)
批 准 (APPROVED)
产品型号 (Product Type) PV0503TD25D-C
版 本 (Version)
符 号(SYMBOL)
日期(Date)
变更记录 (Change History)
V4
V3
V2
V1 2016.09.13 初版(The first edition)
V0 2016.08.30 增加亮度350CD/M2 MIN

3. PIN DESCRIPTION

Pin NO.	Symbol	Level	Remark
1	VDD1V8	H	A supply voltage to the digital circuit. (1.8-3.3V)
2	LCD_ID	H/L	LCD identification
3	VDD2V8	H	A supply voltage to the digital circuit. (2.8-3.3V)
4	LCD_TE	H/L	Output pin for scan line signal
5	RESET	H/L	Reset signal.
6	GND	L	Power Ground
7	GND	L	Power Ground
8	TDN1	H/L	MIPI_D1- are differential data signal line
9	TDP1	H/L	MIPI_D1+ are differential data signal line
10	GND	L	Power Ground
11	TCP	H/L	CLOCK Lane positive-end input pin
12	TCN	H/L	CLOCK Lane engative-end input pin
13	GND	L	Power Ground
14	TDP2	H/L	MIPI_D2+ are differential data signal line
15	TDN2	H/L	MIPI_D2- are differential data signal line
16	GND	L	Power Ground
17	TDP3	H/L	MIPI_D3+ are differential data signal line
18	TDN3	H/L	MIPI_D3- are differential data signal line
19	GND	L	Power Ground
20	TDN0	H/L	MIPI_D0- are differential data signal line
21	TDP0	H/L	MIPI_D0+ are differential data signal line
22	GND	L	Power Ground
23	NC		Not connect
24	LED-A	H	LED backlight+
25	LED-K	L	LED backlight-

4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min	Max.		
Supply Voltage for Logic circuit	VDDIO	-0.3	3.6	V	
Supply Voltage for analog circuit	Vcc	-0.3	3.6	V	

4.2 DC ELECTRICAL CHARACTERISTICS

4.2.1 OPERATING CONDITIONS

Typical Operating Conditions (Ta=25℃)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Power Supply	Vcc	2.5	2.8	3.3	V	
Power Supply	VDDIO	1.65	1.8	3.3	V	
Normal mode Current consumption	Icc	-	48	-	mA	VCC=2.8V
TFT Gate ON Voltage	V_{GH}	10	15	-	V	
TFT Gate OFF Voltage	V_{GL}		-9	-13	V	

4.2.2 BACKLIGHT UNIT (GND=0V)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Forward supply Voltage	V_f	17.4	19.2	20.4	V	
Forward supply Current	I_f	-	40	-	mA	
LCM Luminance	L_V	320	350	-	cd/m2	I_B=40mA
Uniformity	/	80			%	-

4.3 MIPI Interface Characteristics

43.1

High Speed Mode

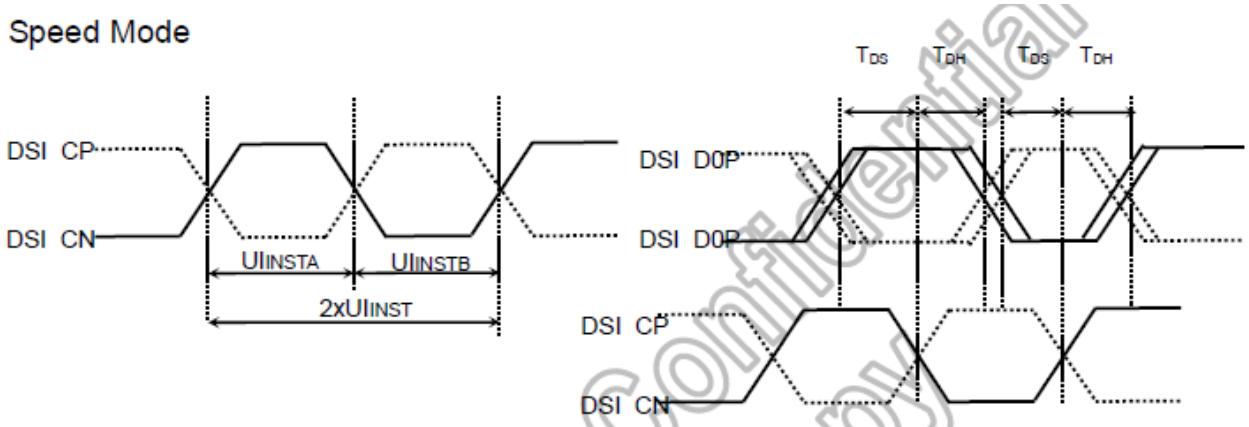


Figure 7.4: DSI clock timing Characteristics

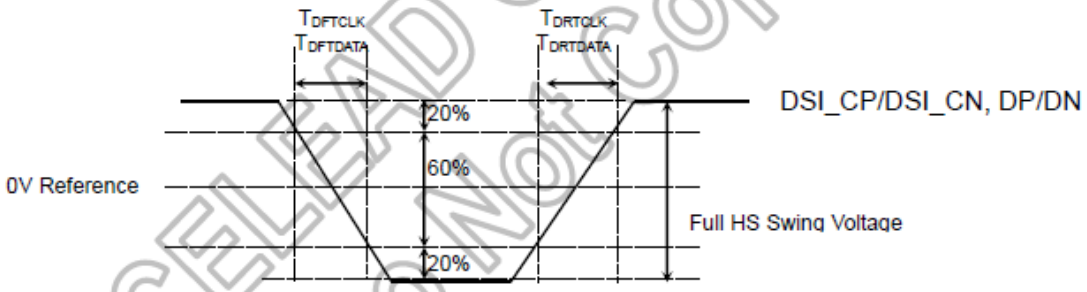


Figure 7.5: Rising and falling time on clock and data channel

(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, T_A = -30 to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_CP/ DSI_CN	Double UI instantaneous	2xUINST	TBD	-	25	ns
	UI instantaneous	UINSTA UINSTB	TBD	-	12.5	ns
DP/DN	Data to clock setup time	TDS	0.15xUI	-	-	ps
	Data to clock hold time	TDH	0.15xUI	-	-	ps
DSI_CP/ DSI_CN	Differential rise time for clock	TDRTCLK	150	-	0.3UI	ps
	Differential fall time for clock	TDFTCLK	150	-	0.3UI	ps
DP/DN	Differential rise time for data	TDRTDATA	150	-	0.3UI	ps
	Differential fall time for data	TDFTDATA	150	-	0.3UI	ps

DSI High SpeedMode Characteristics

4.32

Low Power Mode

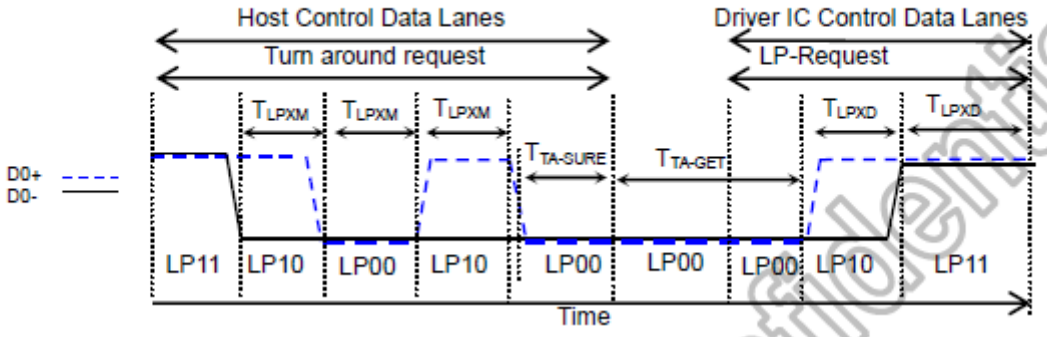
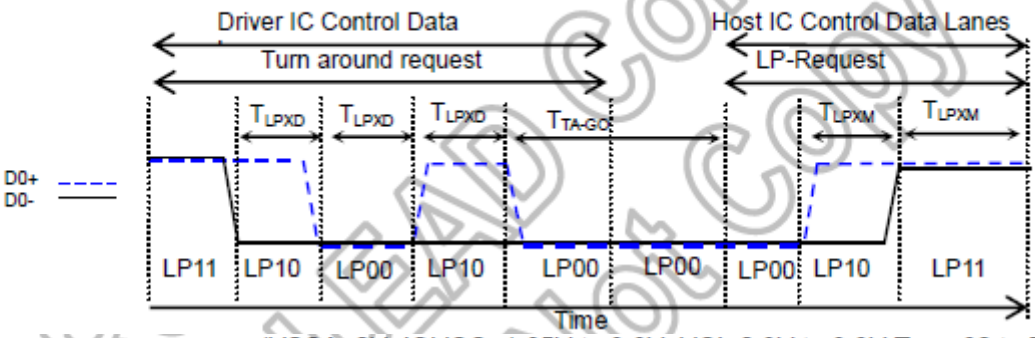


Figure 7.6: BTA from HOST to Display Module Timing



(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.3V to 3.3V, T_A = -30 to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_D0P/ DSI_D0P	Length of LP-00/LP01/LP10/LP11 Host→ Display module	T_{LPXM}	50	-	-	ns
	Length of LP-00/LP01/LP10/LP11 Display module →Host	T_{LPXD}	50	-	-	ns
	Time-out before the MPU start driver	$T_{TA-SURE}$	T_{LPXD}	-	2xT_{LPXD}	ns
	Time to drive LP-00 by display module	T_{TA-GET}	5xT_{LPXD}	-	-	ns
	Time to drive LP-00 after turnaround request Host	T_{TAGO}	4xT_{LPXD}	-	-	ns

DSI Low PowerMode Characteristics

5. OPTICAL CHARACTERISTICS

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance (w/o DBEF)		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$		3.3	--	%	All left side data are based on INX's following condition – 1.LC : AAS . 2.CF : CG 70% CF. 3.Light Source : INX LED BLU. 4.Polarizer : CF SRW062APN1-HC5 / TFT SRW062APN1. 5.Machine : DMS 803, (ConoScope for View Angle). 6. VLC dark ≦ 0.2 V, VLC white ≧ 5 V
Contrast Ratio		CR		600	1000	--	--	
Response Time		$T_{on} + T_{off}$		-	25	35	ms	
Viewing Angle	Hor.	θ_{X+}	Center CR>10	--	80	--	deg.	
		θ_{X-}		--	80	--		
	Ver.	θ_{Y+}		--	80	--		
		θ_{Y-}		--	80	--		
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$	0.641	0.661	0.681	-	Under C light (CIE 1931)
		Ry		0.306	0.326	0.346	-	
	Green	Gx		0.257	0.277	0.297	-	
		Gy		0.550	0.570	0.590	-	
	Blue	Bx		0.125	0.145	0.165	-	
		By		0.057	0.077	0.097	-	
	White	Wx		0.290	0.310	0.330	-	
		Wy		0.314	0.334	0.354	-	
Color Gamut	CG			--	70%	--	%	

*Note(1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

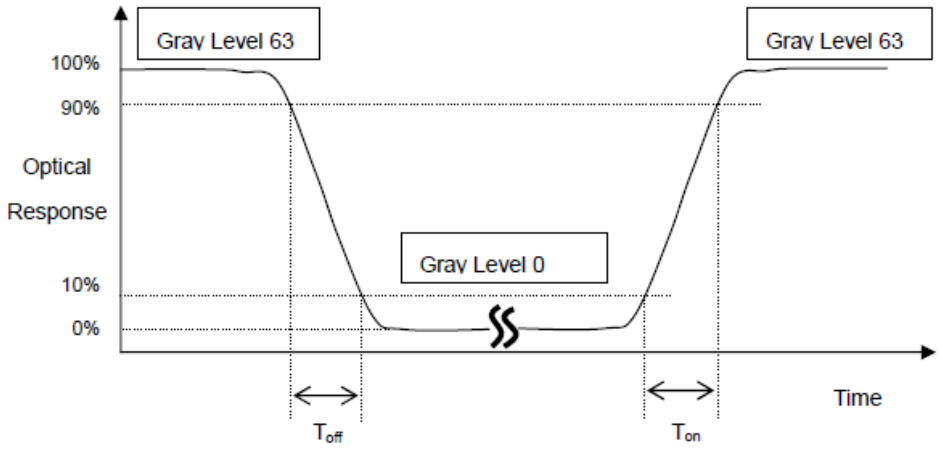
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

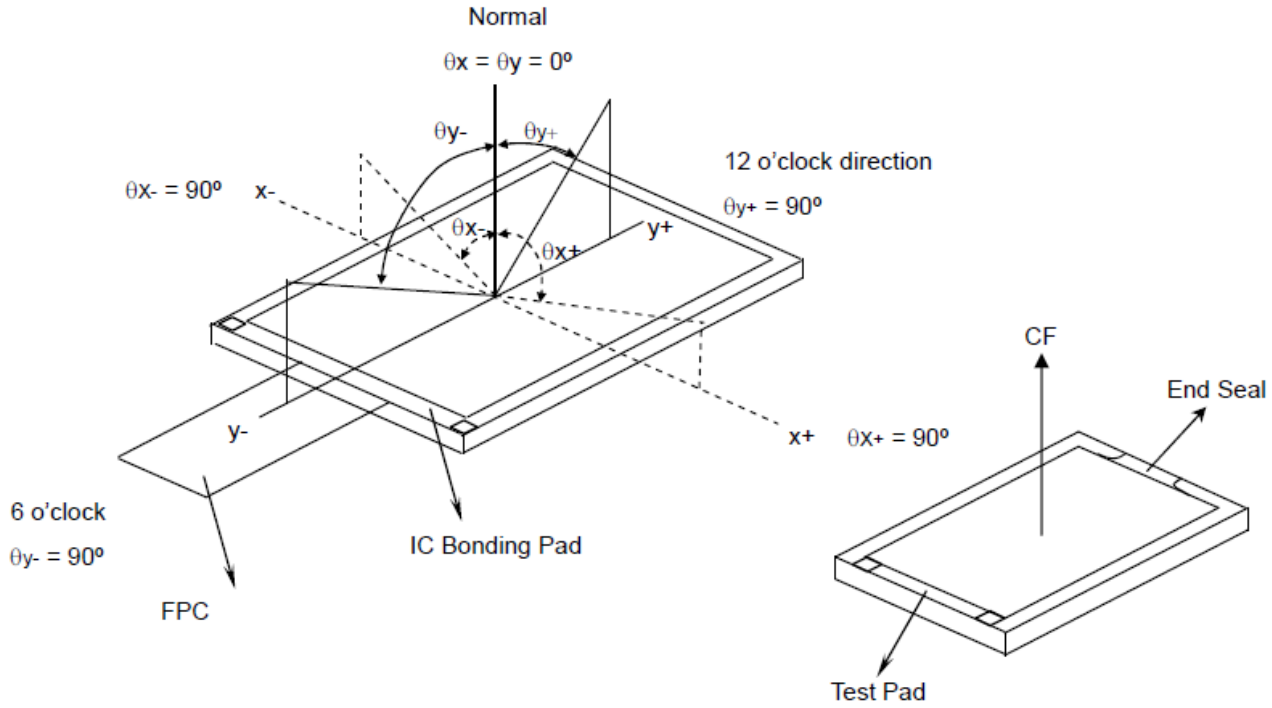
CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_{on}, T_{off}):

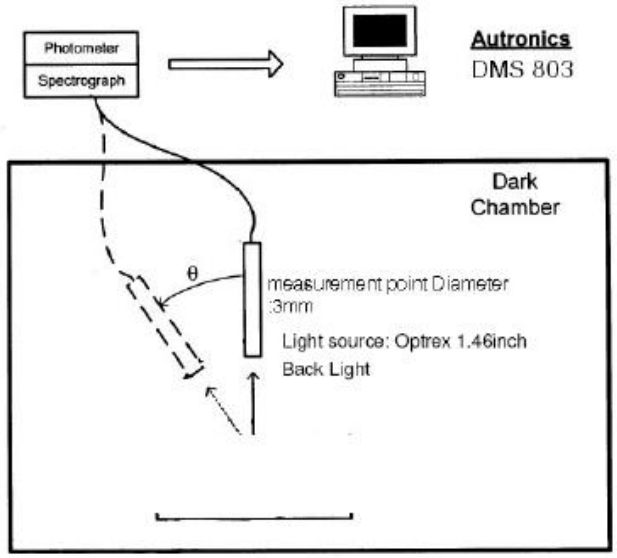


*Note(3) Definition of Viewing Angle

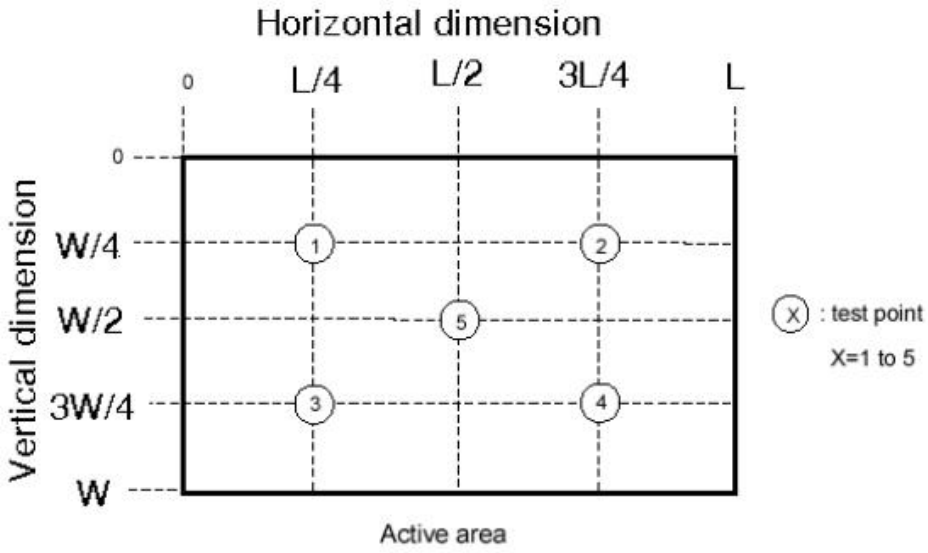


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature chan during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight f 20 minutes in a windless room.



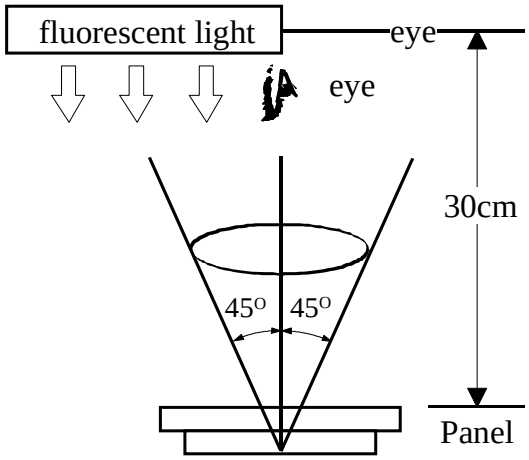
*Note (5)



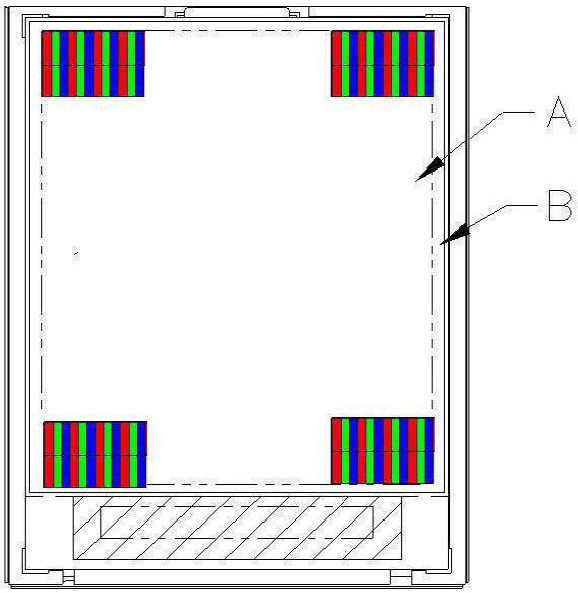
6. QUALITY SPECIFICATIONS

6.1 INSPECTION CONDITION

(1) Inspect under 300~500Lux fluorescent light, leaving 30~35cm between panels and eyes, and between panels and lights.
(2) Inspection condition is 23±5°C, 50±20%RH maximum.

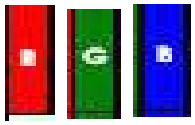
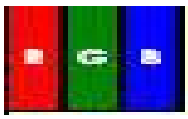


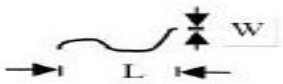
6.2 DEFINITION OF AREA

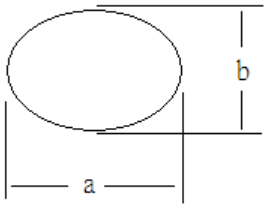


A Area : Viewing area.
B Area : Out of viewing.(outside viewing area)

6.3 INSPECTION SPECIFICATION

NO	Item	Acceptable specification	Judgment Criterion
1	Electrical Testing	**1-1 sub pixel classification** ● Sub Pixel: Number of sub pixel doesn't exceed one dot.  **Sub Pixel (Dot)** **a> Dark dot ----one Allowed** **b> Bright dot ---- one Allowed**	N≦1
		● Pixel : Three dots link together doesn't exceed ones  **Pixel**	N≦0
		1-2 Leakage to light ● Leakage to light be not allowed.	N=0
		1-3 Picture to shake ● Picture had shake, twinkle and noise etc. instable of defect that be not allowed.	N=0
		1-4 Function ● No display or No function. ● Source Line, Gate Line. ● Contrast Ratio ● Current consumption exceeds product specifications. ● Display malfunction.	N=0
2	Mechanical Dimension	2-1 Mechanical Dimension exceeds product specifications. 2-2 Out of frame and boss of plastic changed shape that be not allowed.	N=0

<table>
<tr><th>NO</th><th>Item</th><th>Acceptable specification</th><th>Judgment Criterion</th></tr>
<tr><td>3</td><td>Cosmetic Inspection</td><td>
3-1 Blemish: Line shapes of defect
<table>
<tr><th>Length</th><th>Width</th><th>Acceptable number</th><th>Mini. space</th></tr>
<tr><td>---</td><td>W≦0.03</td><td>Ignore</td><td rowspan="3">5 m m</td></tr>
<tr><td>L≦2.5</td><td>0.03<W≦0.05</td><td>3</td></tr>
<tr><td>L≦2.5</td><td>0.05<W≦0.1</td><td>2</td></tr>
<tr><td>--</td><td>W＞0.1</td><td>Not allowed</td><td>---</td></tr>
</table>
L: length(mm)
W: width(mm)


3-2 Blemish: dot shapes of defect.
<table>
<tr><th>Dimension</th><th>Acceptable number</th><th>Mini. Space</th></tr>
<tr><td>Φ≦0.10</td><td>Ignore</td><td>---</td></tr>
<tr><td>0.10＜Φ≦0.15</td><td>2</td><td rowspan="2">5 m m</td></tr>
<tr><td>0.15＜Φ≦0.25</td><td>1</td></tr>
<tr><td>Φ＞0.25</td><td>0</td><td>---</td></tr>
</table>
3-3 Polarizer Bubble
<table>
<tr><th>Dimension</th><th>Acceptable number</th><th>Mini. Space</th></tr>
<tr><td>Φ≦0.20</td><td>Ignore</td><td>---</td></tr>
<tr><td>0.20＜Φ≦0.30</td><td>2</td><td>15 m m</td></tr>
<tr><td>Φ＞0.30</td><td>0</td><td>---</td></tr>
</table>
Foreign Substances


Φ=(a+b)/2
</td><td></td></tr>
</table>

<table>
<tr><th>NO</th><th>Item</th><th>Acceptable specification</th><th>Judgment Criterion</th></tr>
<tr><td>3</td><td>Cosmetic Inspection</td><td>
3-4 Scratch
● Sensate scratch not allowed.
● Impassive scratch as below.
Unit:mm
<table>
<tr><th>Length</th><th>Width</th><th>Acceptable number</th><th>Mini. space</th></tr>
<tr><td>-----</td><td>W≦0.03</td><td>Ignore</td><td rowspan="3">5 m m</td></tr>
<tr><td>L≦2.5</td><td>0.03<W≦0.05</td><td>3</td></tr>
<tr><td>L≦2.5</td><td>0.05<W≦0.1</td><td>2</td></tr>
<tr><td>----</td><td>0.1＜W</td><td>Not allowed</td><td rowspan="2">---</td></tr>
<tr><td>L>2.5</td><td>----</td><td>Not allowed</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Package</td><td>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.</td><td>N=0</td></tr>
</table>

Add: 2nd Floor, Building C, Jia Huang Yuan Technical Park, Tiegang, Xixiang, Bao'an District, Shenzhen city, Guangdong province, P.R.China 518126.
E-mail: Helen@kingtechgroup.cn TEL: 86-755- 23037763 Mobile: +86-139-2528-0716 Web: www.kingtechgroup.cn

7. RELIABILITY

Test Item	Test Condition
High Temperature Operation	70℃ for 72 hours
Low Temperature Operation	-20℃ for 72hours
High Temperature Storage	80℃ for 72 hours
Low Temperature Storage	-30℃ for 72 hours
High Temperature Operation Humidity Operation	80℃, 90%RH for 60 hours
Thermal Shock	-30 ℃storage one hour,rise to 70 °within 15s,high temperature one hour, drop to 30 °within 15s, circulate ten repeatedly
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

8.1 SAFETY

(1) Do not swallow any liquid crystal, even if there is no proof that liquid stal 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±5℃ and thehumidity is below 50±20%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 ketonics solvent & Aromatic solvent, use with a soft cloth soaked with acleaning 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

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