DATA MODUL

TIANMA

SPECIFICATION

P0800WVF1MA00

8" – WVGA – LVDS

Version: 5.0
Date: 06.02.2023

Note: This specification is subject to change without prior notice

SPECIFICATION

[ ] Preliminary Specification
[◉] Final Specification

Description **8” 800xRGBx480 TFT-LCD Module**

Part Number **P0800WVF1MA00**

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* This cover page is for your Comments and Signatures back to TIANMA.

REVISION HISTORY

Rev	Date	Page	Revision Items	Editor
1.0	2020/12/23	-	Preliminary spec	Alex Xiao
2.0	2021/06/15	-	1.DE Mode definition (Page 5: 6. Interface Timing Characteristics (DE mode)) 2.JEIDA mode definition (Page 2: 3.1 CN1 Pin assignment (LCD Interface)	Alex Xiao
3.0	2022/02/22	-	Final spec	Yang Yang
4.0	2022/12/26	-	1.Drawing(Page17) 2.LCD Module connector &Marching connector (Page3),BLU FPC connector & Marching connector (Page4)	Yang Yang
5.0	2023/02/06	-	1. Viewing Angle(Page13) 2. Contrast Ratio(Page13)	Yang Yang

CONTENTS

1. Summary

1.1 General Description

This is a 8 inch a-Si TFT-LCD module with Normal- Black technology. It is composed of a TFT-LCD panel, a driver circuit of PCB, and a LED backlight unit.

1.2 Features

- Ultra-wide viewing angle (Super Fine TFT (SFT))
- High luminance
- Long LED life time
- Wide temperature range
- Interface: LVDS
- LED driver integrated
- Readable with polarized sunglass
- Compliant with the European RoHS Directive (2011/65/EU) and Delegated Directive (2015/863/EU, Amending Annex II of 2011/65/EU)

2. General Specifications

Feature		Spec	Unit
Display Spec	Size	8 inches	
	Resolution	800(RGB)x480	
	Pixel Pitch	0.2175x0.2175	mm
	TFT Active Area	174.0 x 104.4	mm
	Technology Type	a-Si	
	Pixel Configuration	R.G.B Vertical Stripe	
	Display Mode	Normally Black	
	Surface Treatment	Hard Coating	
Mechanical Characteristics	LCM (W x H x D)	192x 122 x 8.9(Typ.)	mm
	Weight	235	g
Optical Characteristics	Luminance	1000	cd/m^2
	Contrast Ratio	1000:1	
	NTSC	70(Typ)	%
	Viewing Angle	88/88/88/88(Typ)	degree
Electrical Characteristics	Interface	LVDS	
	Color Depth	16.7 Million	color
	Power Consumption	LCD:363; Backlight:6240	mW

Table 2.1 General TFT Specifications

3. Input / Output Terminals

3.1 CN1 Pin assignment (LCD Interface)

Connector Information	
LCD Module connector	FI-SEB20P-HFE-3000
Marching connector	FI-S20S(JAE)

Table 3.1.1 Connector information

PIN #	Symbol	P/I/O	Description	Remark
1	VCC	P	+3.3V Power supply	--
2	Reset	I	Reset pin, LCD Reset Signal	--
3	Standby	I	Standby mode setting pin. The chip is in standy mode when standy =0V	---
4	GND	P	Ground	Note2
5	Link0-	I	LVDS data 0-	--
6	Link0+	I	LVDS data 0+	--
7	GND	P	Ground	Note2
8	Link1-	I	LVDS data 1-	--
9	Link1+	I	LVDS data 1+	--
10	GND	P	Ground	Note2
11	Link2-	I	LVDS data 2-	--
12	Link2+	I	LVDS data 2+	--
13	GND	P	Ground	Note2
14	CLKIN-	I	LVDS clock -	--
15	CLKIN+	I	LVDS clock +	--
16	GND	P	Ground	Note2
17	Link3-	I	LVDS data 3-	--
18	Link3+	I	LVDS data 3+	--
19	MODE	I	Low=LVDS 6 bit High=LVDS 8 bit JEIDA format	--
20	SC	I	Scan direction control (Low=Normal,High=Reverse)	Note3

Table 3.1.1 Pin Assignment for LCD Interface

Note1: I/O definition

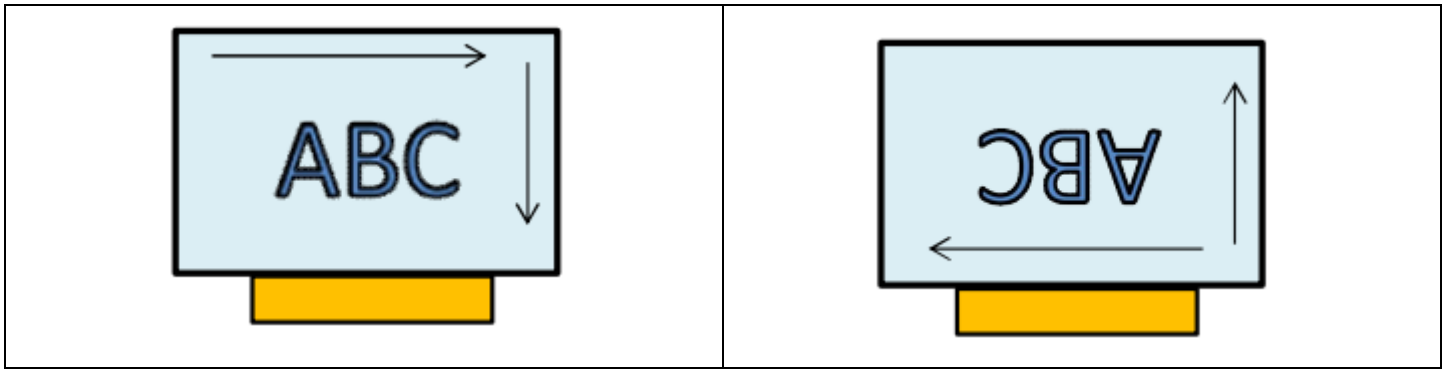
I---Input, O---Output, I/O---input/output P---Power/Ground, N ---No connection

Note2: All of the GND pins should be connected to the system ground.

Note3:

Scan direction control	Scanning Direction
SC	
L	Up to down, Left to right
H	Down to up, Right to left

SC=L	SC=H
from left to right,from up to down	from right to left,from down to up



3.2 CN2 Pin assignment (BL Interface)

Connector Information	
BLU FPC connector	FI-S6P-HFE-E1500
Marching connector	FI-S6S(JAE)

PIN #	Symbol	P/I/O	Description	Remark
1	VL	P	Power Supply Input Voltage	--
2	VL	P	Power Supply Input Voltage	--
3	GNDL	P	Ground	--
4	GNDL	P	Ground	--
5	BLEN	I	Backlight ON-OFF (High:ON,Low:OFF)	--
6	V PDIM	I	Light Dimming Control (PWM) Input Voltage(Hight active)	--

I/O definition: I---Input, O---Output, P---Power/Ground, N---No connection

Table 3.2.1 Pin Assignment for BL Interface

4. Absolute Maximum Ratings

GND=0V, Ta = 25℃

Item	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.3	3.96	V	Note1
Input voltage	V_{IN}	-0.3	VCC+0.3	V	
Operating Temperature	Top	-30	80	℃	
Storage Temperature	Tst	-30	80	℃	
Relative Humidity	RH	--	≤90	%	Ta≤40℃
		--	≤85	%	40℃ < Ta≤50℃
		--	≤55	%	50℃ < Ta≤60℃
		--	≤36	%	60℃ < Ta≤70℃
		--	≤24	%	70℃ < Ta≤80℃
Absoulte Humidity	AH	--	≤70	g/m³	Ta > 50℃

Table 3 Absolute Maximum Ratings

Note1: Input voltage include Mode,SC

5. Electrical Characteristics

5.1 DC Characteristics for Panel Driving

GND=0V, Ta = 25℃

Item		Symbol	MIN	TYP	MAX	Unit	Remark
System Voltage		VCC	3.0	3.3	3.6	V	
Input Signal Voltage	Low Level	VIL	GND-0.3	-	0.3*VCC	V	
	High Level	VIH	0.7*VCC	-	VCC+0.3	V	
Power Consumption		White Mode (60Hz)	-	363	-	mw	

Table 5.1.1 Operating Voltages

5.2 DC Characteristics for Backlight Driving

Item		Symbol	Min	Typ	Max	Unit	Remark
Backlight power supply voltage		VL	11	12	13	V	
Backlight power supply current		I_{VL}	-	520	-	mA	
Backlight power consumption		W_{VL}	-	6.24	-	W	
Input voltage for V_{PDIM} signal	High level	-	1.2	-	-	V	
	Low level	-	-	-	0.35	V	
Input voltage for BLEN	High level	-	1.5	-	-	V	
	Low level	-	-	-	0.8	V	
V_{PDIM} frequency		F_{PDIM}	200	-	10k	HZ	
V_{PDIM} duty		D	5		100	%	Note1
Operating Life Time		--	100,000	-	--	hrs	Note2

Table 5.2.1 LED Backlight Characteristics

Note 1: According to LED driver IC characteristics, the minimum value of V_{PDIM} duty may vary with V_{PDIM} frequency, higher the frequency, bigger the duty.

Note 2: Optical performance should be evaluated at Ta=25℃ only. If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% of initial brightness. Typical operating life time is estimated data.

5.3 Recommended Power ON/OFF Sequence

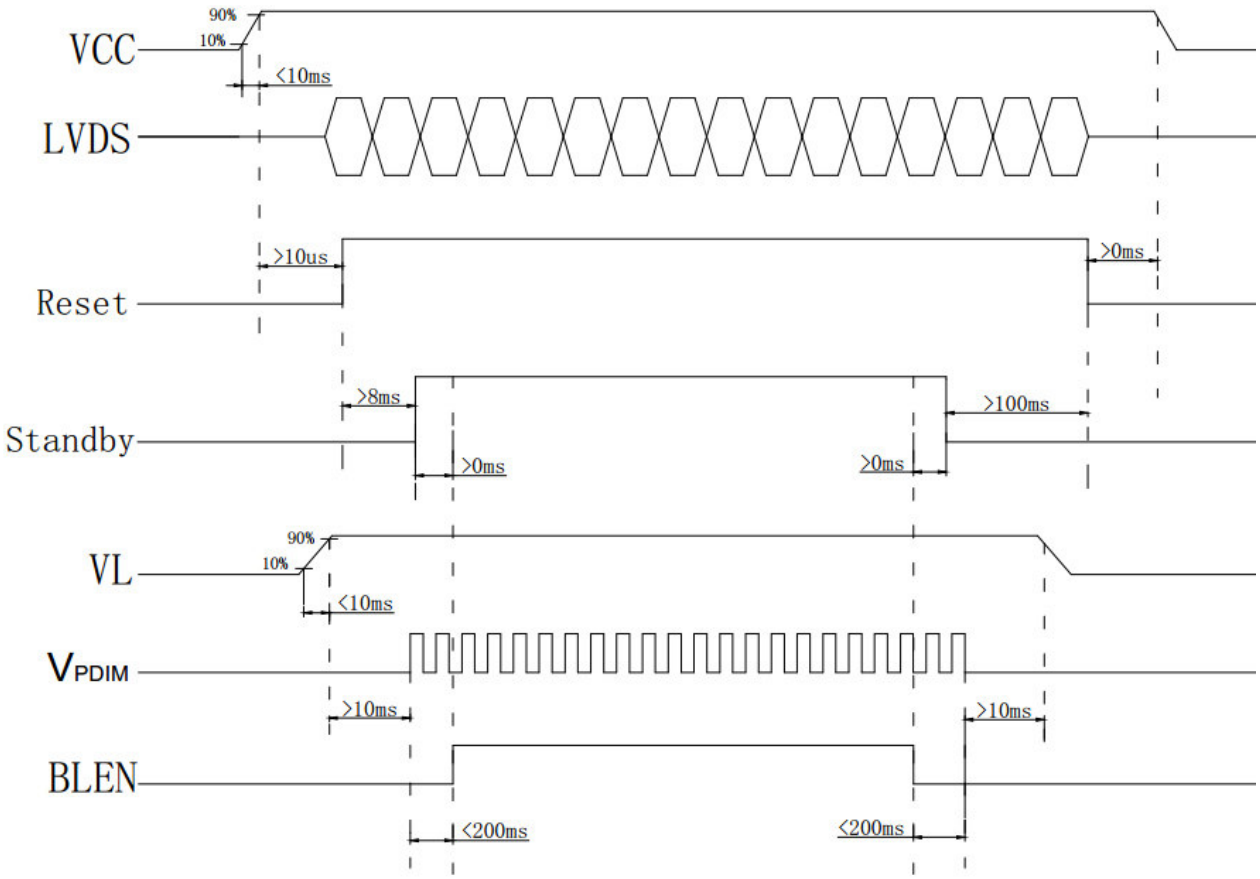


Figure 5.3.1 Power ON/OFF Sequence

5.4 LCD Module Block Diagram

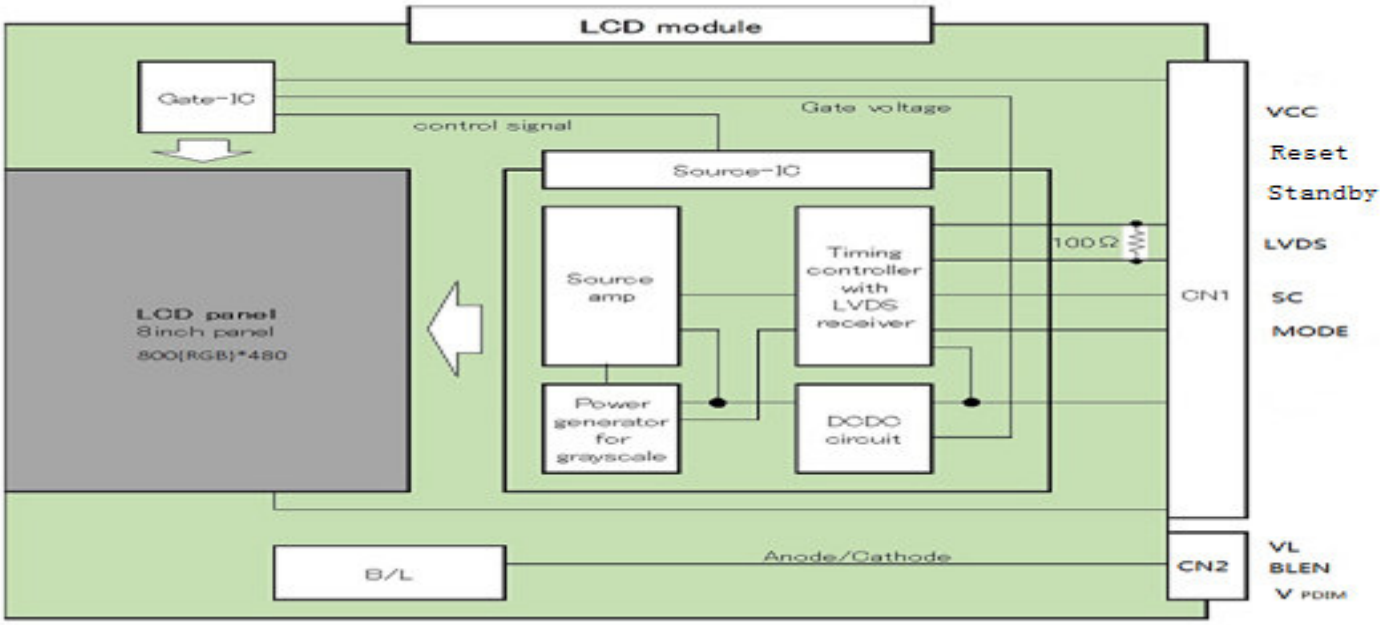


Figure 5.4 LCD Module Block Diagram

6. Interface Timing Characteristics (DE mode)

Parameter		Symbol	Panel Resolution			Unit
			800xRGBx480			
			Min.	Typ.	Max.	
DCLK frequency		FDCLK	28.39	33.26	52.03	MHz
Horizontal section	Horizontal total	Th	910	1056	1138	DCLK
	Horizontal blanking	Thb	110	256	338	DCLK
	Valid Data Width	Thd	800			DCLK
Vertical section	Vertical total	Tv	520	525	762	H
	Vertical blanking	Tvb	40	45	282	H
	Valid Data Width	Tvd	480			H
Frame rate		FR	-	60		Hz

Table 6.1.1 TFT LCD Input Timing(DE mode)

- **Horizontal**

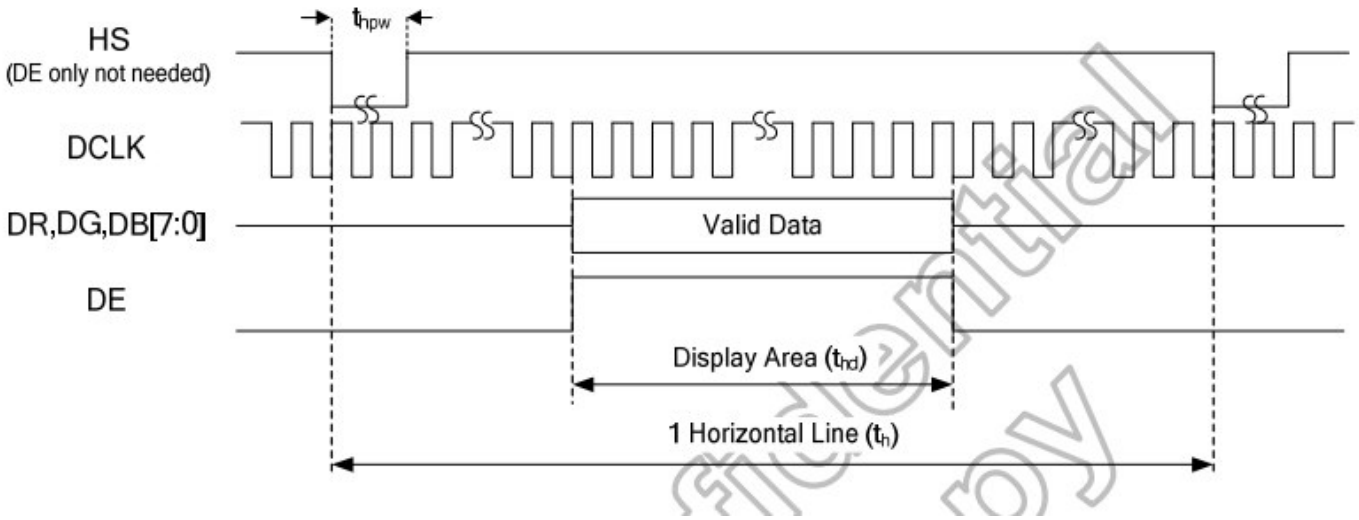


Table 6.1.1 Horizontal Input Timing at DE mode

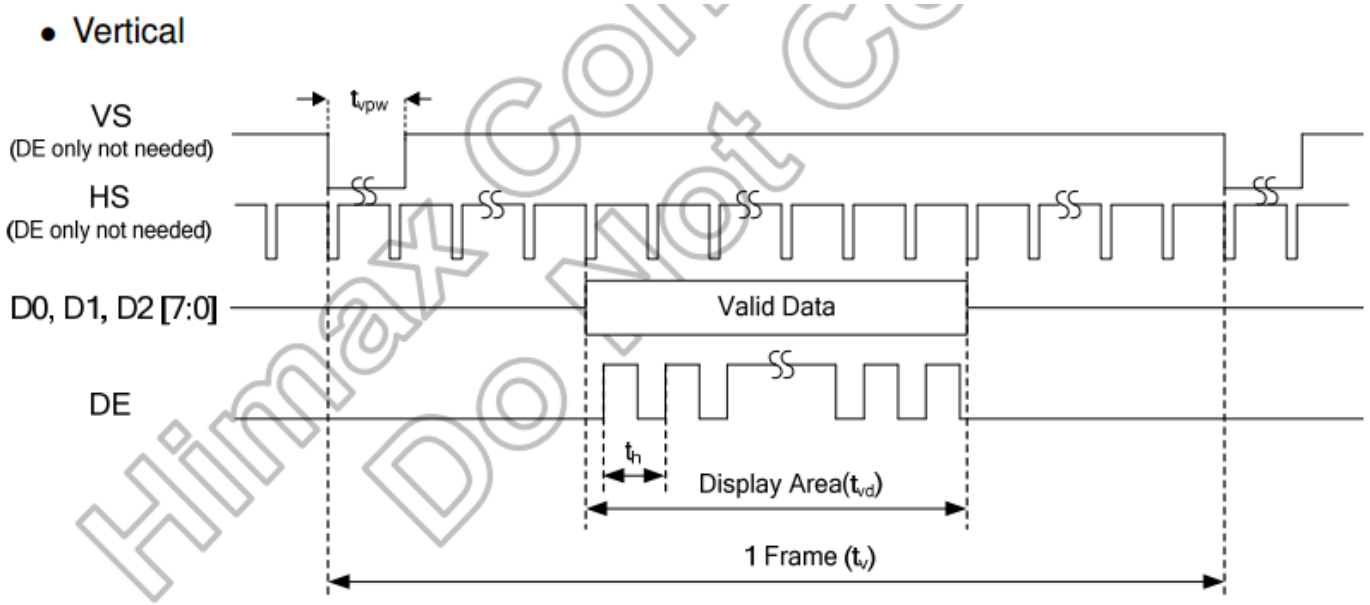


Table 6.1.2 Vertical Input Timing at DE mode

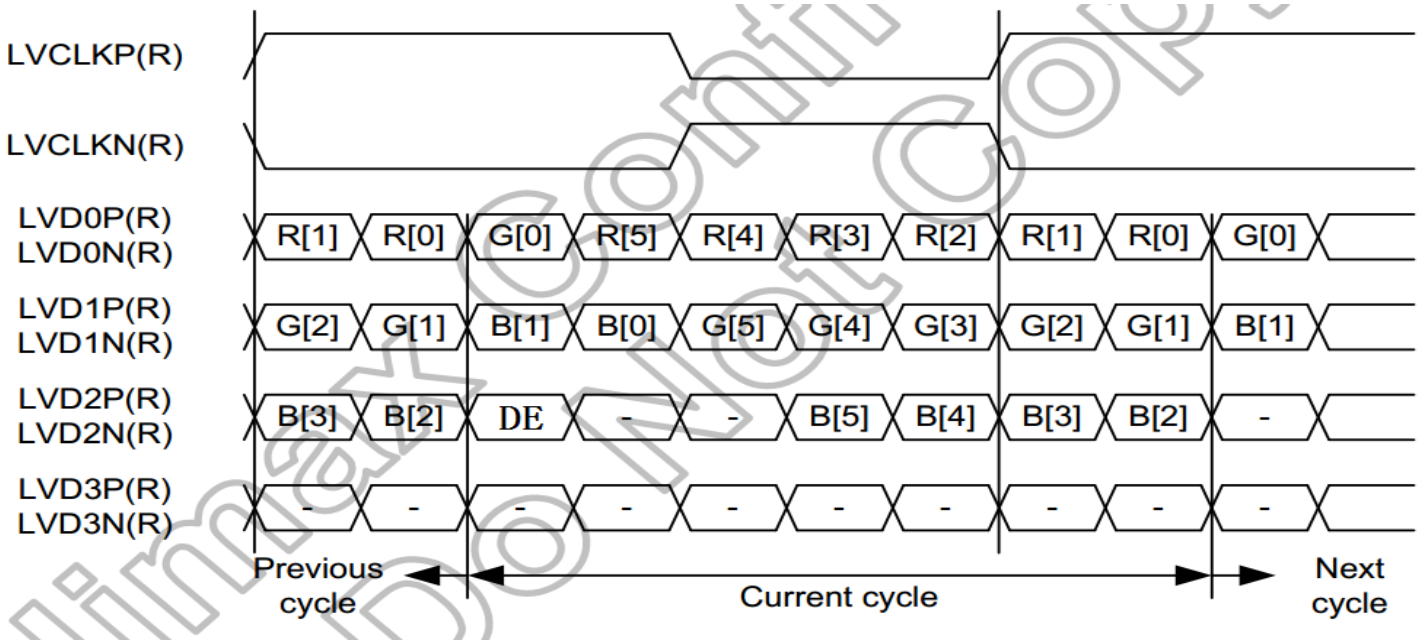


Figure 6.1.3 LVDS 6-bit

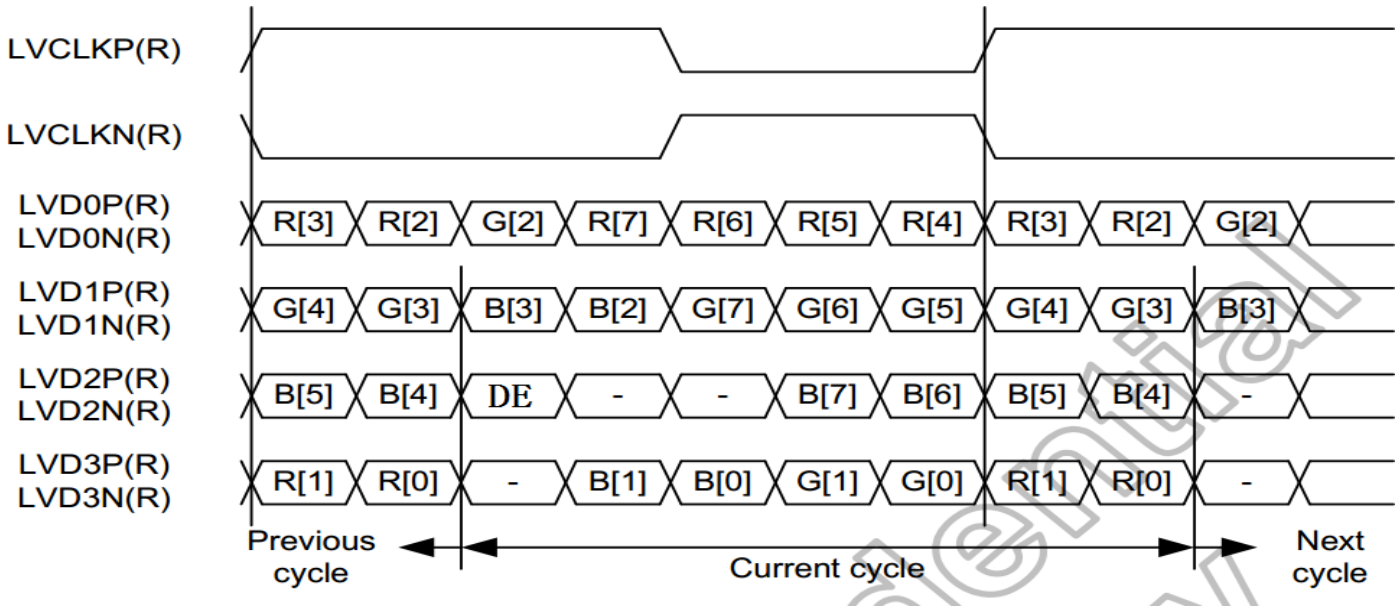


Figure 6.1.4 LVDS 8-bit(JEIDA format)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Differential input high Threshold voltage	V_{th}	Vcm=1.2V	-	-	+0.1	V
Differential input low threshold voltage	V_{tl}	-	-0.1	-	-	V
Differential input common Mode voltage	V_{cm}	-	1	1.2	1.8-|Vid|/2	V
LVDS input voltage	V_{INLV}	-	0.7	-	1.8	V
Differential input voltage	$\|V_{id}\|$	-	0.1	-	0.6	V
Differential input leakage Current	I_{lvleak}	-	-10	-	+10	μA

Table 6.1.5 LVDS Interface

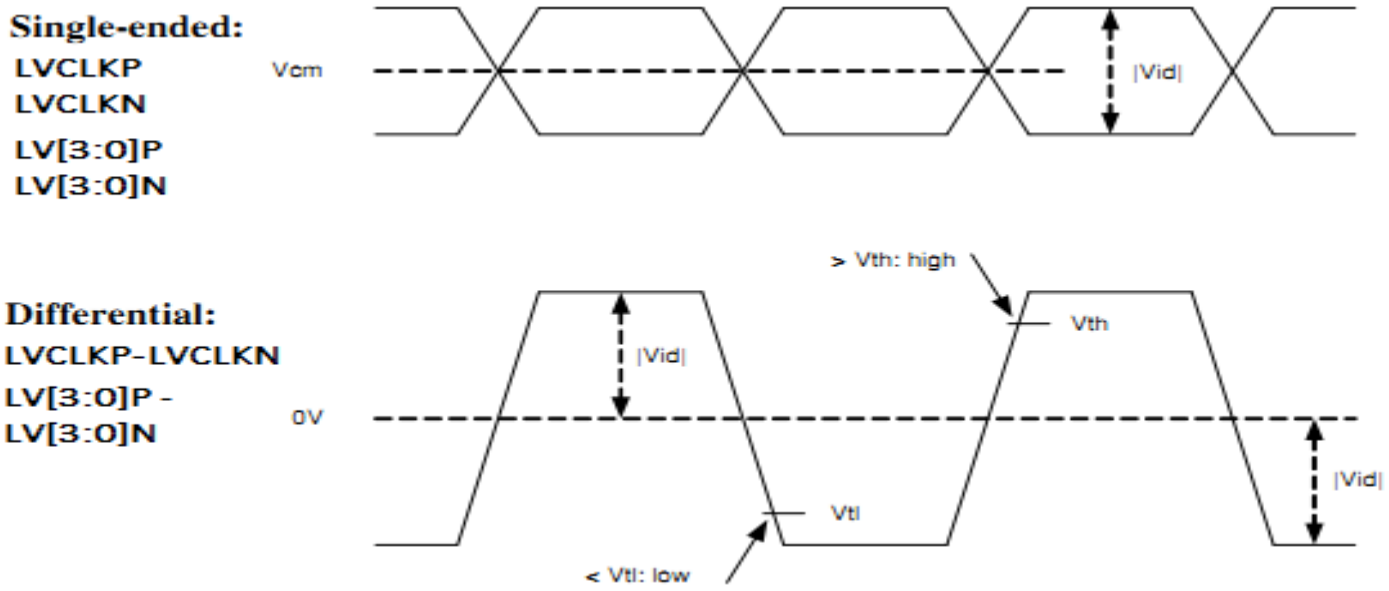


Figure 6.1.6 LVDS Interface

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Clock frequency	FLVCYC	10	-	85	MHz
Clock period	TLVCYC	11.76	-	100	nsec
1 data bit time	UI	-	1/7	-	TLVCYC
Clock high time	LVHW	2.9	4	4.1	UI
Clock low time	LVLW	2.9	3	4.1	UI
Position 1	TPOS1	-0.2	0	0.2	UI
Position 0	TPOS0	0.8	1	1.2	UI
Position 6	TPOS6	1.8	2	2.2	UI
Position 5	TPOS5	2.8	3	3.2	UI
Position 4	TPOS4	3.8	4	4.2	UI
Position 3	TPOS3	4.8	5	5.2	UI
Position 2	TPOS2	5.8	6	6.2	UI
Input eye width	TEYEW	0.6	-	-	UI
Input eye border	TEX	-	-	0.2	UI

Table 6.1.7. LVDS input timing parameters

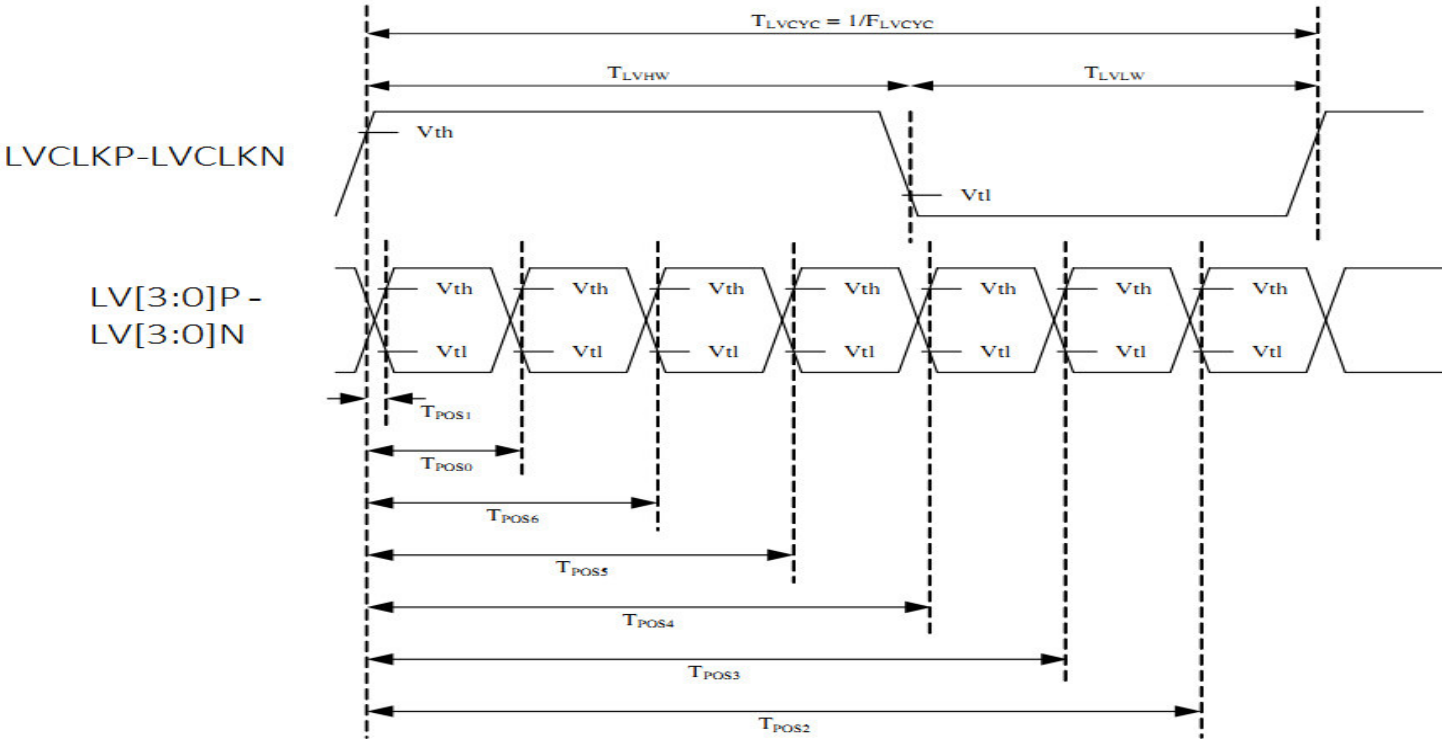


Figure 6.1.8 LVDS input timing

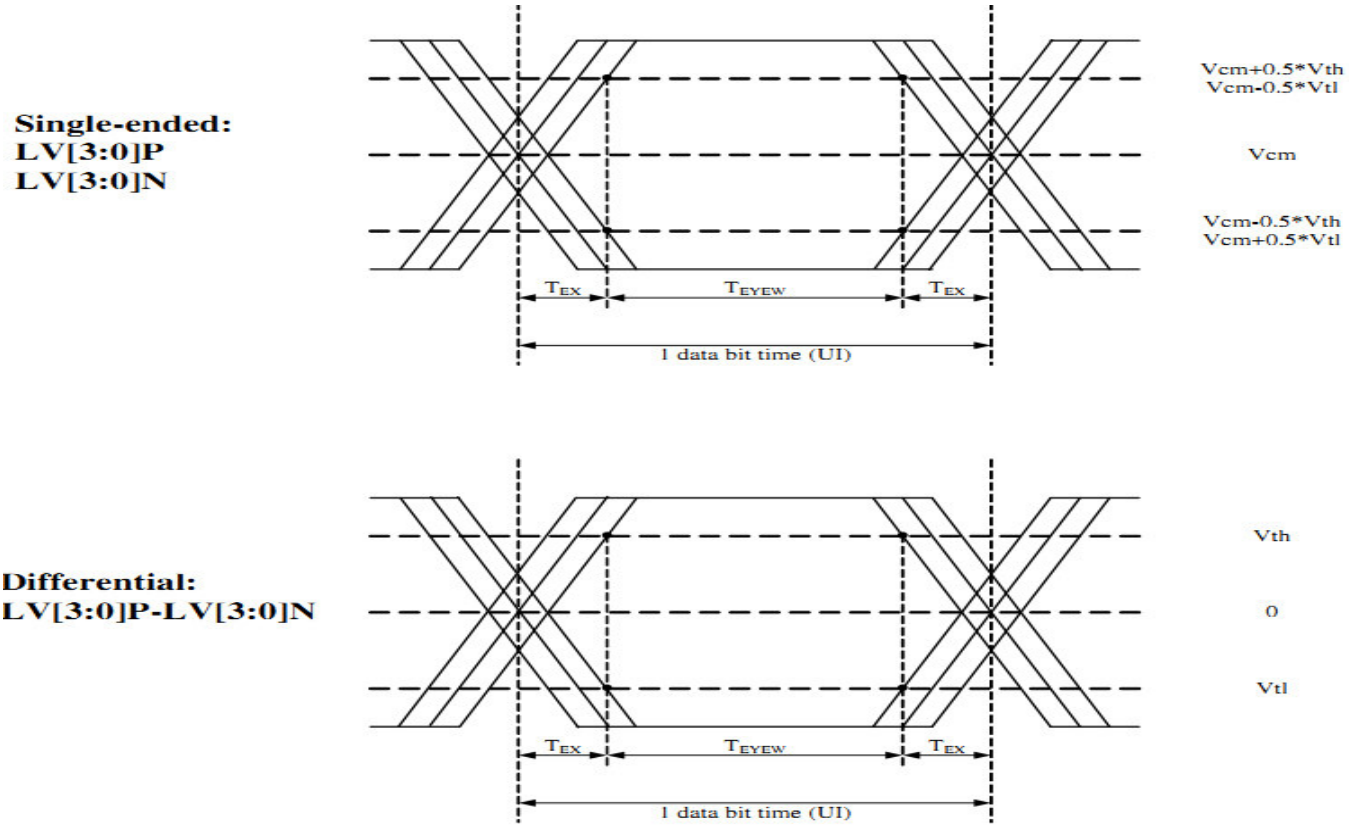


Figure 6.1.9 LVDS input eye diagram

7. Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle		θT	CR≧10	80	88		°	Note2
		θB		80	88			
		θL		80	88			
		θR		80	88			
Contrast Ratio		CR	Θ=0	700	1000		--	Note 1&3
Response Time		Ton+Toff	25℃		27	30	ms	Note4
Chromaticity	White	X	BL is on	0.266	0.316	0.366	--	Note 1&5
		Y		0.268	0.318	0.368		
	Red	X		0.604	0.654	0.704		
		Y		0.260	0.310	0.360		
	Green	X		0.249	0.299	0.349		
		Y		0.610	0.660	0.710		
	Blue	X		0.10	0.150	0.20		
		Y		0.024	0.074	0.124		
	NTSC			65	70		%	
Luminance	L		25℃	800	1000		cd/m^2	
Uniformity		U			70		%	Note 1&5
Gamma		Average	25℃		2.2		--	Note 1

Table 7.1 Optical Parameters

Test Conditions:

1. I_{VL}= **520** mA, and the ambient temperature is 25℃.
2. The test systems refer to Note1 and Note2.

Note1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical characteristics are measured at the center point of the LCD screen.

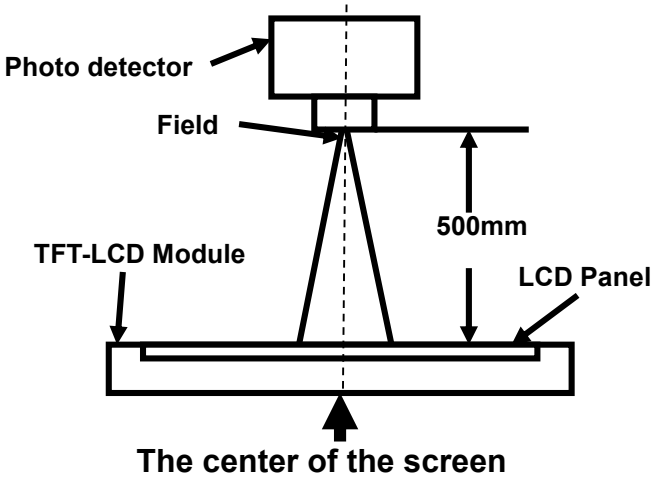


Fig1. Measurement Set Up

Note2: Definition of viewing angle range and measurement system. Viewing angle is measured at the center point of the LCD 。

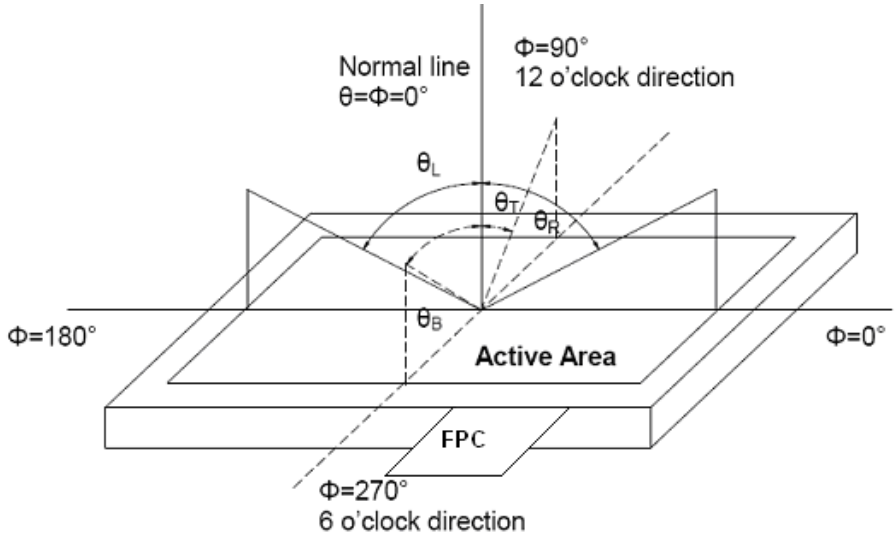


Fig2. Measurement viewing angle

Note3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

Note4: Definition of Response time

For TN LCM,the response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_r) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_f) is the time between photo detector output intensity changed from 10% to 90%.

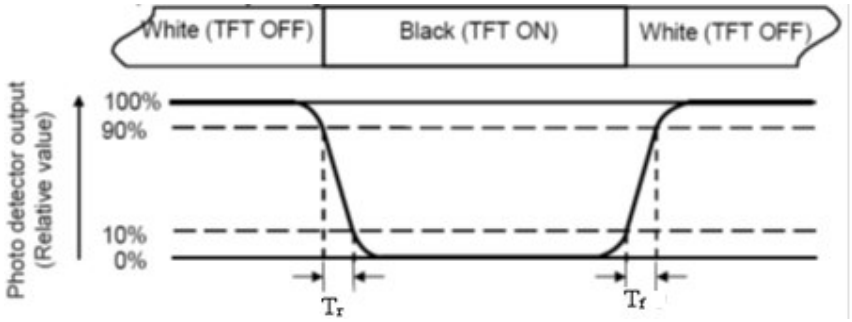


Fig3. Response Time Testing(TN)

For SFT LCM, the response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_r) is the time between photo detector output intensity changed from 10% to 90%. And fall time (T_f) is the time between photo detector output intensity changed from 90% to 10%.

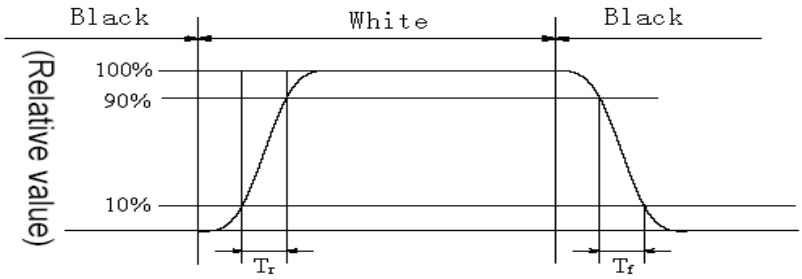


Fig4. Response Time Testing(SFT)

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig.5). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

Lmax: The measured Maximum luminance of all measurement position.

Lmin: The measured Minimum luminance of all measurement position.

L-------Active area length; W----- Active area width

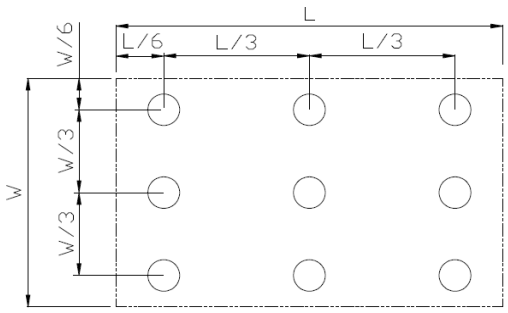


Fig5. Luminance Uniformity Measurement Locations(9 points)

Note7: Definition of Luminance:

Measure the luminance of white state at center point.

8. Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	+80℃，240H	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	-30℃，240H	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	+80℃，240H	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	-30℃，240H	IEC60068-2-1:2007 GB2423.1-2008
5	Storage at High Temperature and Humidity(non-operation)	+60℃，90%RH，240H	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-30℃/30min、80℃/30min 100cycles、1H/Cycle，high and low temperature should be exchanged in 5min	Start with cold temperature, End with high temperature, IEC60068-2-14:1984,GB2423.22-2002
7	Vibration Test (non-operational)	5~100HZ，19.60m/s2 1min/cycle 120times Per X\Y\Z	IEC60068-2-6:1982 GB/T2423.10—1995
8	Shock Test (non-operational)	539m/s2, 11ms 5times ±X、±Y、±Z	IEC60068-2-27:1987 GB/T2423.5—1995
9	ESD	C=150PF、R=330Ω Air：±15KV Connect：±8KV	IEC61000-4-2:2001 GB/T17626.2-2006

Table 8.1 RA test condition

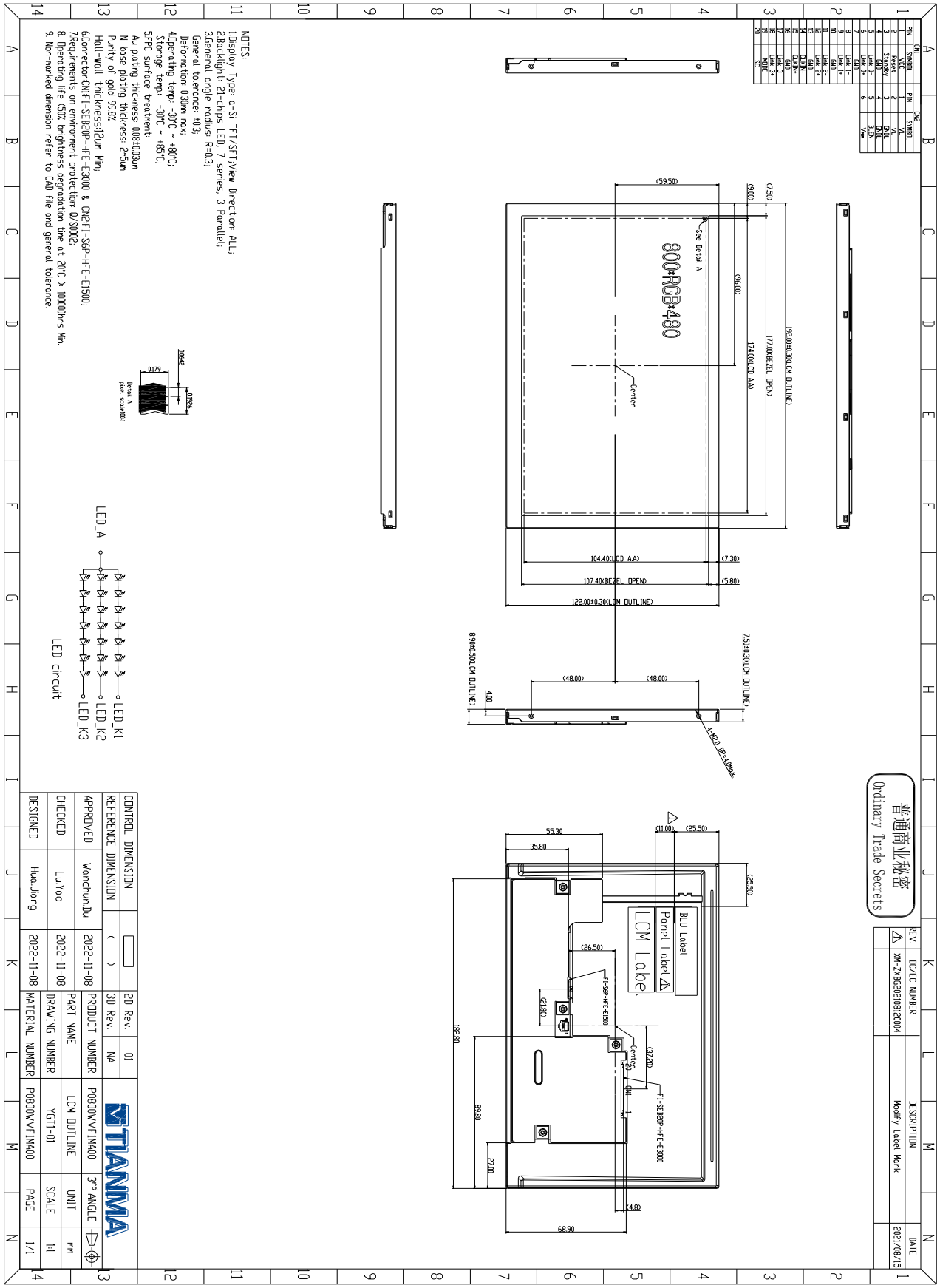
Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of sample.

Note3: Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

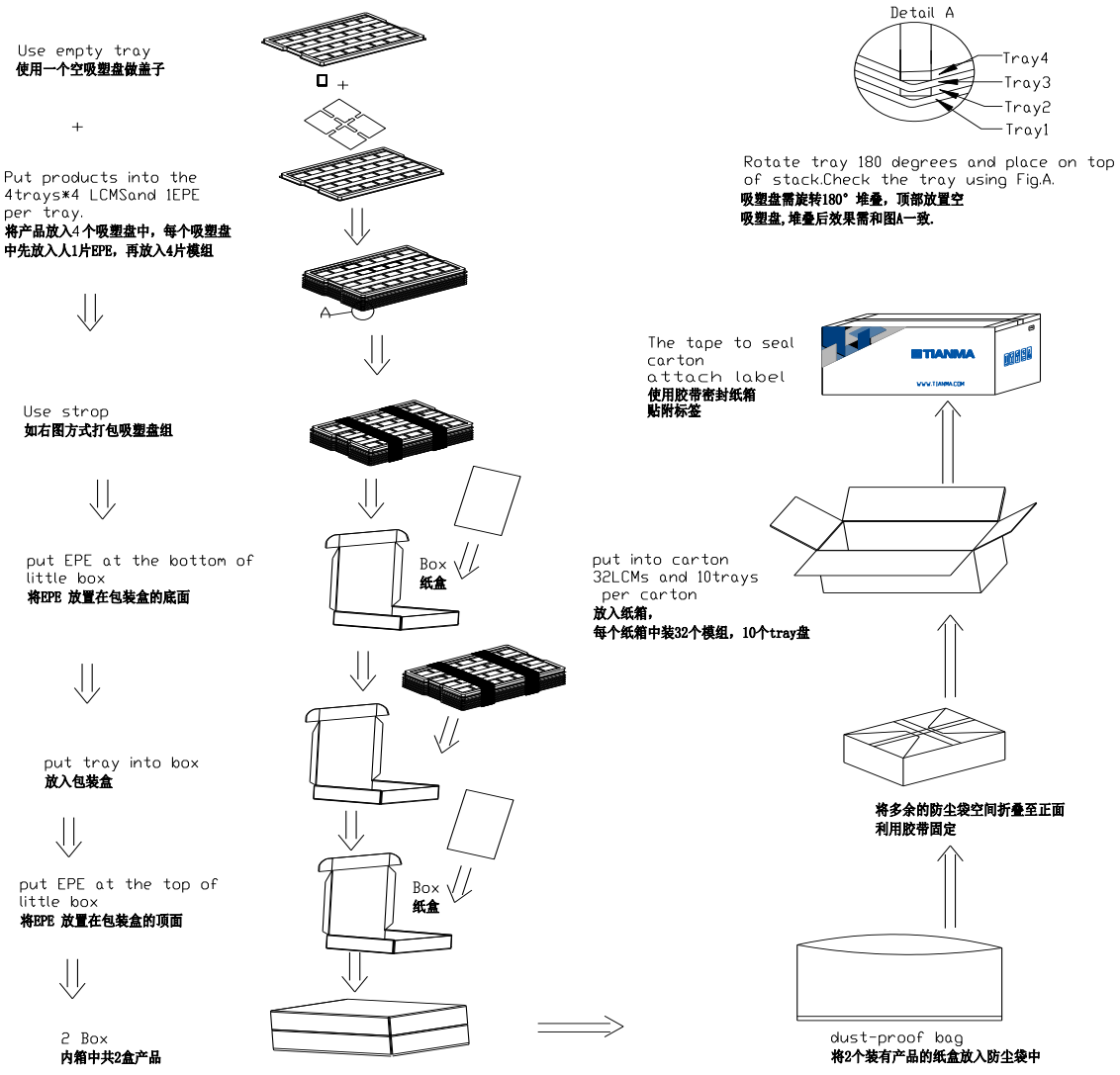
Note4: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

9. Mechanical Drawing



10. Packing Instruction

No	Item	Model (Material)	Dimensions(mm)	Unit Weight(Kg)	Quantity	Remark
1	LCM module	P0800WVF1MA00	192×122×7.5	0.235	32	7.52
2	Tray	PET	485×330×21.5	0.260	10	2.6
3	EPE	EPE	404.16×249.12×1	0.02	8	0.16
4	Dust-proof Bag	PE	700×545×0.05	0.021	1	0.021
5	Carton	Corrugated Paper	544×365×250	1.01	1	1.01
6	BOX	Corrugated Paper	520×345×74	0.38	2	0.76
7	EPE	EPE	485×330×5	0.016	4	0.064
8	Label		100×52	0.001	1	
9	Total weight	11.1 Kg±10%				



11. Precautions for Use of LCD Modules

11.1 Handling Precautions

(1) The display panel is made of glass. Do not subject it to mechanical shock by dropping it, etc.
(2) If the display panel is damaged and the liquid crystal fluid inside it leaks out be sure not to get any in your mouth. If the fluid comes into contact with your skin or clothes promptly wash it off using soap and water.
(3) Do not apply excessive force to the display surface or the bezel since this may cause the color tone to vary.
(4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle the polarizer carefully.
(5) If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is still not completely clear use a moist cloth with one of the following solvents:
   - Isopropyl alcohol
   - Ethyl alcohol

   Solvents other than those mentioned above may damage the polarizer. Specifically, do not use the following:
   - Water
   - Ketone
   - Aromatic solvents
(6) Do not disassemble the LCD Module.
(7) If powered off, do not apply the input signals.
(8) To prevent destruction of the module by static electricity, be careful to maintain an optimum work environment.
(9) Be sure to ground your body when handling the LCD Modules.
(10) Tools used for assembly, must be properly grounded.
(11) To reduce the amount of static electricity generated, do not conduct assembly or other work under very low humidity conditions.
(12) The LCD Module is covered with a film to protect the display surface, remove film slowly under the ionizer.

11.2 Storage precautions

(1) When storing the LCD modules avoid exposure to direct sunlight or to the light of fluorescent lamps.
(2) The LCD modules should be stored within the rated storage temperature range. The recommend condition is: Temperature: 0 ~ 35 ℃ at normal humidity.
(3) The LCD modules should be stored in a room without acid, alkali or other harmful gas.

11.3 Transportation Precautions

The LCD modules should not be dropped or subject to violent mechanical shock during transportation. Also they should avoid excessive pressure, water, high humidity and direct sunlight.

11.4 Screen saver Precautions

Not display the fixed pattern for a long time. Use a screen saver, if the fixed pattern is displayed on the screen

11.5 Safety Precautions

(1) When you waste damaged or unnecessary LCDs, it is recommended to crush LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned

(2) Be sure to turn off the power supply when inserting or disconnecting the LED backlight cable.
(3) LED driver should be designed to limit or stop its function when over current is detected on the LED.

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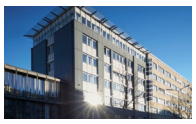

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