深圳市勋瑞光电科技有限公司

Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

Product Specification

Customer: _____

Model Name: H031BWV45I3001

Date: _____

Version: _____

■ **Preliminary Specification**

☐ **Final Specification**

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

深圳市勋瑞光电科技有限公司

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Contents

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Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

History of Version

Date	Ver.	Edi.	Description	Page	Design by
2023-03-09	**01**		**New Sample**	**-**	

Total: 22Page

1. SPECIFICATIONS

1.1 Features

Main LCD Panel

Item	Standard Value
Display Type	480 * (R、G、B) * 800 Dots
LCD Type	ALL
Screen size(inch)	3.1
Color configuration	R.G.B. vertical stripe
Backlight	6White LED
Interface	RGB 16bit interface
Driver IC	ST7701S-G5
ROHS	THIS PRODUCT CONFORMS THE ROHS

1.2 Mechanical Specifications

Module

Item	Standard Value	Unit
Module Outline Dimension(CTP)	/	mm
LCM Outline Dimension	43.48(W) * 74.72(L) * 2.2 (H)(max)	mm
LCD Active Area	40.32(W) * 67.20 (L)	mm

Note：For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage1	IOVCC	-	-0.3	4.6	V
Power Supply Voltage2	VCI/VCC	-	-0.3	4.6	V
Input Voltage	V_{IN}	-	-0.3	IOVCC+0.3	V
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature	T_{ST}	-	-30	+80	°C

1.4 DC Electrical Characteristics

Module GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage1	IOVCC	-	2.5	2.8	3.3	V
Power Supply Voltage2	VCI/VCC	-	2.5	2.8	3.3	V
Input High Voltage	V_{IH}	-	0.8*IOVCC	-	IOVCC	V
Input Low Voltage	V_{IL}	-	-0.3	-	0.2*IOVCC	V
Output High Voltage	V_{OH}	-	0.8*IOVCC	-	-	V
Output Low Voltage	V_{OL}	-	-	-	0.2*IOVCC	V

Note1:Maximum current display

1.5 Optical Characteristics

TFT LCD Panel VCC=2.8V, Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	unit	
Response time		Tr + Tf	Ta = 25°C θX, θY = 0°	-	30	-	ms	Note2
Contrast ratio		CR	Ta = 25°C θX , θY = 0°	200	250	-	-	Note3
Color of CIE Coordinate (With B/L)	White	X		0.23	0.28	0.32	-	Note1
		Y		0.25	0.30	0.35		
	Red	X		0.58	0.63	0.68		
		Y		0.29	0.34	0.39		
	Green	X		0.29	0.34	0.39		
		Y		0.55	0.60	0.65		
	Blue	X		0.09	0.14	0.19		
		Y		0.02	0.07	0.12		
Average Brightness Pattern= white (With TP)		IV	IF= 20mA	-	180	-	cd/m2	Note1
Uniformity (With B/L)		△B	IF= 20mA	80	-	-	%	Note1

Note1:

1：△B=B(min) / B(max) ×100%

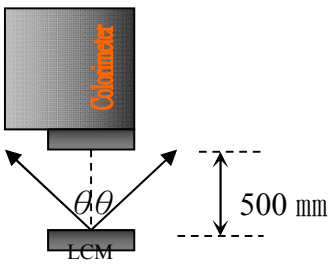
2：Measurement Condition for Optical Characteristics:

a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%

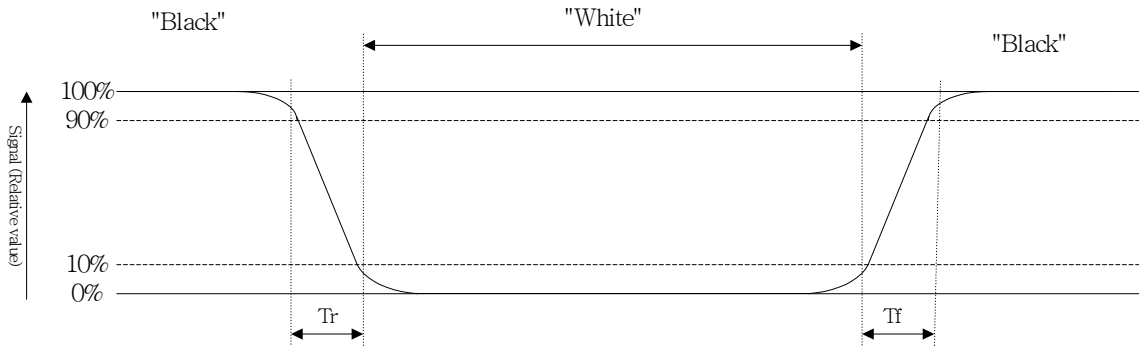


Colorimeter=BM-7 fast

Note2: Definition of response time:

The output signals of photo detector 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 is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:



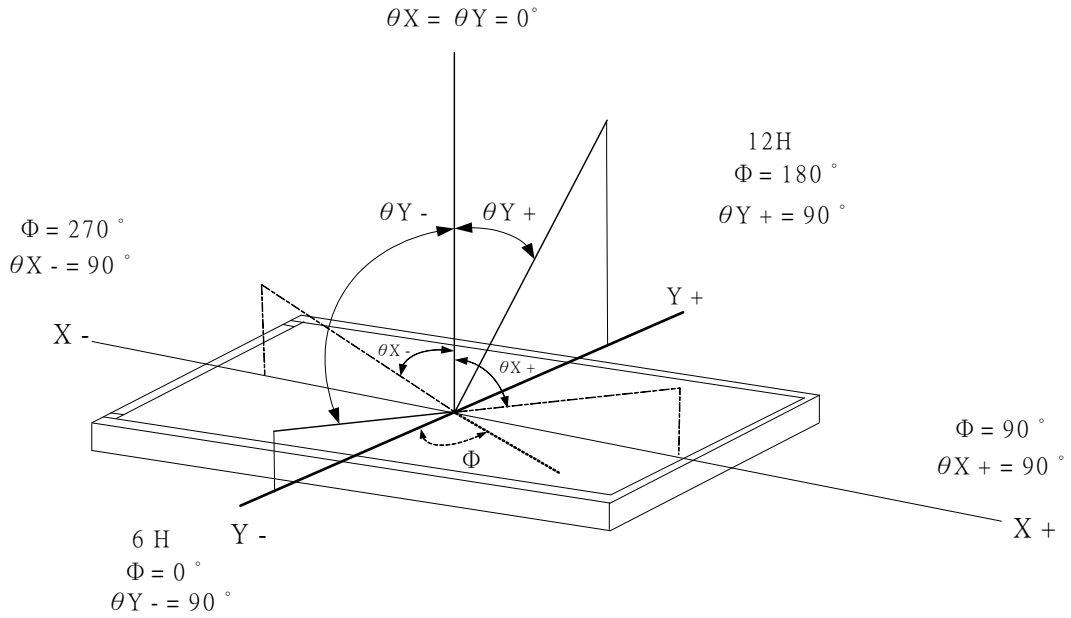
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at “White” state}}{\text{Photo detector output when LCD is at “Black” state}}$$

Note4: Definition of viewing angle:

Refer to figure as below:



1.6 Backlight & LED Characteristics

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 20mA	-	18	-	V
Average Brightness (without LCD)	IV		-	-	-	cd/m^2
Color of CIE Coordinate (without LCD)	X		0.24	0.28	0.32	-
	Y		0.24	0.28	0.32	
Color	White					

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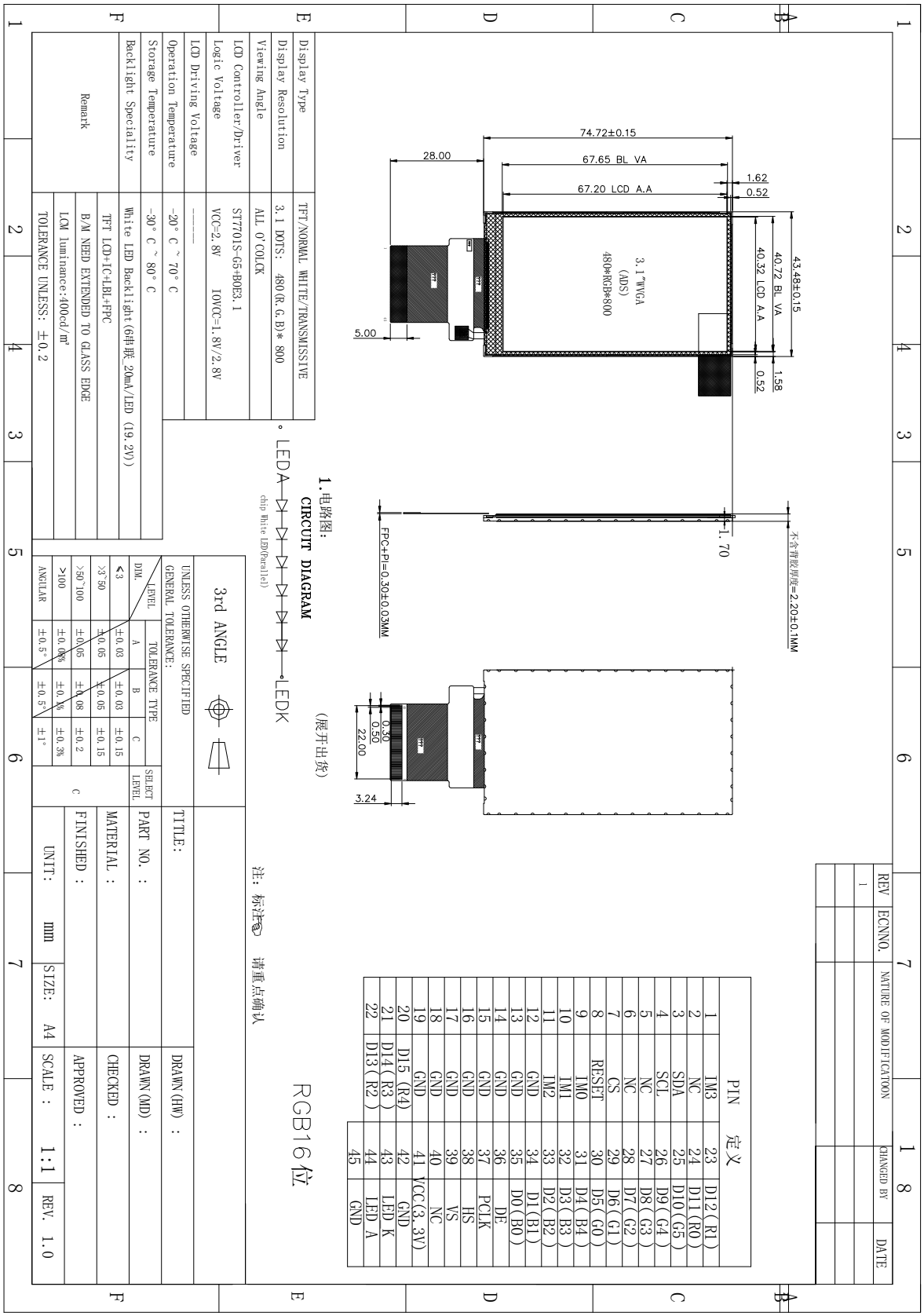
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram



Display Type	TFT/NORMAL WHITE/TRANSMISSIVE
Display Resolution	3.1 DOTS: 480(R.G.B)* 800
Viewing Angle	ALL 0' CLOCK
LCD Controller/Driver	ST7701S-G5-BOE3.1
Logic Voltage	VCC=2.8V IOVCC=1.8V/2.8V
LCD Driving Voltage	------
Operation Temperature	-20° C ~ 70° C
Storage Temperature	-30° C ~ 80° C
Backlight Speciality	White LED Backlight(6串联_20mA/LED (19.2V))
Remark	TFT LCD+IC+LBL+FPC
	B/M NEED EXTENDED TO GLASS EDGE
	LCM luminance:400cd/m²
	TOLERANCE UNLESS: ±0.2

PIN	定义
1	IM3
2	NC
3	SDA
4	SCL
5	NC
6	NC
7	CS
8	RESET
9	IM0
10	IM1
11	IM2
12	GND
13	GND
14	GND
15	GND
16	GND
17	GND
18	GND
19	GND
20	D15 (R4)
21	D14 (R3)
22	D13 (R2)
23	D12 (R1)
24	D11 (R0)
25	D10 (G5)
26	D9 (G4)
27	D8 (G3)
28	D7 (G2)
29	D6 (G1)
30	D5 (G0)
31	D4 (B4)
32	D3 (B3)
33	D2 (B2)
34	D1 (B1)
35	D0 (B0)
36	DE
37	PCLK
38	HS
39	VS
40	NC
41	VCC(3.3V)
42	GND
43	LED K
44	LED A
45	GND

2.2 Interface Pin Description

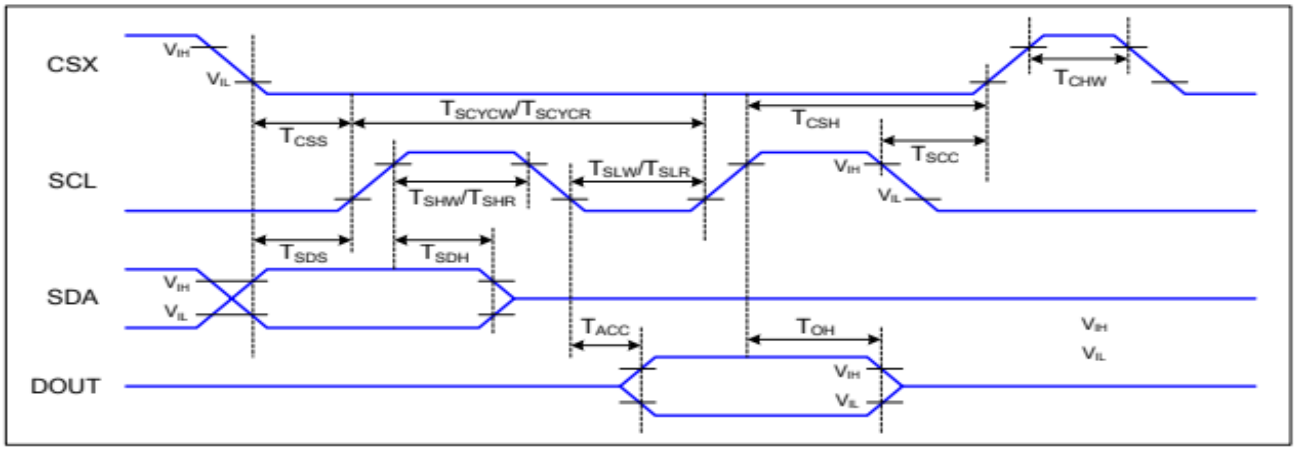
Pin No.	Symbol	Function
1	IM3	/
2	NC	NC
3	SDA	Serial data input pin in serial bus system interface **When not inuse=>GND**
4	SCK	IIC CLOCK
5	NC	NC
6	NC	NC
7	/CS	Chip select
8	RESET	System reset active at “LOW”
9	IM0	/
10	IM1	/
11	IM2	/
12	GND	System ground(0V)
13	GND	System ground(0V)
14	GND	System ground(0V)
15	GND	System ground(0V)
16	GND	**Enable pin**
17	GND	Data bus
18	GND	Data bus
19	GND	Data bus
20	R4	Data bus
21	R3	Data bus
22	R2	Data bus
23	R1	Data bus

24	R0	Data bus
25	G5	Data bus
26	G4	Data bus
27	G3	Data bus
28	G2	Data bus
29	G1	Data bus
30	G0	Data bus
31	B4	Data bus
32	B3	Data bus
33	B2	Data bus
34	B1	Data bus
35	B0	Data bus
36	DE	**Enable pin**
37	PCLK	clock signal in RGB interface. **When not inuse=>GND**
38	HSYNC	Horizontal synchronizing signal in RGB interface **When not inuse=>GND**
39	VSYNC	Vertical synchronizing signal in RGB interface. **When not inuse=>GND**
40	NC	NC
41	VCI	Power supply (2.8V)
42	GND	System ground(0V)
43	LEDK1	Power suplly for led backlight cathode input
44	LEDA1	Power suplly for led backlight anode input
45	GND	System ground(0V)

IM3	IM2	IM1	IM0	MPU Interface Mode
0	0	0	1	RGB+8b SPI(fall)
0	0	1	0	RGB+9b SPI(fall)
0	0	1	1	RGB+16b SPI(rise)
0/1	1	0	1	MIPI
0	1	1	0	MIPI+16b SPI(rise)
1	0	0	1	RGB+8b SPI(rise)
1	0	1	0	RGB+9b SPI(rise)
1	0	1	1	RGB+16b SPI(fall)
1	1	1	0	MIPI+16b SPI(fall)

2.3 Timin Characteristics

Serial Interface Characteristics (3-line serial):



VDDI=1.8,VDD=2.8, AGND=DGND=0V, Ta=25℃

Signal	Symbol	Parameter	Min	Max	Unit	Description
CSX	T_{CSS}	Chip select setup time (write)	15		ns	
	T_{CSH}	Chip select hold time (write)	15		ns	
	T_{CSS}	Chip select setup time (read)	60		ns	
	T_{SCC}	Chip select hold time (read)	60		ns	
	T_{CHW}	Chip select "H" pulse width	40		ns	
SCL	T_{SCYCW}	Serial clock cycle (Write)	66		ns	
	T_{SHW}	SCL "H" pulse width (Write)	15		ns	
	T_{SLW}	SCL "L" pulse width (Write)	15		ns	
	T_{SCYCR}	Serial clock cycle (Read)	150		ns	
	T_{SHR}	SCL "H" pulse width (Read)	60		ns	
	T_{SLR}	SCL "L" pulse width (Read)	60		ns	
SDA (DIN)	T_{SDS}	Data setup time	10		ns	
	T_{SDH}	Data hold time	10		ns	

Table 4 3-line serial Interface Characteristics

Note : The rising time and falling time (Tr, Tf) of input signal are specified at 15 ns or less. Logic high and low levels are specified as 30% and 70% of VDDI for Input signals.

RGB Interface Characteristics :

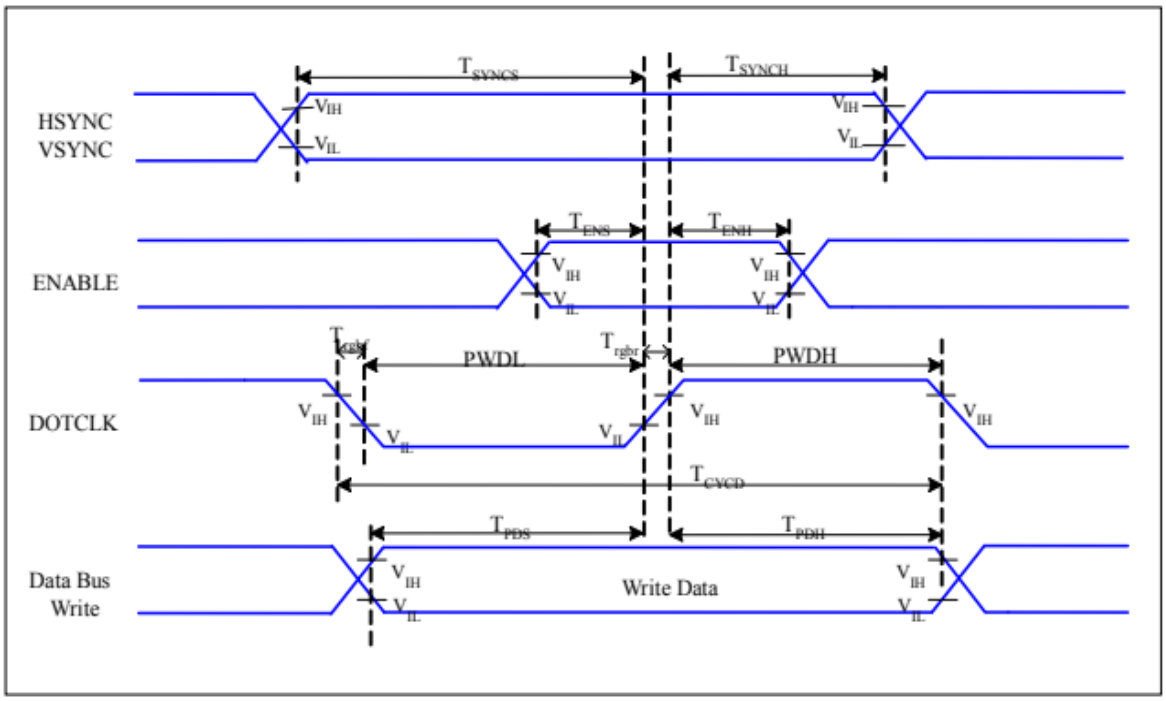


Figure 3 RGB Interface Timing Characteristics

VDDI=1.8,VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
HSYNC, VSYNC	T_{SYNCS}	VSYNC, HSYNC Setup Time	5	-	ns	
ENABLE	T_{ENS}	Enable Setup Time	5	-	ns	
	T_{ENH}	Enable Hold Time	5	-	ns	
DOTCLK	PWDH	DOTCLK High-level Pulse Width	15	-	ns	
	PWDL	DOTCLK Low-level Pulse Width	15	-	ns	
	T_{CYCD}	DOTCLK Cycle Time	33	-	ns	
	Trghr, Trghf	DOTCLK Rise/Fall time	-	15	ns	
DB	T_{PDS}	PD Data Setup Time	5	-	ns	
	T_{PDH}	PD Data Hold Time	5	-	ns	

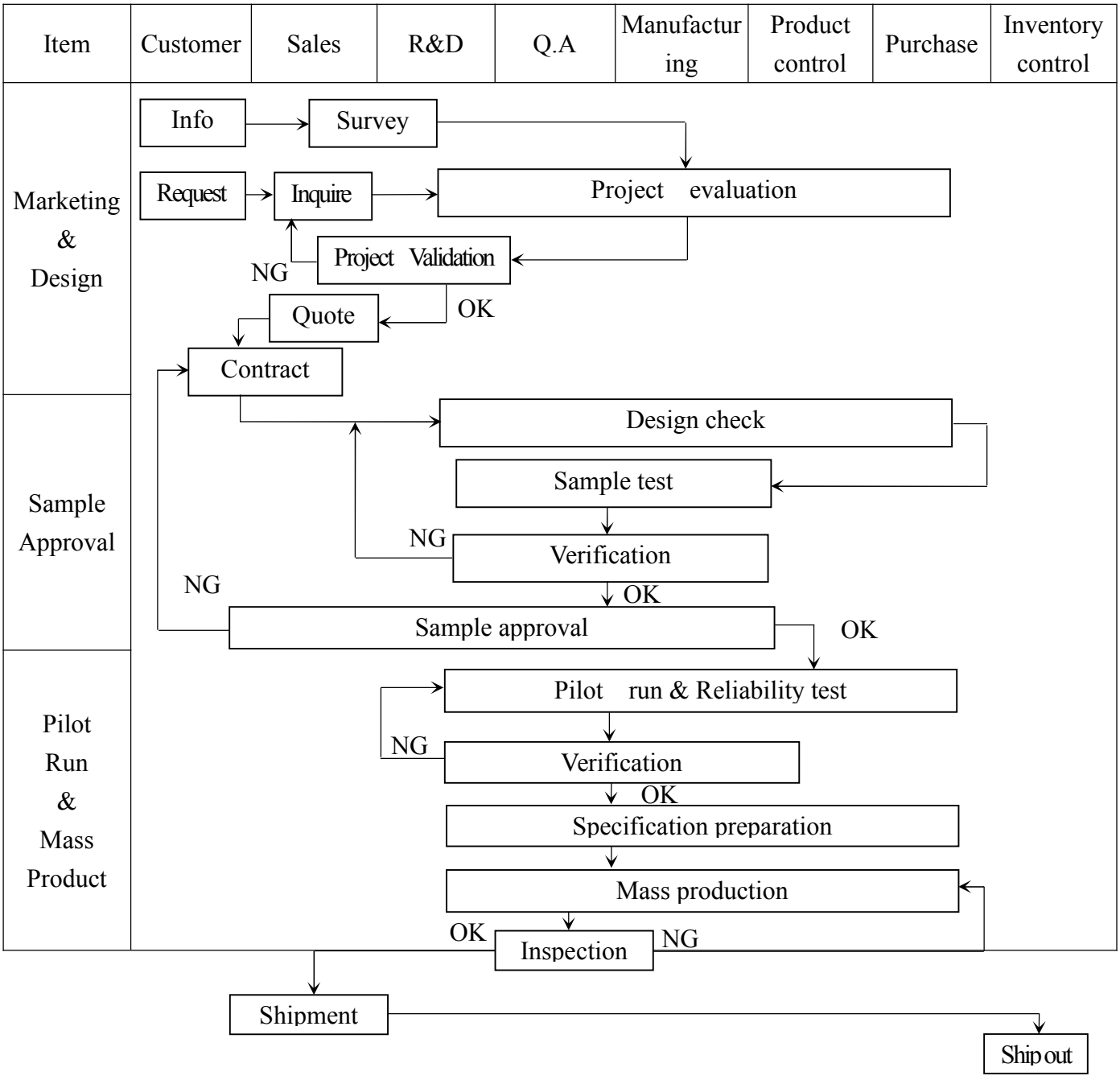
Table 6 18/16 Bits RGB Interface Timing Characteristics

2.3.2 Reset Timing Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
RESET low-level width	tRES	1	-	-	ms
RESET rise time	trRES	-	-	10	s
Reset high-level width	tRES_H	50			ms

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



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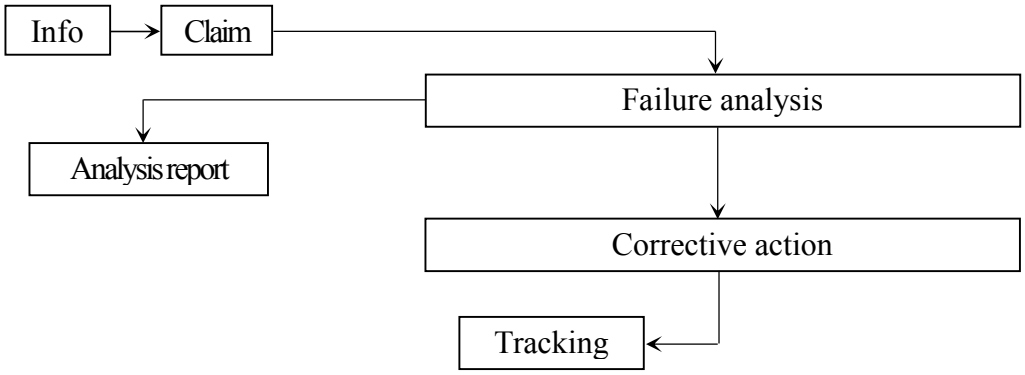
Ship Out	

Item	Customer	Sales	R&D	Q.A	Manufactu ring	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education And Training Activities			

3.2 Inspection Specification

◆Scope ：The document shall be applied to

◆Inspection Standard：MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ.

◆Equipment：Gauge、MIL-STD、Powertip Tester、Sample

◆Defect Level：Major Defect AQL： 0.65 ； Minor Defect AQL： 1.5

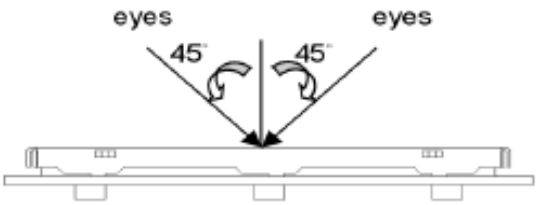
◆OUT Going Defect Level：Sampling.

◆Standard of the product appearance test：

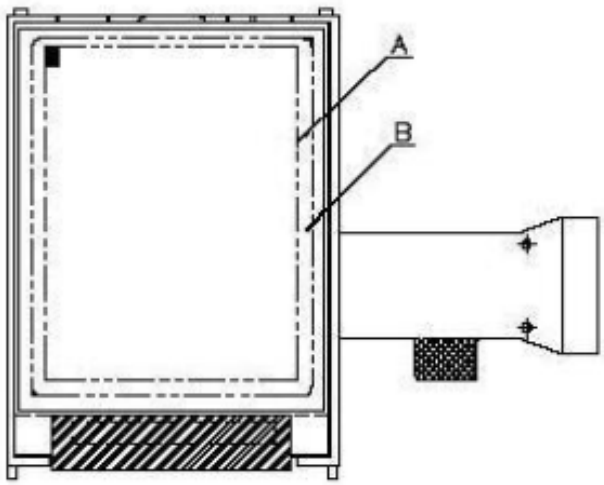
a. Manner of appearance test：

(1). The test best be under 20W×2 fluorescent light，and distance of view must be at 30 cm.

(2). The test direction is base on about around 45° of vertical line.



(3). Definition of area.

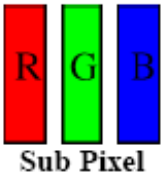


A area：Active Area

B area：Outside of Active Area

(4). Standard of inspection： (Unit：mm)

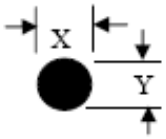
◆Specification For

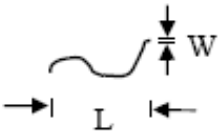
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1. 1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1. 2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1. 3 Assembled in inverse direction.</td><td>Major</td></tr>
<tr><td>02</td><td>Quantity</td><td>The quantity is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>03</td><td>Outline dimension</td><td>Product dimension and structure must conform to structure diagram.</td><td>Major</td></tr>
<tr><td rowspan="5">04</td><td rowspan="5">Electrical Testing</td><td>4. 1 Missing line character and icon.</td><td>Major</td></tr>
<tr><td>4. 2 No function or no display.</td><td>Major</td></tr>
<tr><td>4. 3 Display malfunction.</td><td>Major</td></tr>
<tr><td>4. 4 LCD viewing angle defect.</td><td>Major</td></tr>
<tr><td>4. 5 Current consumption exceeds product specifications.</td><td>Major</td></tr>
<tr><td>05</td><td>Dot defect
(Bright dot、Dark dot)
On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q'ty)</th></tr>
<tr><td rowspan="2">Dot Defect (Sub Pixel)</td><td>Bright Dot</td><td>≦ 3</td></tr>
<tr><td>Joint Dot</td><td>≦ 2</td></tr>
<tr><td>Pixel Defect</td><td>Bright Dot</td><td>≦ 1</td></tr>
</table>
5. 1 Inspection pattern：full white , full black , Red , Green and blue screens.
5. 2 It is defined as dot defect if defect area ＞1/2 dot.
5. 3 The distance between two dot defect ≧5 mm.


Sub Pixel
(alone R orG orB)


Pixel
(R+G+B)
</td><td>Minor</td></tr>
</table>

◆Specification For

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>06</td><td>Round type
 

Φ=(x+y) / 2</td><td>6. 1 Clear Spots：
<table>
<tr><th rowspan="2">Dimension
(diameter：Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>A area</th><th>B area</th></tr>
<tr><td>Φ ≦ 0. 15</td><td>Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0. 15 ＜ Φ ≦ 0. 20</td><td>3</td></tr>
<tr><td>0. 20 ＜ Φ ≦ 0. 30</td><td>3</td></tr>
<tr><td>Φ ＞ 0. 30</td><td>0</td></tr>
</table>
6. 2 Dim Spots：
<table>
<tr><th rowspan="2">Dimension
(diameter：Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>A area</th><th>B area</th></tr>
<tr><td>Φ ≦ 0. 2</td><td>Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0. 2 ＜ Φ ≦ 0. 4</td><td>3</td></tr>
<tr><td>0. 4 ＜ Φ ≦ 0. 6</td><td>1</td></tr>
<tr><td>Φ ＞ 0. 6</td><td>0</td></tr>
</table>
※Ignore 6.2 that can be removed.</td><td>Minor</td></tr>
<tr><td>07</td><td>Line type
 

Φ=(x+y) / 2</td><td>7. 1 Line：
<table>
<tr><th colspan="2">Dimension</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>Length (L)</th><th>Width (W)</th><th>A area</th><th>B area</th></tr>
<tr><td>---</td><td>W ≦ 0. 03</td><td>Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>L ≦5</td><td>0. 03 ＜W ≦ 0. 05</td><td>4</td></tr>
<tr><td>L ≦5</td><td>0. 05 ＜W ≦ 0. 1</td><td>3</td></tr>
<tr><td></td><td>W ＞0. 1</td><td>As round type</td></tr>
</table>
7. 2 Scratch：
<table>
<tr><th colspan="2">Dimension</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>Length (L)</th><th>Width (W)</th><th>A area</th><th>B area</th></tr>
<tr><td>---</td><td>W ≦ 0. 03</td><td>Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>L ≦5</td><td>0. 03 ＜W ≦ 0. 05</td><td>4</td></tr>
<tr><td>L ≦5</td><td>0. 05 ＜W ≦ 0. 1</td><td>3</td></tr>
<tr><td></td><td>W ＞0. 1</td><td>As round type</td></tr>
</table>
※Ignore 7.1 that can be removed.</td><td>Minor</td></tr>
</table>

◆Specification For

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</td><td>Bubble / Dent</td><td>
<table>
<tr><th rowspan="2">Dimension (diameter：Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>A area</th><th>B area</th></tr>
<tr><td>Φ ≦ 0.2</td><td>Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.2 ＜ Φ ≦ 0.4</td><td>3</td></tr>
<tr><td>0.4 ＜ Φ ≦ 0.5</td><td>1</td></tr>
<tr><td>Φ ＞ 0.5</td><td>0</td></tr>
</table>
</td><td>Minor</td></tr>
<tr><td rowspan="3">09</td><td rowspan="3">Backlight elements</td><td>9.1 Backlight can't work normally.</td><td>Major</td></tr>
<tr><td>9.2 Backlight doesn't light or color is wrong.</td><td>Major</td></tr>
<tr><td>9.3 Illumination source flickers when lit.</td><td>Major</td></tr>
<tr><td>10</td><td>Newton's ring</td><td>N: Area of Newton's ring
VA: LCM View Area
N≦1/2*VA</td><td>Minor</td></tr>
<tr><td rowspan="6">11</td><td rowspan="6">General appearance</td><td>11.1 Pin type、quantity、dimension must match type in structure diagram.</td><td>Major</td></tr>
<tr><td>11.2 No short circuits in components on PCB or FPC .</td><td>Major</td></tr>
<tr><td>11.3 Parts on PCB or FPC must be the same as on the production characteristic chart .There should be no wrong parts , missing parts or excess parts.</td><td>Major</td></tr>
<tr><td>11.4 Product packaging must the same as specified on packaging specification sheet.</td><td>Minor</td></tr>
<tr><td>11.5 The folding and peeled off in polarizer are not acceptable.</td><td>Minor</td></tr>
<tr><td>11.6 The PCB or FPC between B/L assembled distance(PCB or FPC) is ≦1.5 mm.</td><td>Minor</td></tr>
</table>

4. RELIABILITY TEST

<table>
<tr><th>NO.</th><th>TEST ITEM</th><th>TEST CONDITION</th><th>Judgment Standard</th></tr>
<tr><td>1</td><td>High Temperature Storage Test</td><td>Keep in +80 ±2℃ 72 hrs, Humidity: Except,
Surrounding temperature, then storage at normal condition 4hrs.</td><td rowspan="6">Note1</td></tr>
<tr><td>2</td><td>Low Temperature Storage Test</td><td>Keep in -30 ±2℃ 72 hrs ,Humidity: Except,
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>3</td><td>High Temperature Operation test</td><td>Endurance test applying the electric stress under +70 ±2℃
72hrs ,Humidity: Except,then storage at normal condition 4hrs.</td></tr>
<tr><td>4</td><td>Low Temperature Operation test</td><td>Endurance test applying the electric stress under -20 ±2℃ 72
hrse ,Humidity: Except,then storage at normal condition 4hrs.</td></tr>
<tr><td>5</td><td>High Temperature / High Humidity Storage Test</td><td>Keep in +60℃ / 90% R.H duration for 72 hrs
Surrounding temperature, then storage at normal condition 4hrs.
(Excluding the polarizer)</td></tr>
<tr><td>6</td><td>Temperature Cycling Storage Test</td><td>-20℃ → +25℃ → +70℃ → +25℃
(30mins) (5mins) (30mins) (5mins)
10 Cycle
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>7</td><td>ESD Test</td><td>Air Discharge:
Apply 4KV with 5 times
Discharge for each polarity +/-
Contact Discharge:
Apply 2KV with 5 times
discharge for each polarity +/-
1. Temperature ambiance:15℃～35℃
2. Humidity relative:30%～60%
3. Energy Storage Capacitance(Cs+Cd):150pF±10%
4. Discharge Resistance(Rd):330Ω±10%
5. Discharge, mode of operation:
Single Discharge (time between successive discharges at least 1 s)
(Tolerance if the output voltage indication: ±5%)</td><td>Note2</td></tr>
<tr><td>8</td><td>Vibration Test (Packaged)</td><td>1. Sine wave 10～55 Hz frequency (1 min)
2. The amplitude of vibration :1. 5 mm
3. Each direction (X、Y、Z) duration for 2 Hrs</td><td rowspan="2">Note3</td></tr>
<tr><td>9</td><td>Drop Test (Packaged)</td><td><table><tr><th>Package Weight (W)</th><th>Drop Height (cm)</th></tr><tr><td>W≦ 9 Kg</td><td>100</td></tr><tr><td>9 Kg < W ≤18 Kg</td><td>80</td></tr><tr><td>W＞18 Kg</td><td>60</td></tr></table>Drop direction :※ 1 corner / 3 edges / 6 sides each 1times</td></tr>
</table>

※**Note1**：a.No LC air bubble & leakage.
b.No display function related objection contrast before test.
※**Note2**：No error of operational function after rebooting.
※**Note3**：The inspection of appearance、the whole structure no error.

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

5.2.1 Avoid any strong mechanical shock which can break the glass.

5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.

5.2.3 Do not remove the panel or frame from the module.

5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully, do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.

5.2.6 Do not touch the display area with bare hands , this will stain the display area.

5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8 To control temperature and time of soldering is 320 ± 10°C and 3-5 sec.

5.2.9 To avoid liquid (include organic solvent) stained on LCM

5.3 STORAGE

5.3.1 Store the panel or module in a dark place where the temperature is 25°C ± 5°C and the humidity is below 65% RH.

5.3.2 Do not place the module near organics solvents or corrosive gases.
5.3.3 Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

5.4.1 Applicable warrant period

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

5.4.2 Unaccepted responsibility

This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in nuclear power control equipment, aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.