MODEL NO : P1040XGF1MA00

SPEC VERSION : Ver 1.1

ISSUED DATE: 2020-10-15

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

Customer :________________________

Approved by	Notes

TIANMA Confirmed :

Prepared by	Checked by	Approved by
Gang.Li		

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Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020-08-05	Preliminary Specification Released.	Gang.Li
1.1	2020-10-15	Update BL pin description on page6.	Gang.Li

1 General Specifications

Feature		Spec
Display Spec.	Size	10.4 inch
	Resolution	1024(RGB) x 768
	Technology Type	a-Si
	Pixel Configuration	R.G.B. Vertical Stripe
	Pixel pitch(mm)	0.2055x0.2055
	Display Mode	SFT with Normally Black
	Surface Treatment	Anti-Glare
	Viewing Direction	All direction
Mechanical Characteristics	LCM (W x H x D) (mm)	230.00x180.2x9.5
	Active Area(mm)	210.432×157.824
	With /Without TSP	Without Touch screen
	Matching Connection Type	CN1: FI-S20S (JAE) CN2:SHLP-10V-S-B (JST)
	Weight (g)	TBD
Electrical Characteristics	Interface	1port LVDS, 6/8bit selectable
	Color Depth	16.7M/262K

Note 1: Requirements on Environmental Protection: Q/S0002

Note 2: LCM weight tolerance: ± 5%

2 Input/Output Terminals

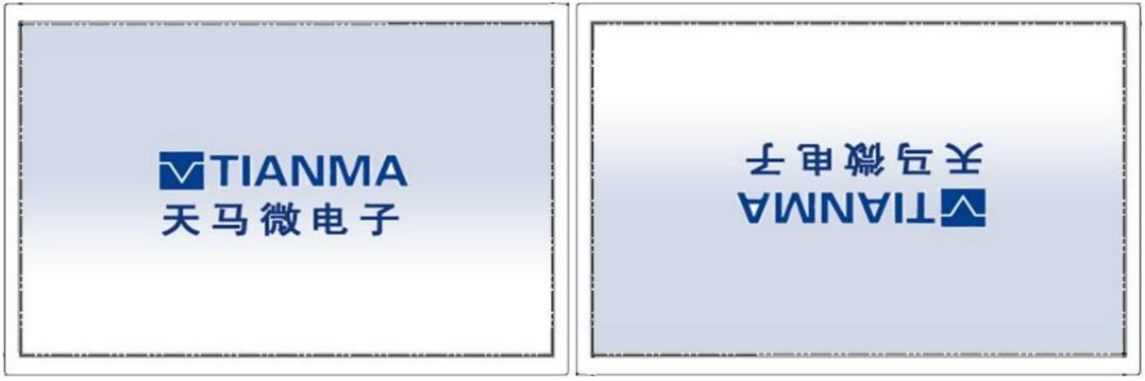
2.1 TFT LCD panel

Connector type:JAE FI-SEB20P-HFE
Matching Connector:FI-S20S or compatible

No.	Name	Symbol	Pin Function Description	Remark
1	VCC	P	Power supply(+3.3V)	
2	VCC	P	Power supply(+3.3V)	
3	GND	P	Ground	
4	GND	P	Ground	
5	Link 0-	I	- LVDS differential data input(R0~R5,G0)	
6	Link 0+	I	+ LVDS differential data input(R0~R5,G0)	
7	GND	P	Ground	
8	Link 1-	I	- LVDS differential data input(G1~G5,B0~B1)	
9	Link 1+	I	+ LVDS differential data input(G1~G5,B0~B1)	
10	GND	P	Ground	
11	Link 2-	I	- LVDS differential data input (B2~B5,-,-,DE)	
12	Link 2+	I	+ LVDS differential data input (B2~B5,-,-,DE)	
13	GND	P	Ground	
14	CLKIN	I	- LVDS differential data input	
15	CLKIN	I	+ LVDS differential data input	
16	GND	P	Ground	
17	Link 3-	I	- LVDS differential data input(R6~R7,G6~G7,B6~B7)	
18	Link 3+	I	+ LVDS differential data input(R6~R7,G6~G7,B6~B7)	
19	Mode	I	L: 6bit H: 8bit	
20	SC	I	Display direction selection	

P: Power/GND; I: Input pin

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



SC=Low SC=High

TIANMA

2.2 Backlight(CN2)

Connector : SM10B-SHLS-TF(LF)(SN)
Matching connector：SHLP-10V-S-B

No.	Name	Symbol	Pin Function Description	Remark
1	NC	-	No connection	
2	NC	-	No connection	
3	LED_K1	I	LED Cathode 1	
4	LED_A1	I	LED Anode1	
5	LED_A2	I	LED Anode2	
6	LED_K2	I	LED Cathode 2	
7	LED_K3	I	LED Cathode 3	
8	LED_A3	I	LED Anode3	
9	LED_A4	I	LED Anode4	
10	LED_K4	I	LED Cathode 4	

P: Power/GND; I: input pin

3 Absolute Maximum Ratings

3.1 Driving TFT LCD Panel

GND=0V, Ta = 25°C

Item	Symbol	Min	Max	Unit	Remark
Power Voltage for LCD	VDD	-0.5	5.0	V	Note1
Input voltage for LCD	VIN	-0.5	5.0	V	
Operating Temperature	TOPR	-30	+80	℃	Note2
Storage Temperature	TSTG	-40	+85	℃	
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/m^3	Ta＞70℃

Table 3 Absolute Maximum Ratings

Note1: V_{IN} 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

GND=0V, Ta=25℃

Item		Symbol	MIN	TYP	MAX	Unit	Remark
Power supply Voltage		VDD	3.20	3.30	3.40	V	
Power supply ripple		Vp-p	-	-	100	mV	
Power supply current		IDD	300	450	675	mA	
Power consumption		P	-	1485	-	mW	Note1
Differential input voltage		|Vid|	200	-	600	mV	
Differential input common voltage		Vcm	-	1.2	-	V	
Differential input threshold voltage	Low level	VTL	-100	-	-	mV	
	High level	VTH	-	-	100	mV	
Inrush current		Irush	-	-	1.5	A	Note2

Table 4.1 LCD module electrical characteristics

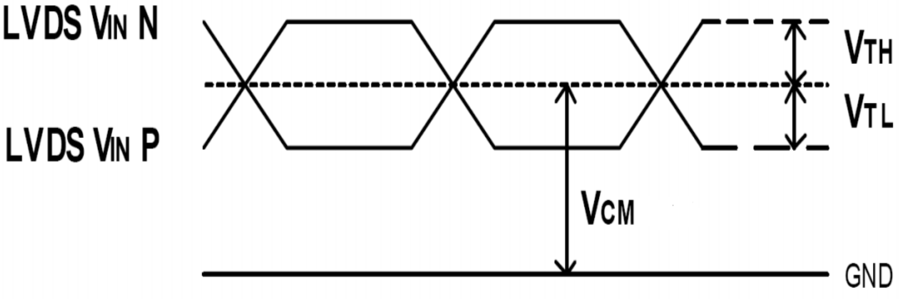
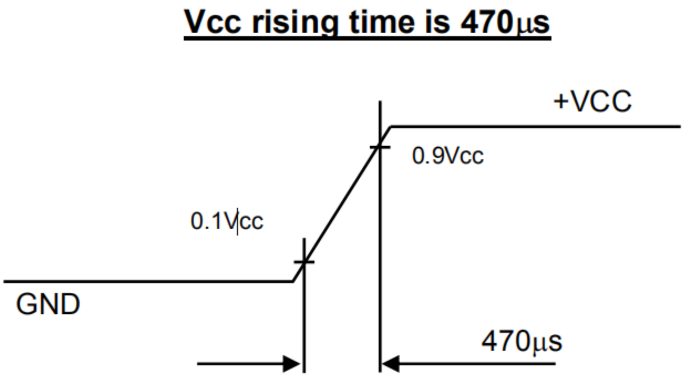


Figure 4.1.1 LVDS DC timing diagram

Note1: To test the current dissipation, using the “white “testing pattern.



Note2: Inrush current definition.

4.2 Driving Backlight

Ta=25℃

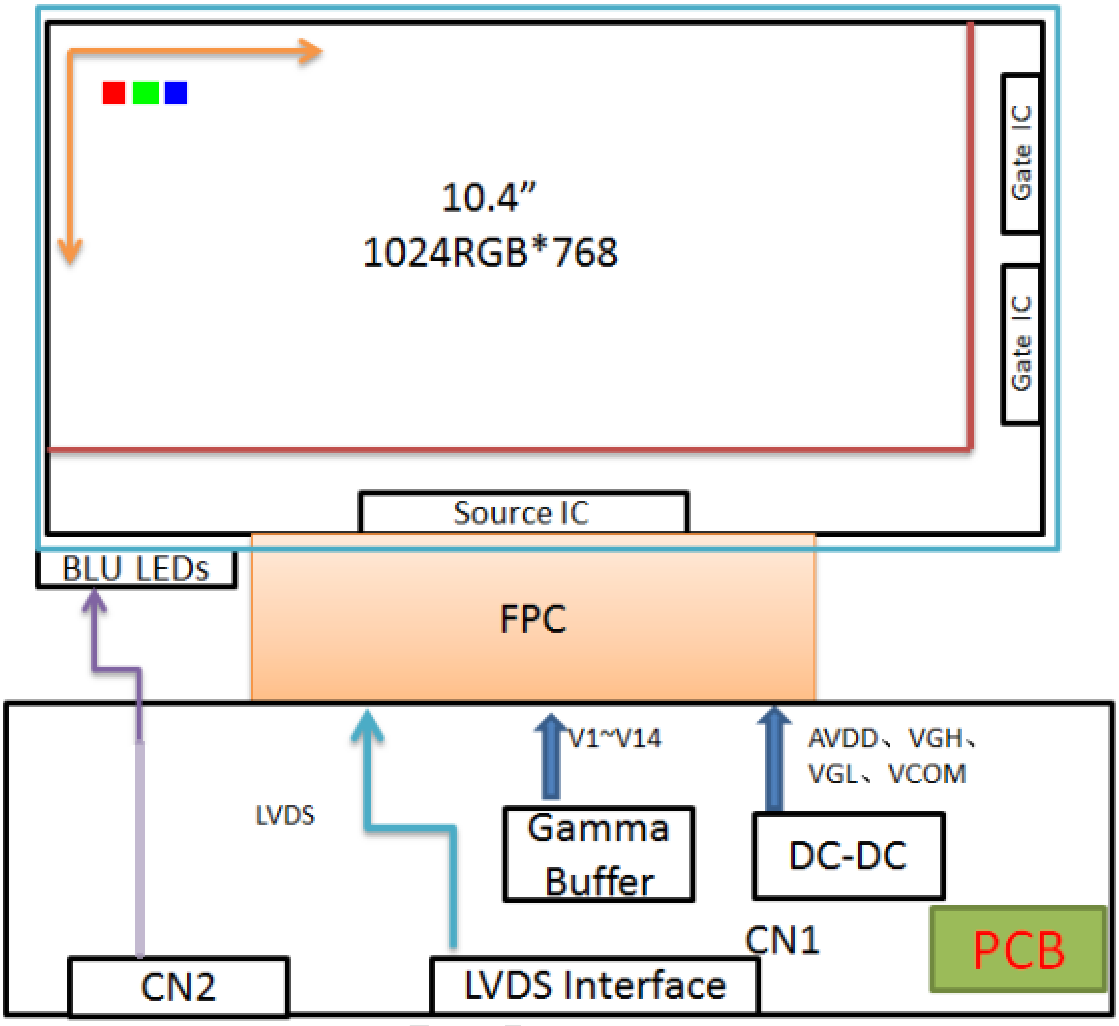
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	480	-	mA	24 LEDs (6LED Serial, 4 LED Parallel)
Forward Current Voltage	V_F	-	19.2	-	V	
Backlight Power Consumption	W_{BL}	-	9216	-	mW	
Operating Life Time	--	-	100000	-	hrs	Note

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.

4.3 Block Diagram


10.4"
1024RGB*768
Gate IC
Gate IC
Source IC
BLU LEDs
FPC
LVDS
V1~V14
AVDD、VGH、
VGL、VCOM
Gamma
Buffer
DC-DC
CN1
PCB
CN2
LVDS Interface

5 Timing Chart

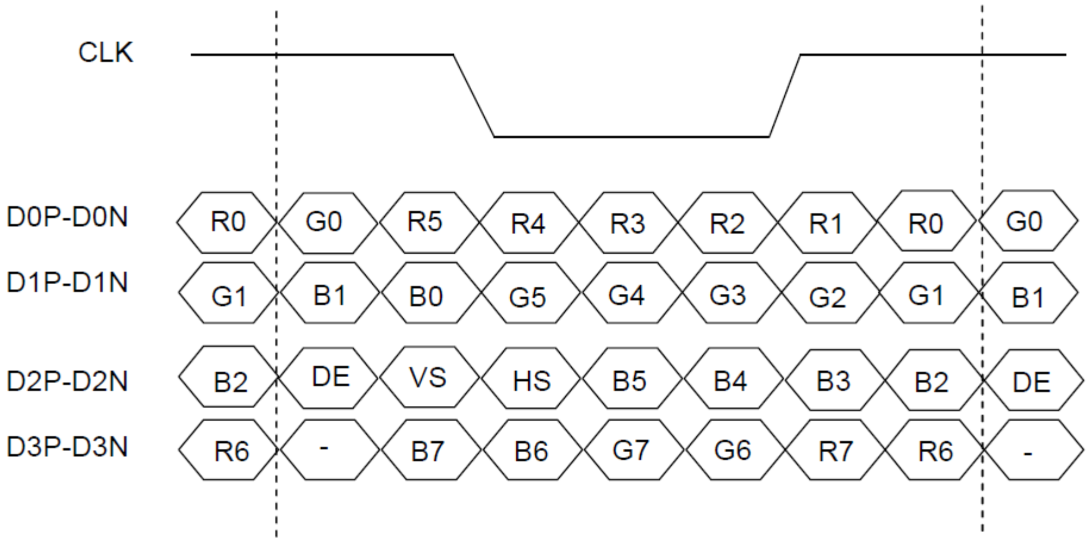
5.1 Timing Parameter

Parameter	Symbol	Min	Typ	Max	Unit	Remark
CLK frequency	1/tclk	57	65	70.5	MHz	
Horizontal blanking time	tHBT	176	320	376	tclk	tHBP + tHFP
Horizontal back porch	tHBP	160			tclk	
Horizontal display area	tHD	-	1024	-	tclk	
Horizontal front porch	tHFP	16	160	216	tclk	
Horizontal period	tH	1200	1344	1400	tclk	
Horizontal pulse width	tHPW	1	2	140	tclk	
Vertical blanking time	tVBT	24	38	72	tH	tVBP + tVFP
Vertical back porch	tVBP	23			tH	
Vertical display area	tVD		768		tH	
Vertical front porch	tVFP	1	15	49	tH	
Vertical period	tV	792	806	840	tH	
Vertical pulse width	tVPW	1	2	20	tH	
Frame Rate	F	-	60	-	HZ	

Table 5.1 Timing table

5.2 LVDS data input format

8-bit mode data input


CLK
D0P-D0N
R0 G0 R5 R4 R3 R2 R1 R0 G0
D1P-D1N
G1 B1 B0 G5 G4 G3 G2 G1 B1
D2P-D2N
B2 DE VS HS B5 B4 B3 B2 DE
D3P-D3N
R6 - B7 B6 G7 G6 R7 R6 -

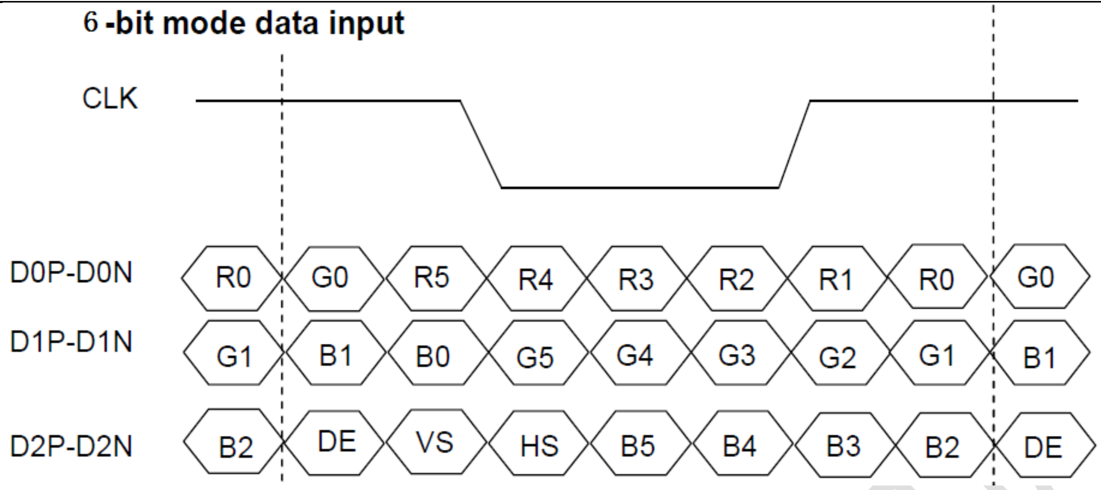

6 -bit mode data input
CLK
D0P-D0N
R0
G0
R5
R4
R3
R2
R1
R0
G0
D1P-D1N
G1
B1
B0
G5
G4
G3
G2
G1
B1
D2P-D2N
B2
DE
VS
HS
B5
B4
B3
B2
DE

Figure 5.2 LVDS data input format(VESA Standard)

5.3 Power on/off sequence

Item	Symbol	Min	Typ	Max	Unit	Remark
VCC on to VCC stable	TP1	0.5	-	20	ms	
VCC stable to signal on	TP2	1	-	-	ms	
Signal on to LED on	TP3	200	-	-	ms	
VDD off time	TP4	0	-	10	ms	
VDD off to next VDD on	TP5	500	-	-	ms	
Signal off before VDD off	TP6	1	-	-	ms	
LED off before signal off	TP7	200	-	-	ms	

Table 5.3Power on/off sequence

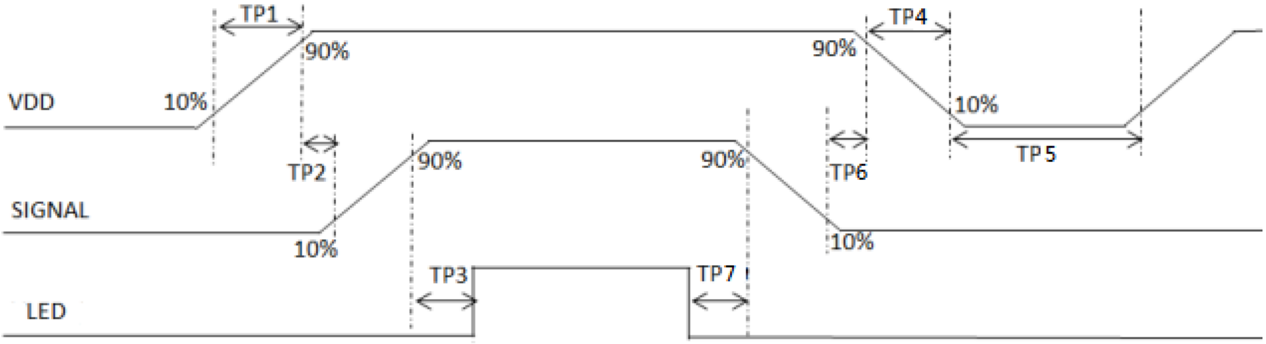

TP1
90%
10%
VDD
90%
TP4
10%
TP5
TP2
90%
90%
TP6
SIGNAL
10%
10%
TP3
TP7
LED

Figure 5.3 Power on/off sequence

6 Optical Characteristics

Ta=25℃

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	$\theta=0^{o}$	800	1000	-		Note 3
Response Time		T_{ON}	25℃	-	35	50	ms	Note 4
		T_{OFF}						
Chromaticity	**White**	x	Backlight is on	0.263	0.313	0.363		Note 1,5
		y		0.279	0.329	0.379		
	Red	x		TBD	TBD	TBD		Note 1,5
		y		TBD	TBD	TBD		
	Green	x		TBD	TBD	TBD		Note 1,5
		y		TBD	TBD	TBD		
	Blue	x		TBD	TBD	TBD		Note 1,5
		y		TBD	TBD	TBD		
Uniformity		U		75	85		%	Note 6
NTSC				45	50		%	Note 5
Luminance		L		1150	1300		cd/m^2	Note 7

Test Conditions:

1. I_F= 120 mA (for each LED), 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.

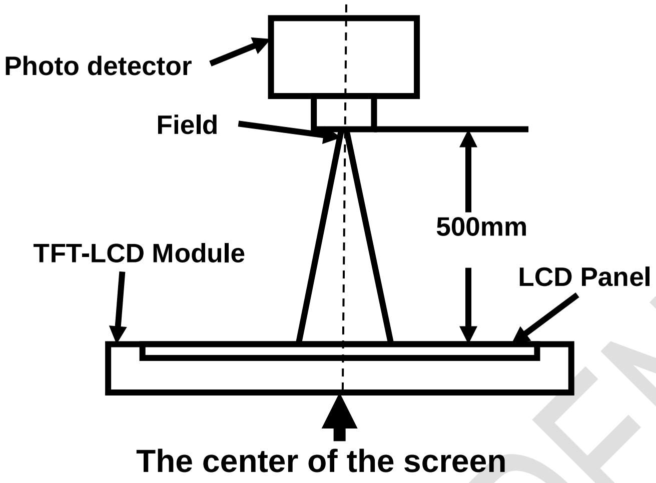
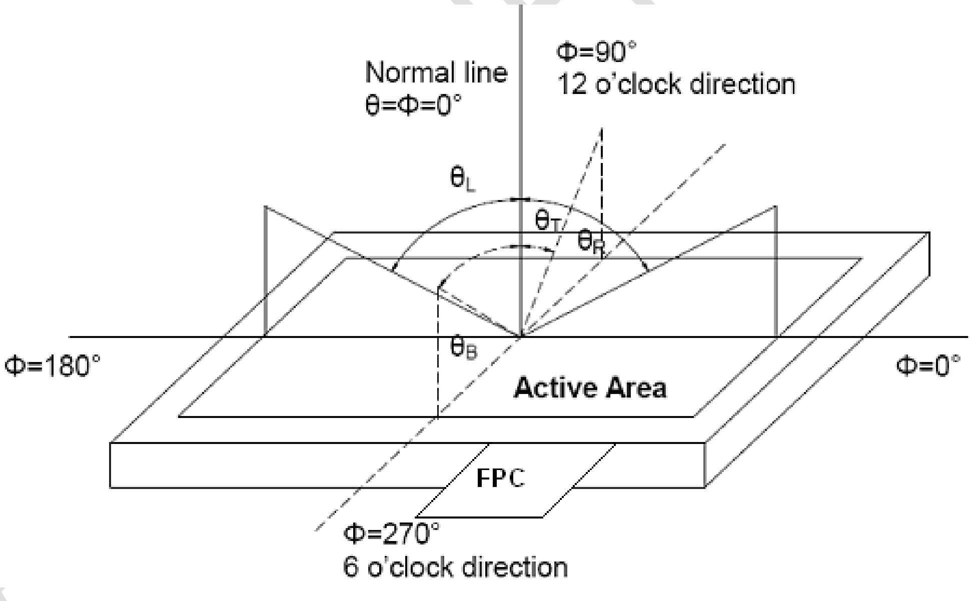


Photo detector
Field
500mm
TFT-LCD Module
LCD Panel
The center of the screen

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

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


Normal line
θ=Φ=0°
Φ=90°
12 o'clock direction
θL
θT
θR
θB
Φ=180°
Φ=0°
Active Area
FPC
Φ=270°
6 o'clock direction

Note 3: Definition of contrast ratio

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

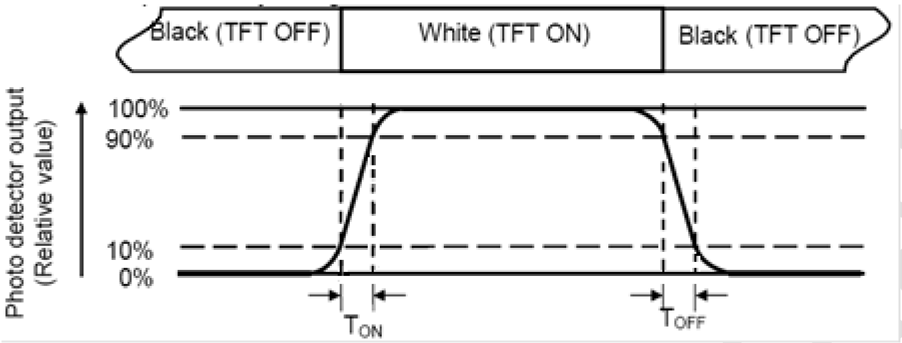
“White state “: The state is that the LCD should drive by Vwhite.

“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 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

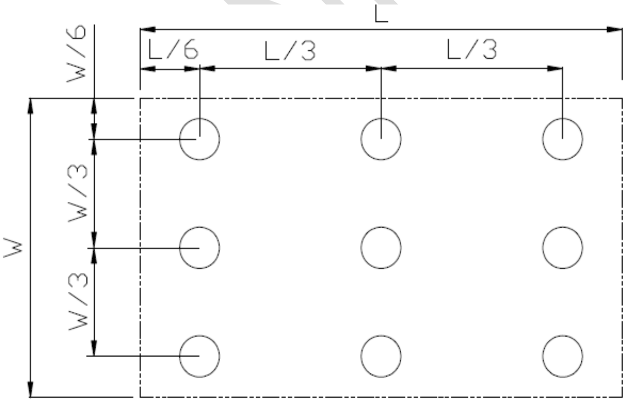
Color coordinates measured at center point of LCD.

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.

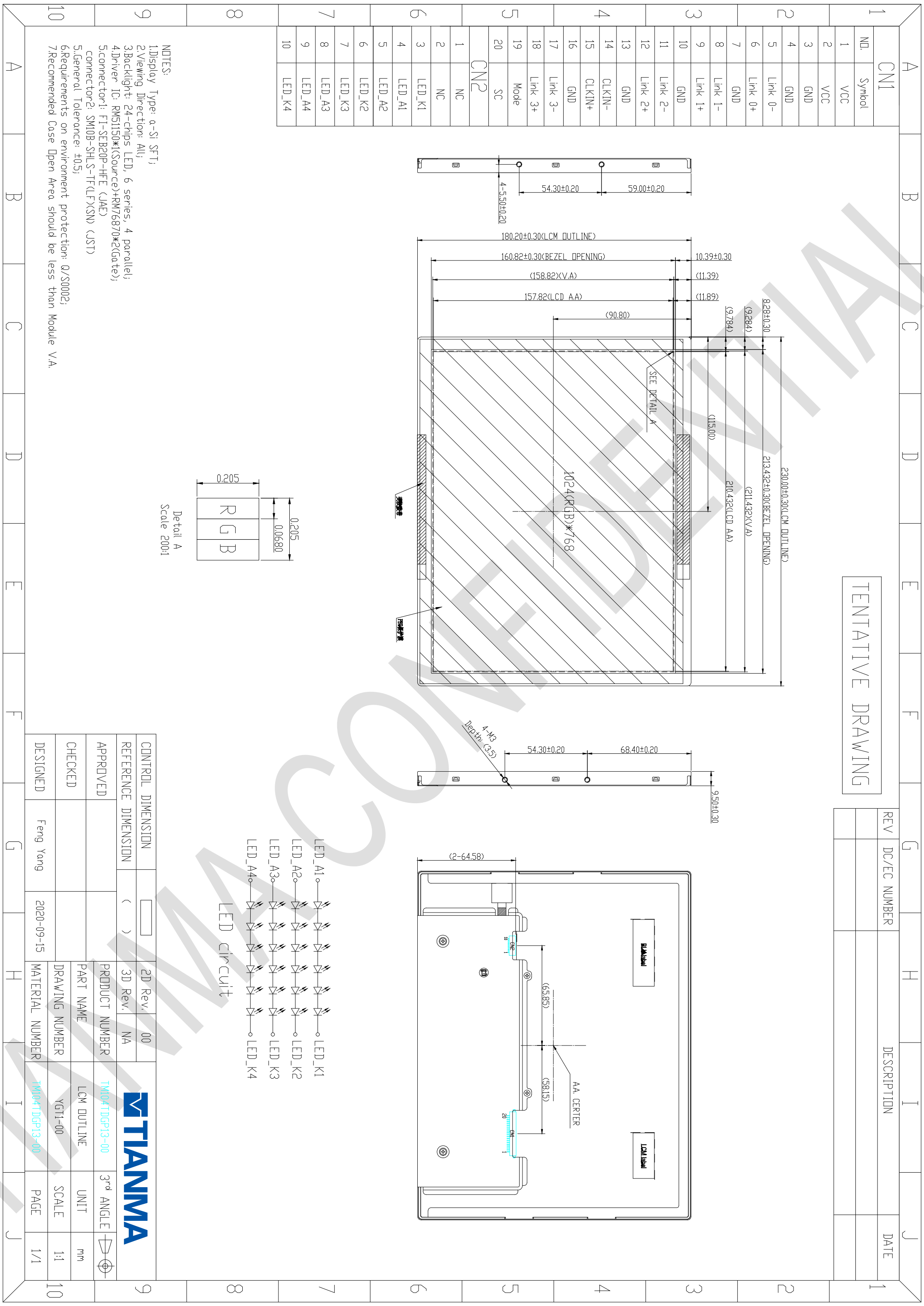
7 Environmental / Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ta = +80℃, 500 hours	IEC60068-2-1 GB2423.2
2	Low Temperature Operation	Ta = -30℃, 500 hours	IEC60068-2-1 GB2423.1
3	High Temperature Storage	Ta = +85℃, 500 hours	IEC60068-2-1 GB2423.2
4	Low Temperature Storage	Ta = -40℃, 500 hours	IEC60068-2-1 GB2423.1
5	High Temperature and Humidity Operation	Ta = +60℃, 90% RH max,500hours	IEC60068-2-78 GB/T2423.3
6	Thermal Shock (non-operation)	-40℃ 30 min~+85℃ 30 min, Change time:5min, 100 Cycle	Start with cold temperature, End with high temperature, IEC60068-2-14,GB2423.22
7	ESD	C=150pF,R=330Ω,5point/panel Air:±15Kv,5times; Contact:±8Kv,5times (Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)	IEC61000-4-2 GB/T17626.2
8	Vibration Test (non-operation)	Vibration level: 66.64m/s^2(6.8G) Waveform:sinusoidal Frequency range: 20~500Hz Frequency sweep rate: 0.5 octave/mim Duration: one sweep from 20 to 500Hz in each of three mutually perpendicular axis(each x,y,z axis:1hour,total 3hrs）	GB/T 2423.10-2008 ; GB/T 2423.56-2006
9	Shock Test	Shock level:1470m/s^2(150G) Waveform:half sinusodial wave,2ms Number of shocks: one shock input in each direction of three mutually perpendicular axies for a total of six shock inputs	GB/T 2423.5-1995
10	Package Drop Test	Height:60cm, 1corner,3edges,6surfaces	GB/T 4857.5-1992
11	Package Vibration	Frequency：5-20-200HZ，PSD：0.01-0.01-0.001 Total:0.781g2/HZ,x/y/z axis per 30min）	GB/T 4857.23-2012

Note1: Ta is the ambient temperature of sample.

Note2: 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



NO.	Symbol
1	VCC
2	VCC
3	GND
4	GND
5	Link 0-
6	Link 0+
7	GND
8	Link 1-
9	Link 1+
10	GND
11	Link 2-
12	Link 2+
13	GND
14	CLKIN-
15	CLKIN+
16	GND
17	Link 3-
18	Link 3+
19	Mode
20	SC

CN2

1	NC
2	NC
3	LED_K1
4	LED_A1
5	LED_A2
6	LED_K2
7	LED_K3
8	LED_A3
9	LED_A4
10	LED_K4

NOTES:
1.Display Type: a-Si SFT;
2.Viewing Direction: All;
3.Backlight: 24-chips LED, 6 series, 4 parallel;
4.Driver IC: RM5150*1(Source)+RM76870*2(Gate);
5.connector1: FI-SEB20P-HFE (JAE)
connector2: SM10B-SHLS-TF(LF)(SN) (JST)
5.General Tolerance: ±0.5;
6.Requirements on environment protection: Q/S0002;
7.Recommended Case Open Area should be less than Module V.A.

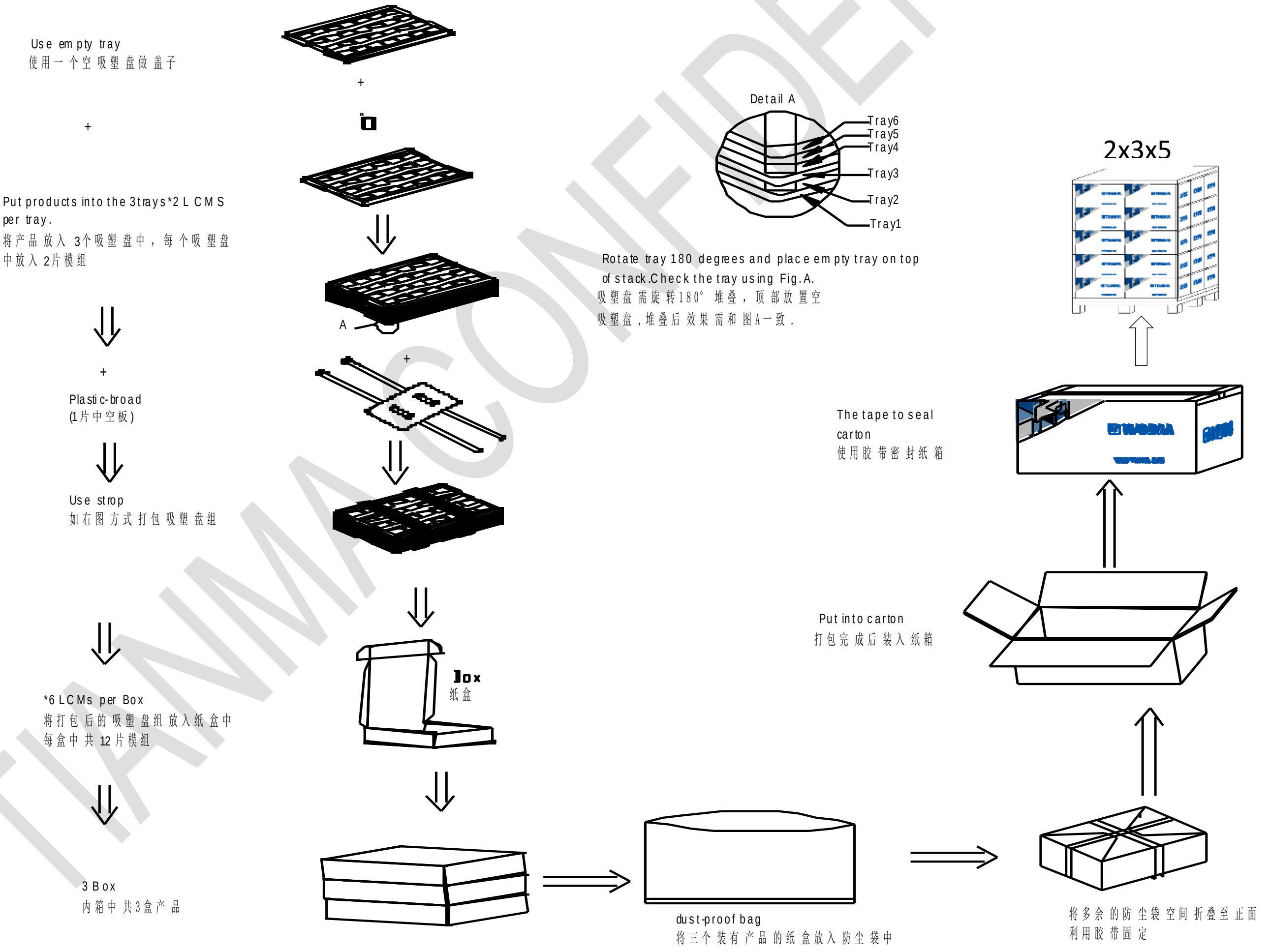
CONTROL DIMENSION	☐	2D Rev.	00	TIANMA	
REFERENCE DIMENSION	( )	3D Rev.	NA		
APPROVED		PRODUCT NUMBER		TM104TDGP13-00	3rd ANGLE
CHECKED		PART NAME		LCM OUTLINE	UNIT mm
DESIGNED	Feng Yang	2020-09-15	DRAWING NUMBER	YGT1-00	SCALE 1:1
			MATERIAL NUMBER	TM104TDGP13-00	PAGE 1/1

CN1
4-5.50±0.20
54.30±0.20
59.00±0.20
180.20±0.30(LCM OUTLINE)
160.82±0.30(BEZEL OPENING)
(158.82)(V.A)
157.82(LCD AA)
(90.80)
10.39±0.30
(11.39)
(11.89)
8.28±0.30
(9.284)
(9.784)
SEE DETAIL A
(115.00)
230.00±0.30(LCM OUTLINE)
213.43±0.30(BEZEL OPENING)
(211.43)(V.A)
210.43(LCD AA)
1024(RGB)*768
0.205
R
G
B
0.0680
0.205
Detail A
Scale 200:1
4-M3
Depth (3.5)
54.30±0.20
68.40±0.20
9.50±0.30
(2-64.58)
(65.85)
(58.15)
AA CERTER
LED circuit
LED_A1
LED_A2
LED_A3
LED_A4
LED_K1
LED_K2
LED_K3
LED_K4
TENTATIVE DRAWING
REV
DC/EC NUMBER
DESCRIPTION
DATE
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10

9 Packing Drawing

No	Item	Model (Materiel)	Dimensions(mm)	Unit Weight(Kg)	Quantity
1	LCM Module	TM104TDGPXX-00	230.00×180.2×9.5	TBD	18
2	Tray	PET(Transmit)	485x330x21.5	0.215	12
3	Dust-Proof Bag	PE	235mm x 150m x 0.05	---	1
4	Box	Corrugated paper	520×345×74	0.388	3
5	Carton	Corrugated paper	544x365x250	1.01	1
6	Plastic Board	PE	485×330×5	0.05	3
7	Total Weight	TBD			

Note: LCM quantity per tray:2 pcs. Total LCM quantity in Carton: 2x 9=18 pcs



Use empty tray
使用一个空吸塑盘做盖子

Put products into the 3trays*2 LCMS per tray.
将产品放入 3个吸塑盘中，每个吸塑盘中放入 2片模组

Rotate tray 180 degrees and place empty tray on top of stack.Check the tray using Fig.A.
吸塑盘需旋转180° 堆叠，顶部放置空吸塑盘，堆叠后效果需和图A一致.

Plastic-broad
(1片中空板)

Use strop
如右图方式打包吸塑盘组

*6 LCMs per Box
将打包后的吸塑盘组放入纸盒中
每盒中共 12片模组

3 Box
内箱中共3盒产品

dust-proof bag
将三个装有产品的纸盒放入防尘袋中

将多余的防尘袋空间折叠至正面
利用胶带固定

Put into carton
打包完成后装入纸箱

The tape to seal carton
使用胶带密封纸箱

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.