MODEL NO : P0700WVF1MA00

MODEL VERSION:

SPEC VERSION : 1.0

ISSUED DATE: 2020-09-29

■**Preliminary Specification**
□**Final Product Specification**

Customer :

Approved by	Notes

TIANMA Confirmed :

Prepared by	Checked by	Approved by
Xiaohui.zhou		

This technical specification is subjected to change without notice

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Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020-09-29	Preliminary release.	Xiaohui.zhou

1 General Specifications

Feature		Spec
Display Spec.	Size	7.0inch
	Resolution	800(RGB) x 480
	Technology Type	a-Si
	Pixel Configuration	R.G.B. Vertical Stripe
	Pixel pitch(mm)	0.1905 x0.1905
	Display Mode	Normally black（SFT）
	Surface Treatment	AG
	Viewing Direction	All
Mechanical Characteristics	LCM (W x H x D) (mm)	169.8x109.7 x10.87（Max）
	Active Area(mm)	152.40 (W) x 91.44 (H)
	With /Without TSP	Without
	Matching Connection Type	CN1:FI-S20S or compatible CN2:SHLP-06V-S-B
	LED Numbers	14pcs（2P7S）
	Weight (g)	TBD
Electrical Characteristics	Interface	1port LVDS, 6/8bit selectable
	Color Depth	16.7M
	Driver IC	Source IC: RM53350_3112 Gate IC: RM57750_3110

Note 1: Viewing direction for best image quality is different from TFT definition. There is a 180 degree shift.

Note 2: Requirements on Environmental Protection: Q/S0002

Note 3: LCM weight tolerance: ± 5%

2 Input/Output Terminals

TFT Connector CN1：Connector type:JAE FI-SEB20P-HFE
Matching Connector:FI-S20S or compatible
BLU Connector CN2：Connector type:SM06B-SHLS-TF(LF)(SN)
Matching Connector:SHLP-06V-S-B PIN

Pin No.	Symbol	I/O	Function	Remark
CN1				
1	VCC	P	Power supply(+3.3V)	
2	VCC	P	Power supply(+3.3V)	
3	GND	P	Ground	
4	GND	P	Ground	
5	Link0-	I	-LVDS differential data input(R0~R5,G0)	
6	Link0+	I	+LVDS differential data input(R0~R5,G0)	
7	GND	P	Ground	
8	Link1-	I	-LVDS differential data input(G1~G5,B0~B1)	
9	Link1+	I	+LVDS differential data input(G1~G5,B0~B1)	
10	GND	P	Ground	
11	Link2-	I	-LVDS differential data input(B2~B5,-,-,DE)	
12	Link2+	I	+LVDS differential data input(B2~B5,-,-,DE)	
13	GND	P	Ground	
14	CLKIN-	I	-LVDS differential Clock input	
15	CLKIN+	I	+LVDS differential Clock input	
16	GND	P	Ground	
17	Link3-	I	-LVDS differential data input(R6~R7,G6~G7,B6~B7)	
18	Link3+	I	+LVDS differential data input(R6~R7,G6~G7,B6~B7)	
19	Mode	I	MODE=“H” ,8bit MODE=“L” ,6bit	
20	SC	I	Scan direction control	*Note1*
CN2				
1	NC	-	No connection	
2	NC	-	No connection	
3	LED C1	-	LED Cathode1	
4	LED A1	-	LED Anode1	

5	LED A2	-	LED Anode2	
6	LED C2	-	LED Cathode2	

I---Input, O---Output, P--- Power/Ground

Note1：Scan direction is shown as below(PCB at down side):

3 Absolute Maximum Ratings

Ta = 25℃

Item	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VCC	-0.5	5.0	V	Note1
Input voltage	V_{IN}	-0.5	5.0	V	
Operating Temperature	Top	-30	80	℃	
Storage Temperature	Tst	-40	90	℃	
Relative Humidity Note2	RH	--	≤95	%	Ta≤40℃
		--	≤85	%	40℃＜Ta≤50℃
		--	≤55	%	50℃＜Ta≤60℃
		--	≤36	%	60℃＜Ta≤70℃
		--	≤24	%	70℃＜Ta≤80℃
Absolute Humidity	AH	--	≤70	g/m³	Ta＞70℃

Table 3 Absolute Maximum Ratings

Note1: VIN represents Link 0-/+,Link 1-/+,Link 2-/+,Link 3-/+,CLKIN-/+,Mode,SC.
Note2: Ta means the ambient temperature.
It is necessary to limit the relative humidity to the specified temperature range. Condensation on the module is not allowed.

4 Electrical Characteristics

4.1 Driving TFT LCD Panel

Ta = 25℃; VCC=3.3V

Item		Symbol	Min	Typ	Max	Unit	Remark
Digital Supply Voltage		VCC	3.0	3.3	3.6	V	
Power supply ripple		Vp-p	-	-	100	mV	
Supply Current		IVCC	-	TBD	-	mA	
Power consumption		P_{TFT}	-	TBD	-	mW	Note1
Input Voltage	Low level	V_{IL}	0		0.3*VCC	V	
	High level	V_{IH}	0.7*VCC		VCC	V	Note2
Differential input voltage		|Vid|	200		600	mV	
Differential input common voltage		Vcom	|Vid|/2		VDD-1.2-|Vid|/2	V	
Differential input threshold voltage	Low level	VTL	-100	-	-	mV	
	High level	VTH	-	-	100		
Inrush current		Inrush			1.5	A	Note3

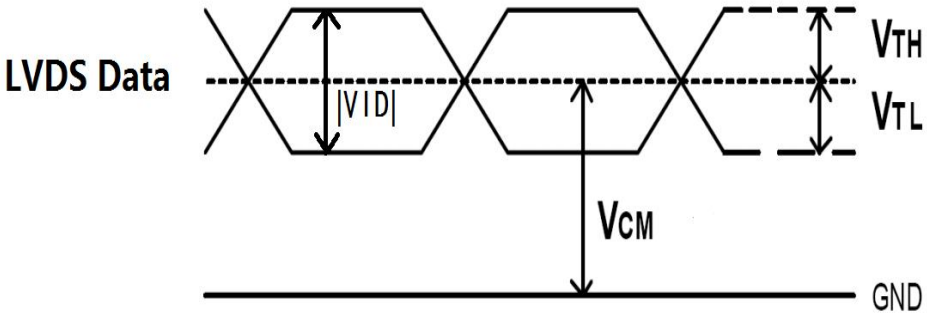


Figure4.1 LVDS DC characteristics

Note1: To test the current dissipation, using the “white” testing pattern.
Note2: For setting “SC” and “MODE”.
Note3: Inrush current definition

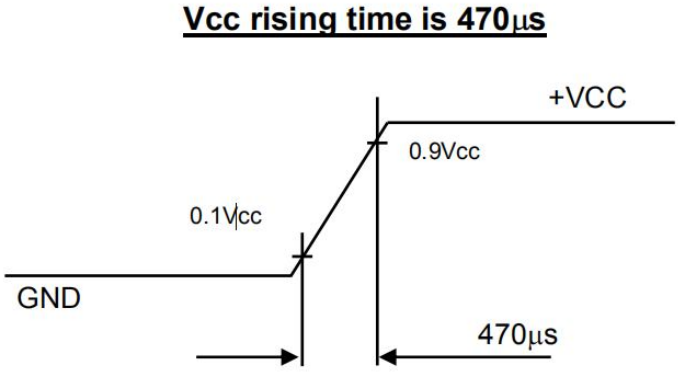
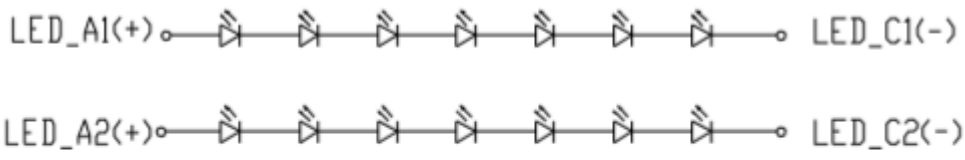


Figure4.2 Inrush current test condition

4.2 TFT Driving Backlight

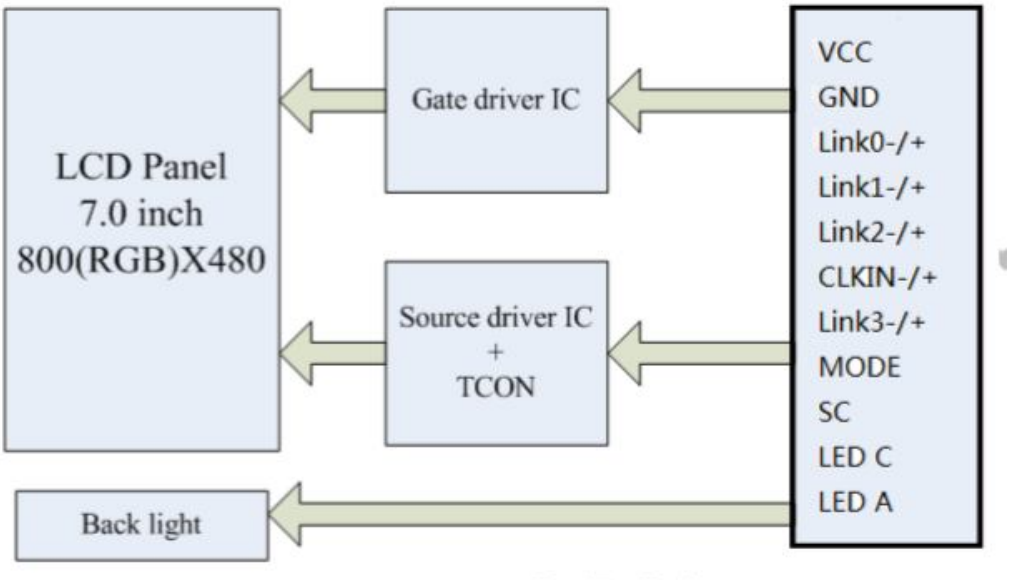
Item	Symbol	Min	Typ	Max	Unit	Note
Forward Current	I_F		110		mA	I_F/LED
Forward Current Voltage	V_F		21		V	
Power Consumption	P_Total		4.62		W	
Operating Life Time	-	80000	100000		h	



Backlight Circuit Diagram
2*7=14LEDS; If=110mA/LED

Note1: The LED driving condition is defined for total LED module.
Note2: Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.
Note3: 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% initial brightness. Typical operating life time is estimated data.
Note4: The LED driving condition is defined for each LED module.

4.3 Module Block diagram



5 Timing Chart

5.1 TFT-LCD Input Timing

VCC=3.3V, GND=0V, Ta=25℃

Parameter	Symbol	Min	Typ	Max	Unit	Remark
CLK frequency	$1/t_{CLK}$	25.2	27.2	30.5	MHz	
Horizontal blanking time	t_{HBT}	24	60	120	t_{CLK}	$t_{HBP} + t_{HFP}$
Horizontal back porch	t_{HBP}	5	16	101	t_{CLK}	
Horizontal display area	t_{HD}	-	800	-	t_{CLK}	
Horizontal front porch	t_{HFP}	19	44	115	t_{CLK}	
Horizontal period	t_H	856	860	920	t_{CLK}	
Horizontal pulse width	t_{HPW}	1	2	100	t_{CLK}	
Vertical blanking time	t_{VBT}	10	48	72	t_H	$t_{VBP} + t_{VFP}$
Vertical back porch	t_{VBP}	5	5	67	t_H	
Vertical display area	t_{VD}	-	480	-	t_H	
Vertical front porch	t_{VFP}	5	43	67	t_H	
Vertical period	t_V	490	528	552	t_H	
Vertical pulse width	t_{VPW}	1	2	66	t_H	
Frame Rate	F	-	60	-	Hz	

Table 5.1 Timing table

5.2 Timing Diagram

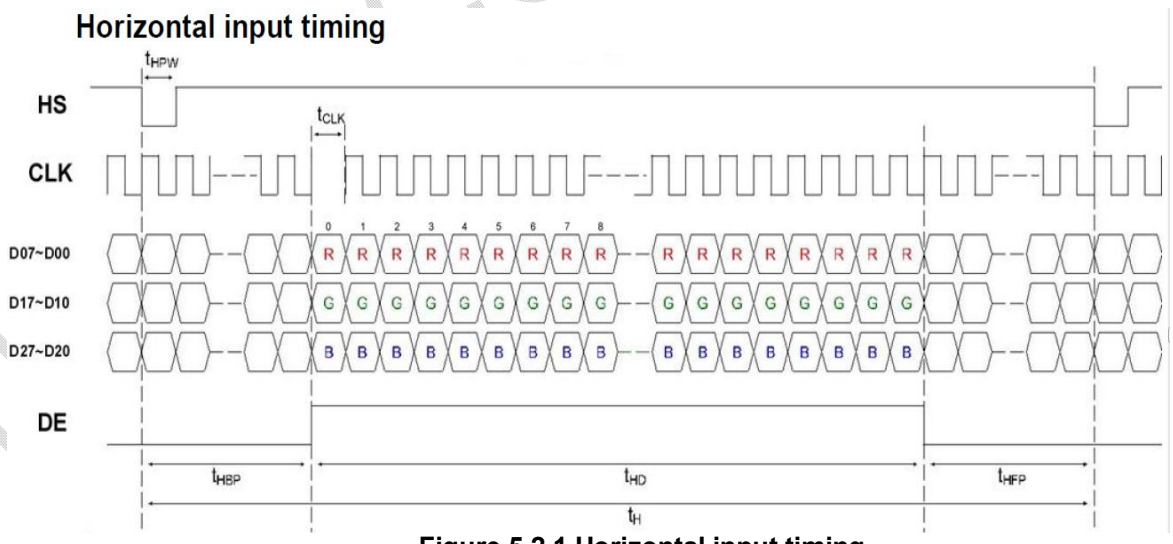


Figure 5.2.1 Horizontal input timing

Vertical input timing

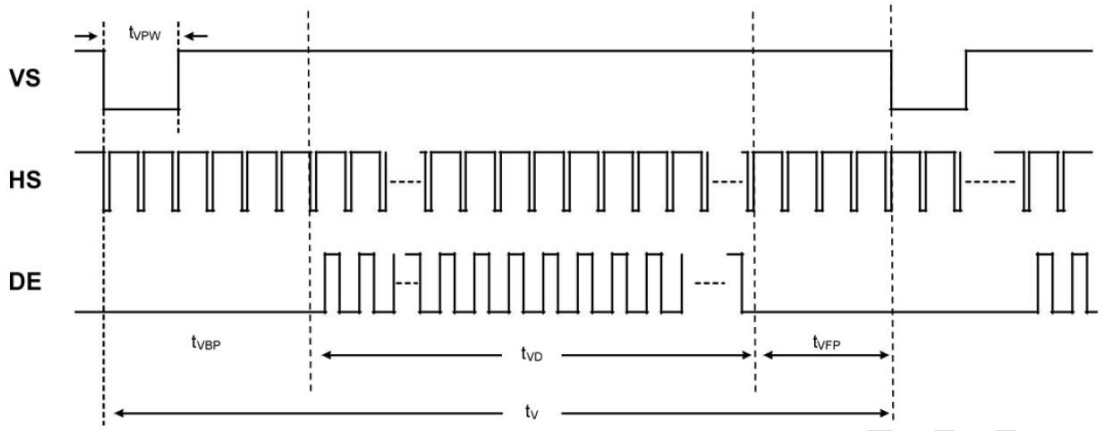
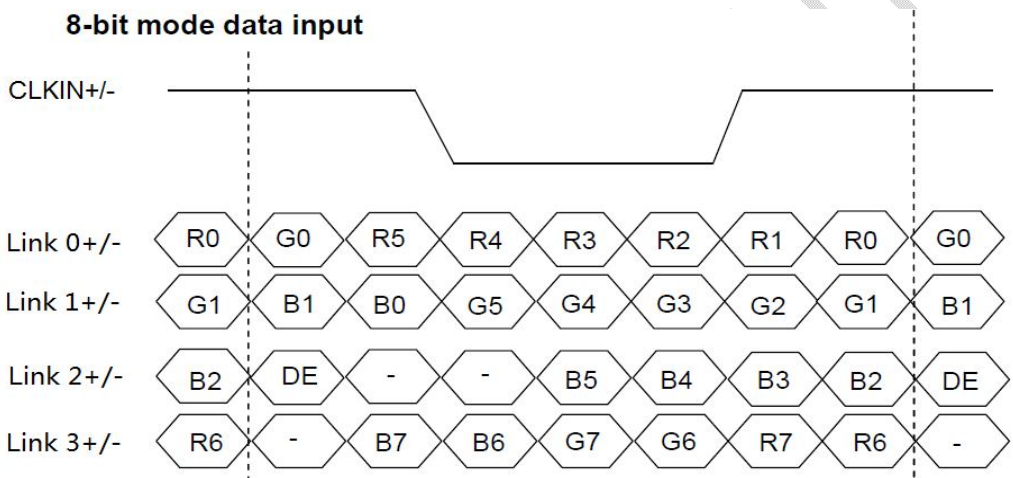


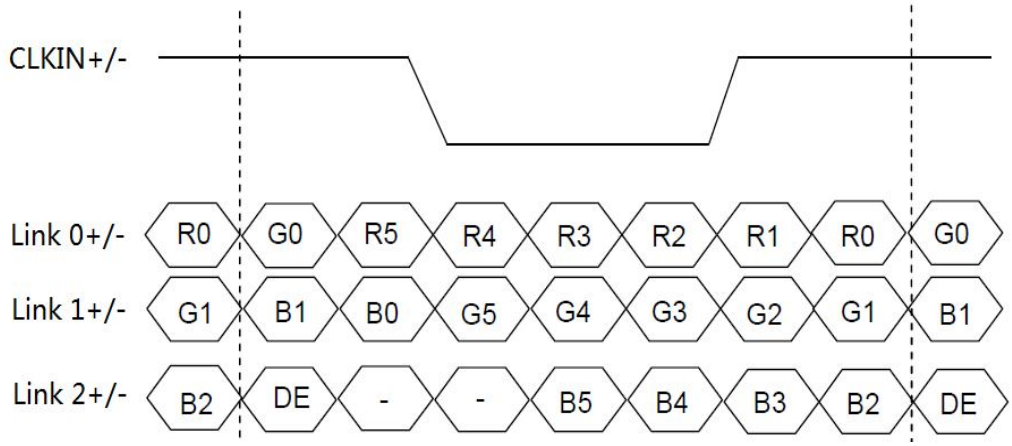
Figure 5.2.2 Vertical input timing

5.3 LVDS data input format

8-bit mode data input



6-bit mode data input



5.4 POWER ON/OFF SEQUENCE

Item	Symbol	Min	Typ	Max	Unit	Remark
VCC on to VCC stable	TP1	1	-	20	ms	
VCC stable to signal on	TP2	1	-	-	ms	
Signal on to LED on	TP3	200	-	-	ms	
VCC off time	TP4	1	-	10	ms	
VCC off to next VCC on	TP5	500	-	-	ms	
Signal off before VCC off	TP6	1	-		ms	
LED off before signal off	TP7	200	-	-	ms	

Table 5.4 Power on/off sequence

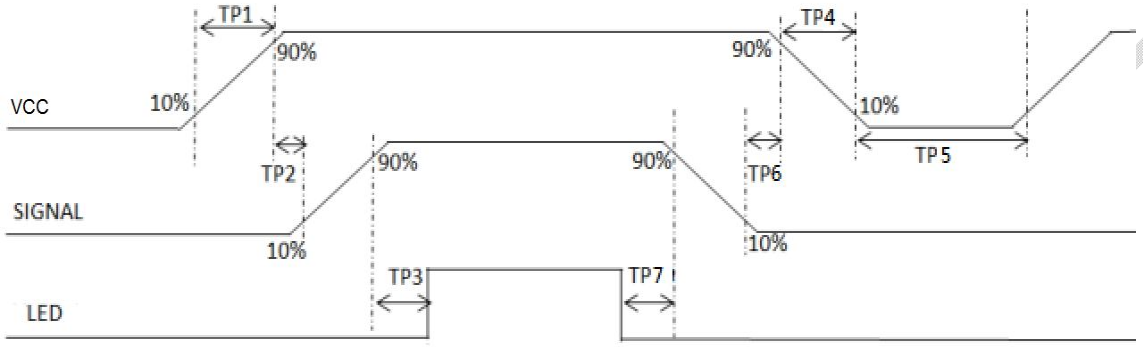


Figure 5.4 Power on/off sequence

6 Optical Characteristics

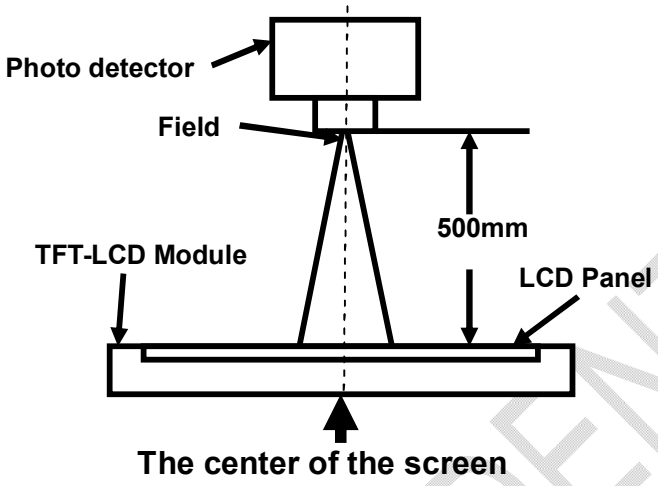
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	75	85	-	Degree	Note2,3
		θB		75	85	-		
		θL		75	85	-		
		θR		75	85	-		
Contrast Ratio		CR	θ=0°	800	1000			Note 3
Response Time		T_{ON}	25℃		25	35	ms	Note 4
		T_{OFF}						
Chromaticity	**White**	x	Backlight is on		TBD			Note 1,5
		y			TBD			
	Red	x			TBD			Note 1,5
		y			TBD			
	Green	x			TBD			Note 1,5
		y			TBD			
	Blue	x			TBD			Note 1,5
		y			TBD			
Uniformity		U		75	80		%	Note 6
NTSC				65	70		%	Note 5
Luminance		L		1200	1500		cd/m^2	Note 7

Test Conditions:

1. I_F= **XX** mA, and the ambient temperature is 25℃.
2. The test systems refer to Note 1 and Note 2.

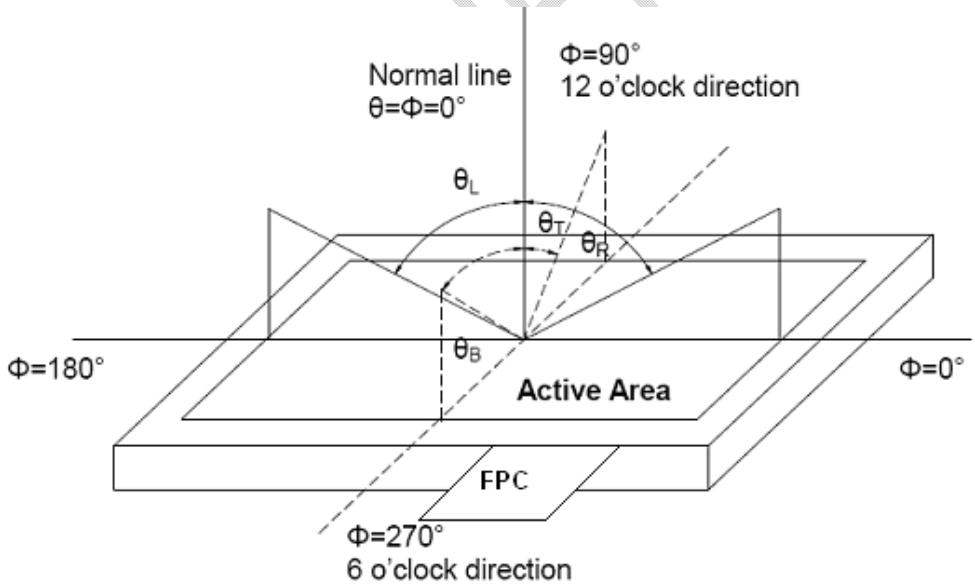
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD 。



Note 3: Definition of contrast ratio

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

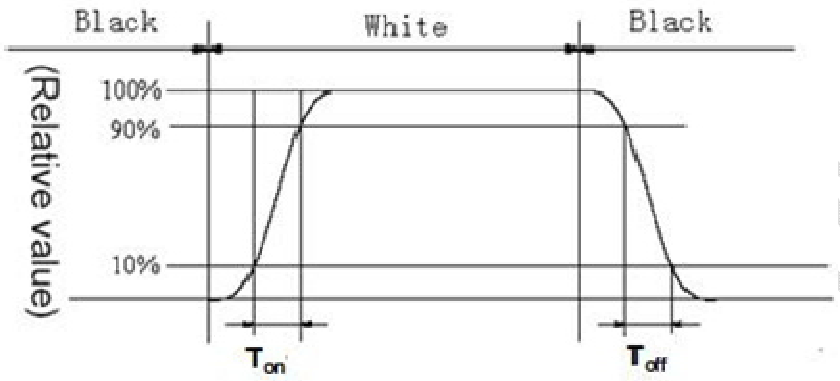
"White state ": The state is that the LCD should drive by Vwhite.

"Black state": The state is that the LCD should drive by Vblack.

Vwhite: To be determined Vblack: To be determined.

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 10% to 90%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 90% to 10%.



Note 5: Definition of color chromaticity (CIE1931)

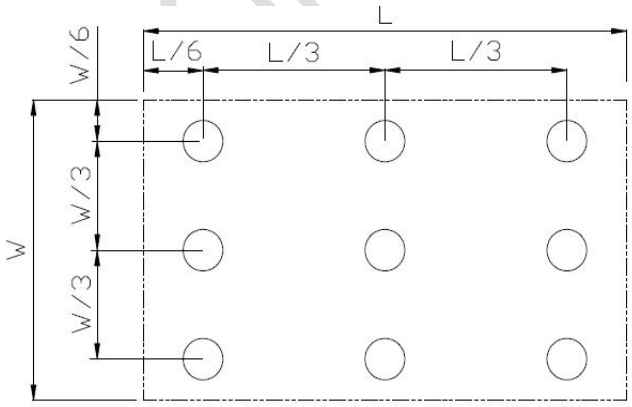
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

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



Lmax: The measured Maximum luminance of all measurement position.

Lmin: The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

7 Environmental / Reliability Test

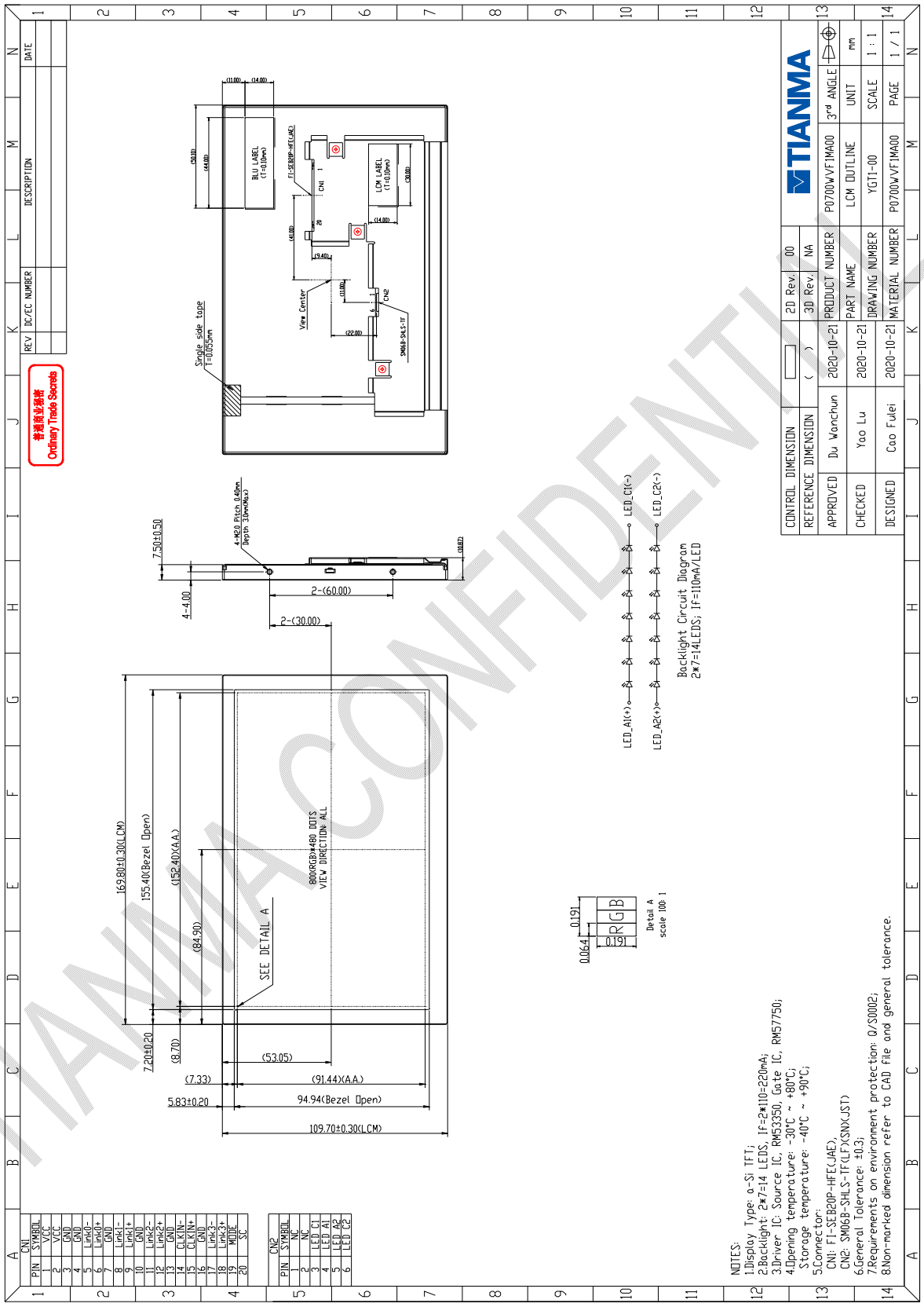
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ta = +80℃ , 500 hours	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	Ta = -30℃ , 500 hours	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	Ta = +90℃ , 500 hours	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	Ta = -40℃ , 500 hours	IEC60068-2-1:2007 GB2423.1-2008
5	Storage at High Temperature and Humidity	Ta = +60℃, 90% RH max,240hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-30℃ 30 min~+85℃ 30 min, Change time:5min, 100 Cycle Start with cold temperature, End with high temperature,	IEC60068-2-14:1984, GB2423.22-2002
7	ESD	C=150pF,R=330Ω,5point/panel Air:±8Kv,5times; Contact:±4Kv,5times (Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration Test (non-operation)	1G Waveform: sinusoidal Frequency range: 5~500Hz Frequency sweep rate: 0.5 octave/mim Duration: one sweep from 5 to 500Hz in each of three mutually perpendicular axis(each x,y,z axis:1hour,total 3hrs)	IEC60068-2-6:2007 GB/T 2423.10-2019
9	Shock Test (non-operation)	Half Sine Wave 60G ,2ms,±X,±Y,±Z 2times for each direction	IEC60068-2-27:2008 GB/T 2423.5-2019
10	Package Drop Test	Weight≤10Kg , Height:80cm; Weight > 10Kg, , Height:60cm; 1corner,3edges,6surfaces	IEC60068-2-32:1990 GB/T2423.8—1995

Note1: Ta is the ambient temperature of sample.

Note2: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note3: 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.

8 Mechanical Drawing



9 Packing Drawing

(如果客户对标签或 Label 有特殊要求，请注明)

10 Precautions for Use of LCD Modules

10.1 Handling Precautions

10.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5 If the display surface is contaMinated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

10.1.6 Do not attempt to disassemble the LCD Module.

10.1.7 If the logic circuit power is off, do not apply the input signals.

10.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.

10.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2 Storage precautions

10.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%

10.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

10.3.1 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.