SPECIFICATION

[◉] Preliminary Specification
[ ] Final Specification

Description **5.7” 640 x RGB x 480 TFT-LCD Module**
Part Number **P0570VGF1MA00**

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REVISION HISTORY

Rev	Date	Page	Revision Items	Editor
1.0	2025/7/8	-	Target Specification Release	Tong Zhang
1.1	2025/7/9	6,7	Update Backlight Driving Information	Tong Zhang
		16	Update Packing Instruction	
1.2	2025/7/23	5	Update Operating Temperature in Table 4.1	Tong Zhang
		14	Update High Temperature Operation	
		-	Preliminary Specification Release	

CONTENTS

1. Summary

1.1 General Description

This is a 5.7 inch a-Si TFT-LCD module with Normal- Black technology. It is composed of a TFT-LCD panel, a driver circuit, a PCB, and a LED backlight unit.

1.2 Features

- Ultra-wide viewing angle
- High luminance
- Long LED life time
- Wide temperature range
- Interface: RGB
- Surface treatment: AG
- Acquisition product for UL62368-1/CSA C22.2 No.62368-1-03 (File number: E333987)
- 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	5.7 inch	
	Resolution	640 (RGB) x 480	
	Pixel Pitch	0.18 x 0.18	mm
	TFT Active Area	115.2 x 86.4	mm
	Technology Type	a-Si	
	Pixel Configuration	R.G.B Vertical Stripe	
	Display Mode	SFT, Normally Black	
	Surface Treatment	AG	
	Viewing Direction	ALL	
	Polarizer pencil-hardness	3 H	
Mechanical Characteristics	LCM (W x H x D)	144.0 x 104.6 x 12.3	mm
	Open Bezel	116.2 x 87.4	mm
	Weight	TBD	g
Optical Characteristics	Luminance	1000	cd/m^2
	Contrast Ratio	1000 : 1	
	NTSC	63	%
	Viewing Angle	88/88/88/88	degree
Electrical Characteristics	Interface	RGB	
	Color Depth	262K	color
	Power Consumption	TBD	mW

Table 2.1 General TFT Specifications

3. Input / Output Terminals

3.1 CN1 Pin assignment (LCD Interface)

Connector Information	
LCD Module connector	HIROSE FH12-33S-0.5SH(55)

Table 3.1.1 LCD Connector information

No	Symbol	I / O	Description	Comment
1	GND	P	Ground	
2	CLK	I	Clock signal	
3	NC	N	No connection	
4	NC	N	No connection	
5	GND	P	Ground	Note 2
6	R0	I	Red Data input	
7	R1	I	Red Data input	
8	R2	I	Red Data input	
9	R3	I	Red Data input	
10	R4	I	Red Data input	
11	R5	I	Red Data input	
12	GND	P	Ground	Note 2
13	G0	I	Green Data input	
14	G1	I	Green Data input	
15	G2	I	Green Data input	
16	G3	I	Green Data input	
17	G4	I	Green Data input	
18	G5	I	Green Data input	
19	GND	P	Ground	Note 2
20	B0	I	Blue Data input	
21	B1	I	Blue Data input	
22	B2	I	Blue Data input	
23	B3	I	Blue Data input	
24	B4	I	Blue Data input	
25	B5	I	Blue Data input	
26	GND	P	Ground	Note 2
27	DE	I	Data input enable. Active High to enable the data input	Note 1
28	VCC	P	Power supply (+3.3V)	

29	VCC	P	Power supply (+3.3V)	
30	R/L	I/O	Horizontal scan Normal: L or NC, Reverse: H	Note 3
31	U/D	I/O	Vertical scan Normal: H or NC, Reverse: L	Note 3
32	NC	N	No connection	
33	GND	P	Ground	Note 2

Table 3.1.2 Pin Assignment for LCD Interface

Note 1: I/O definition: I---Input, O---Output, P---Power/Ground, N-- No connection
Note 2: All of the GND pins should be connected to the system ground.
Note 3: Scanning Direction:
The following figures are seen from a front view.

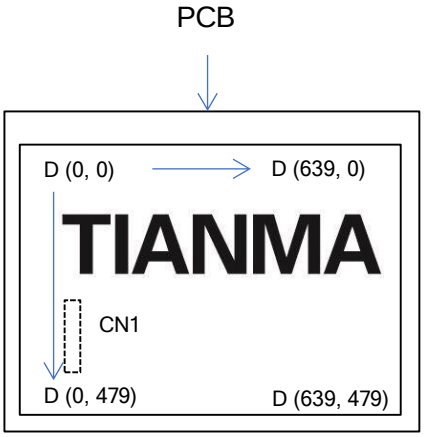


Figure 3.1.1. Normal scan (R/L: Low or NC; U/D: High or NC)

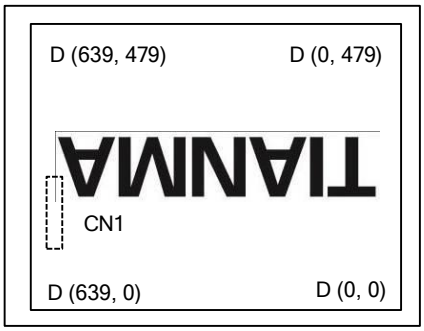


Figure 3.1.2. Reverse scan (R/L: High; U/D: LOW)

3.2 CN2 Pin assignment (Backlight)

Connector Information	
Backlight connector	SM06B-SRKS-G-TB

Table 3.2.1 Backlight Connector information

No	Symbol	I / O	Description	Comment
1	VDD	P	Backlight Power supply（12V）	
2	VDD	P	Backlight Power supply（12V）	
3	GND	P	Ground	Note 2
4	GND	P	Ground	Note 2
5	PWM	I	Backlight dimming control	
6	EN	I	Backlight on/off control	

Table 3.2.2 Pin Assignment for Backlight Interface

Note 1: I/O definition: I---Input, O---Output, P---Power/Ground, N---No connection
Note 2: All of the GND pins should be connected to the system ground.

4. Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit	Remark
Power Voltage	VDD	-0.3	3.96	V	Note 1
Operating Temperature	Top	-30	80	℃	
Storage Temperature	Tst	-30	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 4.1 Absolute Maximum Ratings

Note 1: Input voltage include all input data.
Note 2: 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.
Note 3: The absolute maximum rating values of this product are not allowed to be exceeded at any times. A module should be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme condition, the module may be permanently destroyed.

5. Electrical Characteristics

5.1 DC Characteristics for Panel Driving

Item		Symbol	MIN	TYP	MAX	Unit	Remark
Supply Voltage		VCC	3.0	3.3	3.6	V	
Input Signal Voltage	Low Level	VIL	0	--	0.3 × VCC	V	
	High Level	VIH	0.7 × VCC	--	VCC	V	
Output Signal Voltage	Low Level	VOL	0	--	0+0.4	V	
	High Level	VOH	0.7 × VCC	--	VCC	V	
Power Consumption	60Hz	P	--	TBD	--	mW	White pattern

Table 5.1.1 Operating Voltages

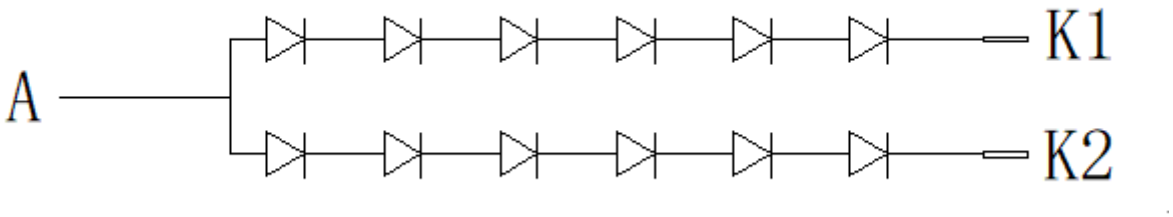
Note 1: Indicated the subsequent version may be updated.

5.2 DC Characteristics for Backlight Driving

Item		Symbol	Min	Typ	Max	Unit	Remark
Backlight power supply voltage		VLED	10.8	12	13.2	V	
Backlight power supply current		I_LED	-	TBD	-	mA	
Backlight power consumption		P_LED	-	TBD	-	mW	
VL inrush current		Inrush	-	TBD	-	A	
Permissible ripple voltage		VRPD	-	TBD	-	V	
Input voltage for PWM signal	High level	-	2.0	-	5.3	V	
	Low level	-	0	-	0.8	V	
Input voltage for EN	High level	-	2.0	-	5.3	V	
	Low level	-	0	-	0.8	V	
PWM frequency		Fpwm	200	-	10k	HZ	
PWM duty		D	0.2	-	100	%	
LED life time		--	--	70000	--	hrs	Note 2

Table 5.2.1 LED Backlight Characteristics

Note 1: The figure below shows the connection of backlight LED.



Note 2: Optical performance should be evaluated at Ta=25℃ only.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition, the life time of LED will be reduced.
Note 4: 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

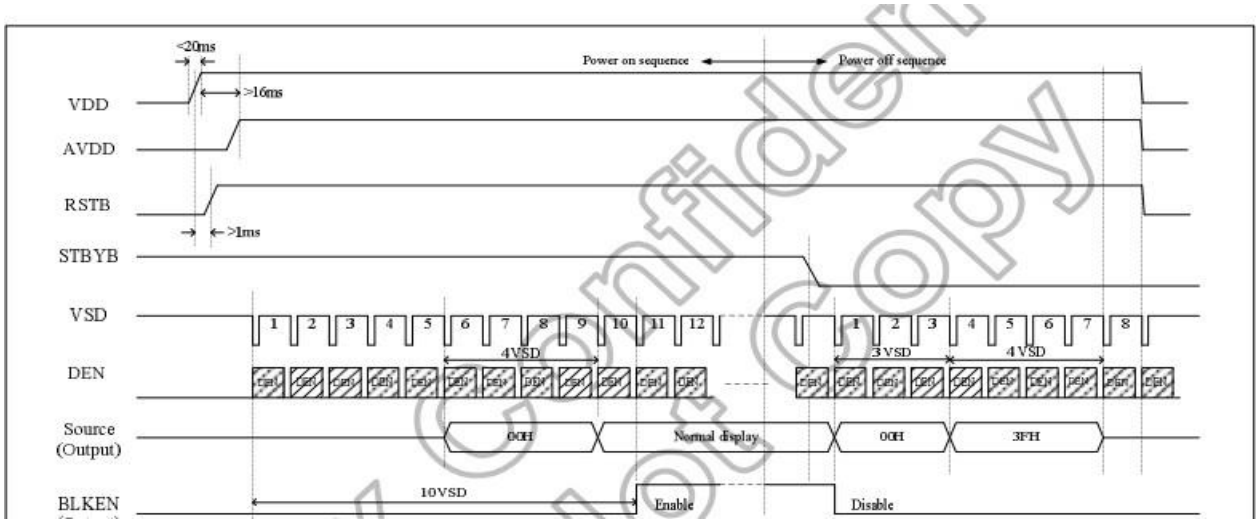


Figure 5.3.1 Power on/off sequence

Note 1: The low level of these signals and analog powers are GND level.
Note 2: All of the power and signals should be kept at GND level before power on. If there are residual voltages on them, the LCD might not work properly.
Note 3: The power on/off sequence is the first version. It will be updated when the design is fixed.
Note 4: BL is the voltage applied to backlight. Keep it turned off until the display has stabilized.

5.4 LCD Module Block Diagram

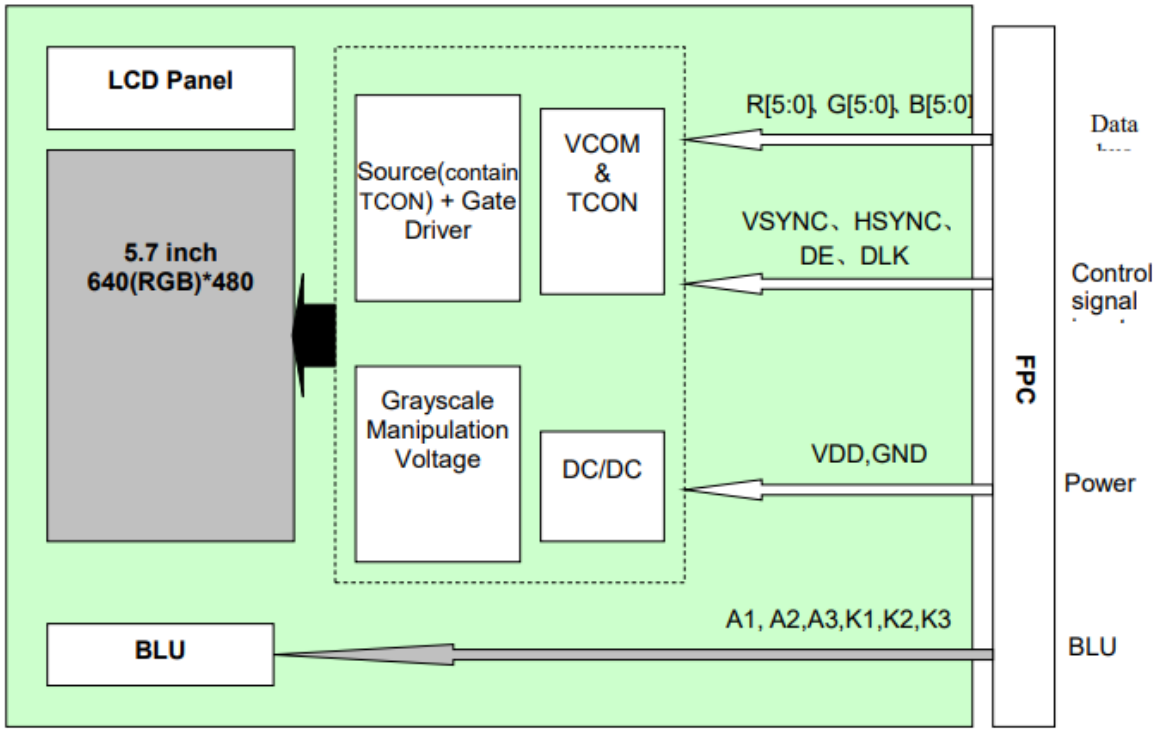
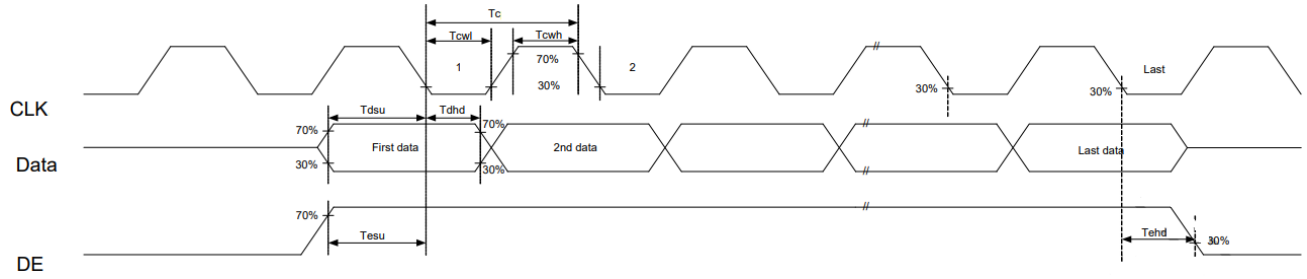


Figure 5.4.1 LCD Module Block Diagram

6. Timing Characteristics

6.1 Input Data Timing (DE Mode)



Parameter			Symbol	Min.	Typ.	Max.	Unit	Remarks
CLK	Frequency		1/tc	23.26	24	37.05	MHz	-
	Duty ratio		tcwh	0.4	0.5	0.6	-	-
DATA	CLK-DATA	Setup time	tdsu	8	-	-	ns	-
		Hold time	tdhd	8	-	-	ns	
DE	Horizontal	Cycle	th	25.80	31.746	32.115	μs	31.5 kHz (typ.)
				747	760	956	CLK	
		Display period	thd	640			CLK	-
	Vertical (One frame)	Cycle	tv	16.667			ms	60.0 Hz (typ.)
				519	525	646	H	
		Display period	tvd	480			H	
	CLK-DE	Setup time	tesu	8	-	-	ns	-
		Hold time	tehd	8	-	-	ns	

Table 6.1 AC characteristics Timing Characteristics

Note 1: Definition of parameters is as follows. tc= 1CLK, th= 1H

Note 2: Vertical cycle (tv) should be specified in integral multiple of Horizontal cycle (th).

6.2 Data Input format (DE Mode)

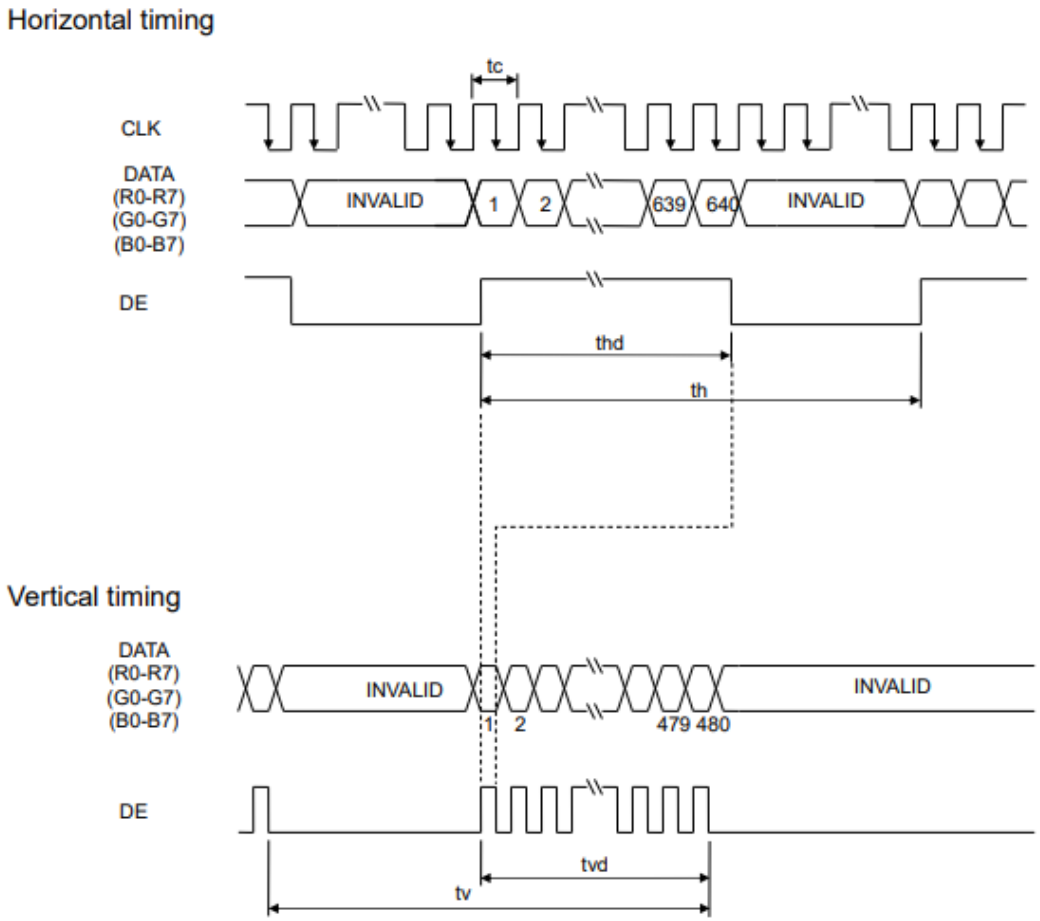


Table 6.2 Data Input Timing Parameter under DE Mode

6.3 DE Mode Timing Diagram

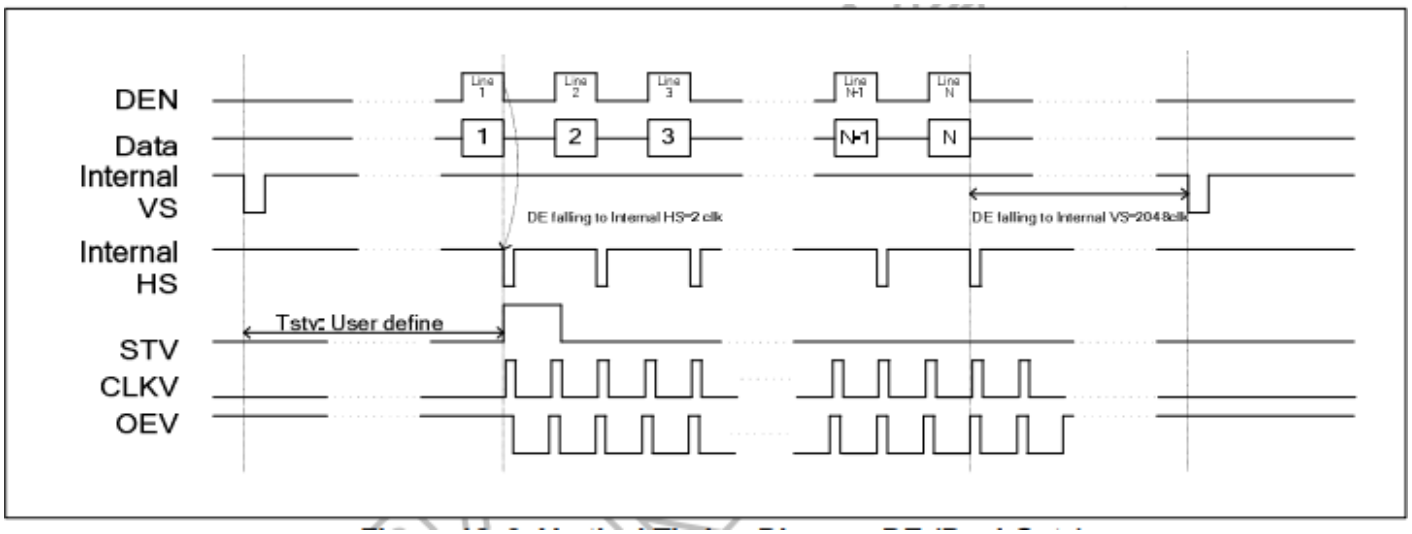


Figure 6.3 Data Input Timing Diagram under DE Mode

7. Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	80	88		degree	Note2,3
		θB		80	88			
		θL		80	88			
		θR		80	88			
Contrast Ratio		CR	θ=0°	800	1000			Note 3
Response Time		TON	25℃		35	45	ms	Note 4
		TOFF						
Chromaticity	White	x	Backlight is on		(0.315)			Note 1,5
		y			(0.334)			
	Red	x			(0.626)			Note 1,5
		y			(0.327)			
	Green	x			(0.325)			Note 1,5
		y			(0.617)			
	Blue	x			(0.158)			Note 1,5
		y			(0.087)			
Uniformity		U		70	80		%	Note 6
NTSC		-		58	63		%	Note 5
Luminance		L		800	1000		cd/m^2	Note 7

Table 7.1 Optical Parameters

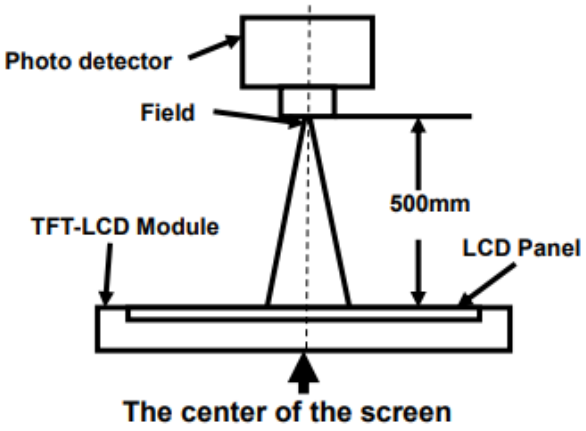
Test Conditions:

1. I_F= 120 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 characteristics are measured at the center point of the LCD screen.

Figure 1. Measurement Set Up



Note 2: Definition of viewing angle range and measurement system. Viewing angle is measured at the center point of the LCD.

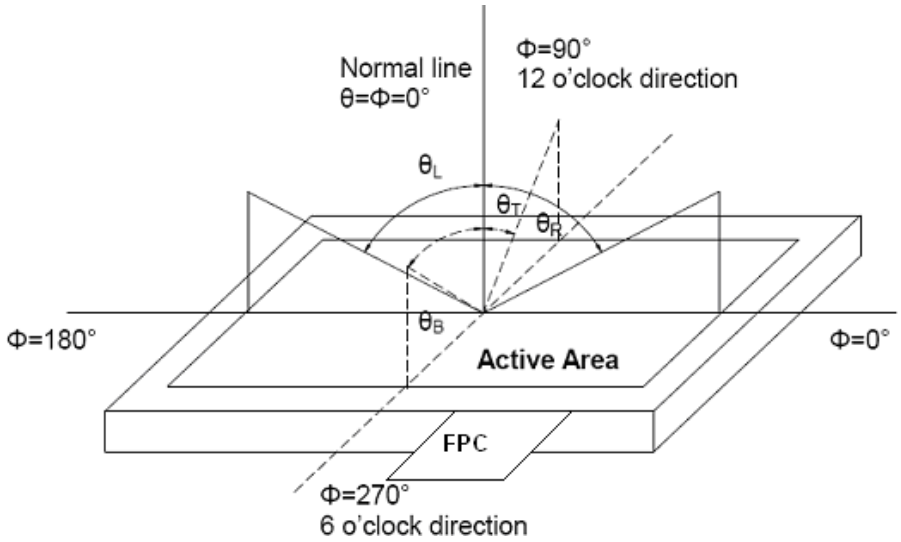


Figure 2. Measurement viewing angle

Note 3: Definition of contrast ratio

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

Note 4: Definition of Response time

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%.

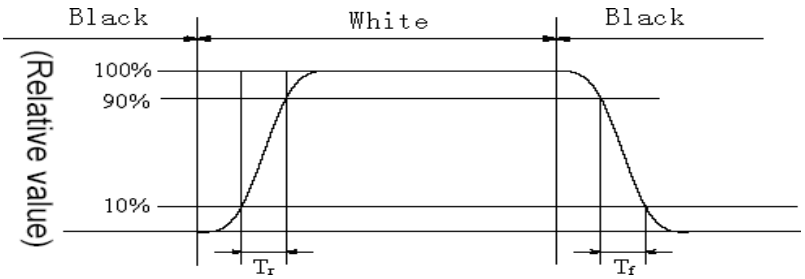


Figure 3. Response Time Testing (SFT)

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.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

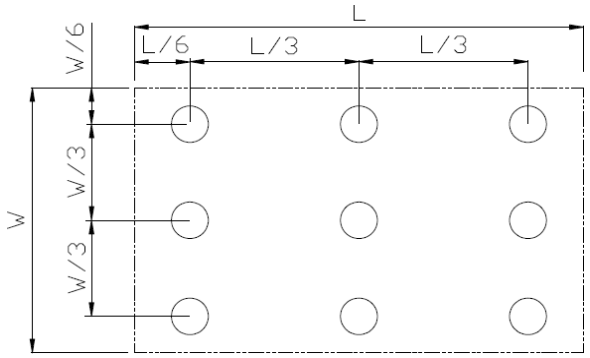


Figure 4. Luminance Uniformity Measurement Locations (9 points)

Note 7: Definition of Luminance:

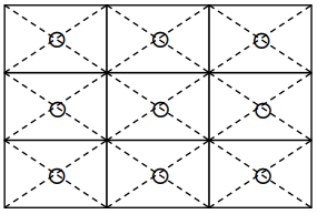
Measure the luminance of white state at center point.

8. Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ta = + 80℃ · 240H	Note 1 IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	Ta = - 30℃ · 240H	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	Ta = + 90℃ · 240H	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	Ta = - 30℃ · 240H	IEC60068-2-1:2007 GB2423.1-2008
5	Operation at High Temperature and Humidity(operation)	Ta = +60℃ · 90%RH · 240H	IEC60068-2-78 :2001 GB/T 2423.3-2016
6	Thermal Shock (non-operation)	-30℃ 30minutes · 80℃ 30minutes, 100cycles, 1hour/cycle Temperature transition time is within 5 minutes.	Start with cold temperature, End with high temperature, IEC60068-2-14:1984, GB/T 2423.22-2012
7	ESD	C=150pF，R=330Ω, 9 point/panel Air：±15kv，5times； Contact：±8kv，5times； （Environment：15℃~35℃， 30%~60%，86Kpa~106Kpa）	Note 2 IEC61000-4-2:2001 GB/T 17626.2-2018
8	Vibration (Non-operation)	5 ~ 200 Hz, 19.6 m/s2 1minute/cycle x,y,z 120 times each directions	IEC600682-6:1982 GB/T 2423.10-2019
9	Shock (Non-operation)	294 m/s2, 11 ms ±X, ±Y, ±Z directions 3 times each direction	IEC600682-6:1982 GB/T 2423.5-2019
10	Package Vibration	5-20-200HZ, PSD：0.01-0.01-0.001 Total:0.781g2/HZ, x/y/z 30min	GB/T 4857.23-2021
11	Package Drop Test	Height: X cm,1 corner, 3edges, 6 surfaces Note：X > 10Kg:60cm；≤10Kg:80cm	IEC60068-2-32:1990 GB/T2423.8—1995

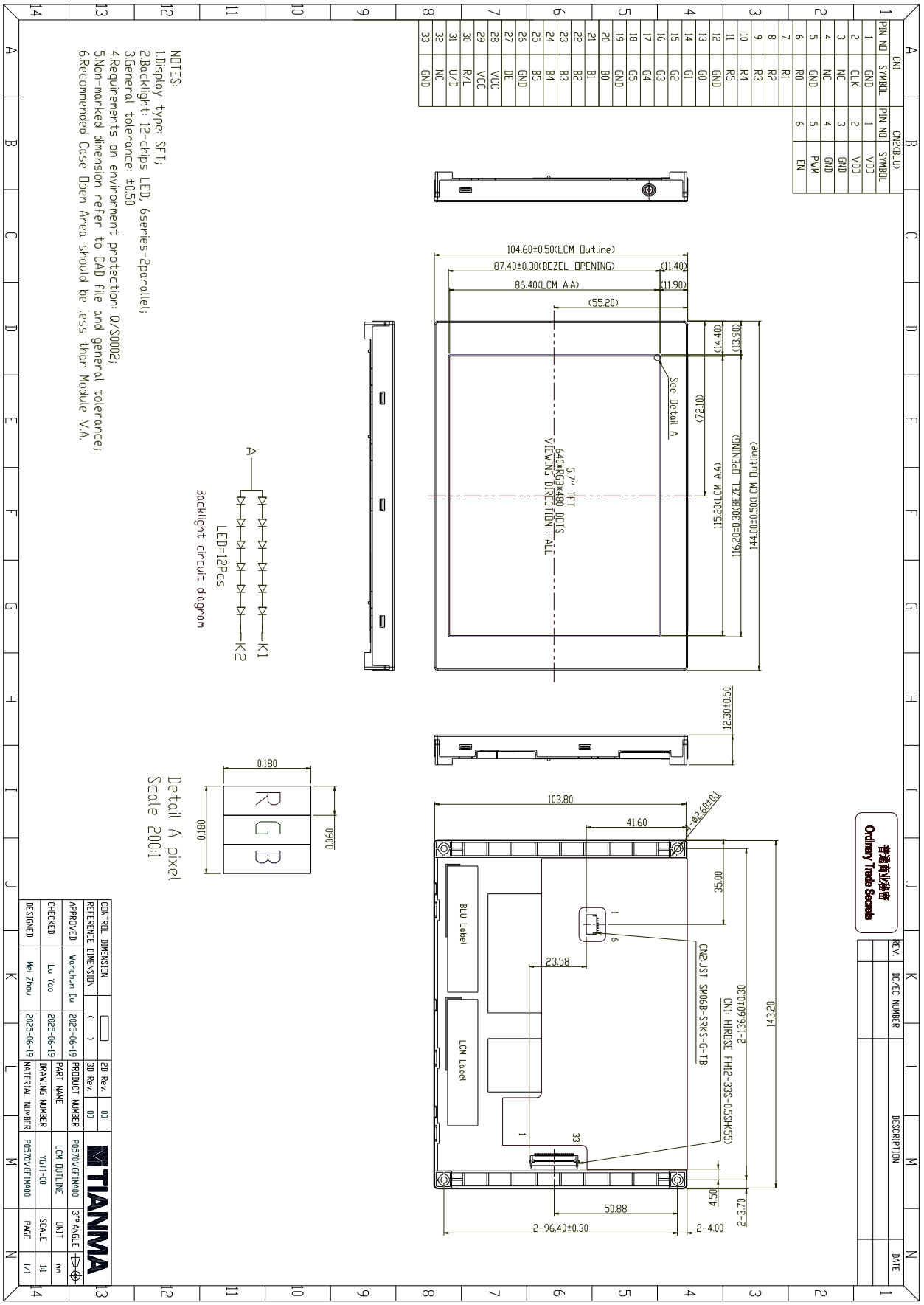
Table 8.1 RA test condition

Note 1: Temperature is the ambient temperature of sample
Note 2: See the following figure for discharge points



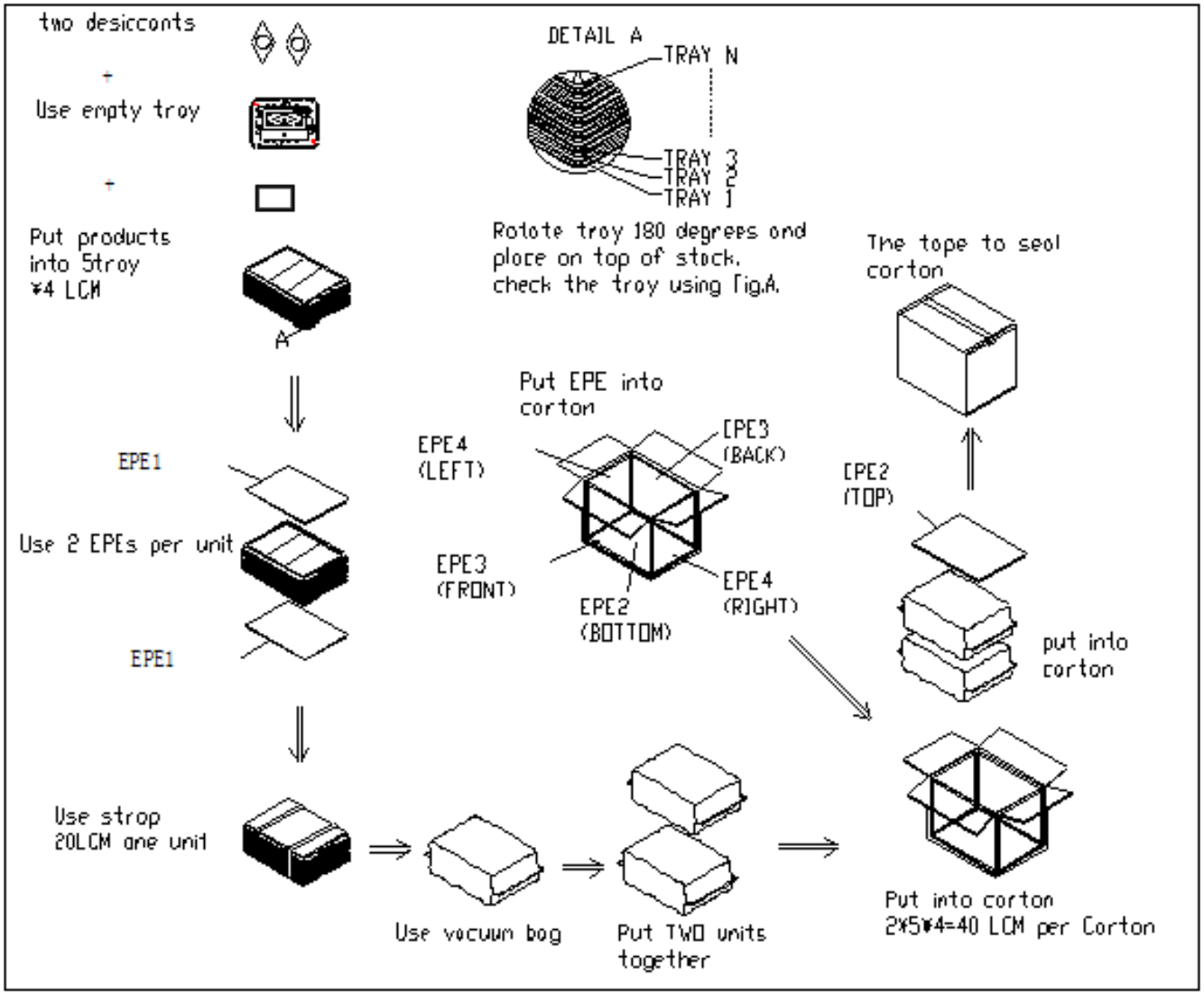
Note 3: Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.
Note 4: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product's function only be guaranteed, but not for all of the cosmetic specification.

9. Mechanical Drawing



10. Packing Instruction

No	Item	Model (Material)	Dimensions (mm)	Unit Weight (Kg)	Q'ty	Remark
1	LCM	P0570VGF1MA00	61.24×89.9×4.42	TBD	40	
2	Tray	PET	356×256×14.5	0.098	12	
3	EPE1	EPE	336×246×6	0.01	4	
4	EPE2	EPE	375×275×10	0.014	2	
5	EPE3	EPE	375×245×10	0.014	2	
6	EPE3	EPE	250×250×12	0.015	2	
7	Carton	Corrugated Paper	398×290×2855	0.75	1	
8	Vacuum bag	PE	575×460	0.042	2	
9	Lable	Paper	100×52	0.001	1	
10	Desiccant	Desiccant	35×45	0.002	4	
11	Total weight	TBD				



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.