PHOENIX DISPLAY INTERNATIONAL, INC.

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SPECIFICATION FOR LCD MODULE

CUSTOMER	
PART NUMBER	S043HWV104EN-FC63
DESCRIPTION	4.3 ” TFT-LCD Bar Type with CTP
VERSION	1.0
ISSUE DATE	2023.7.5

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Record of Revisions

Version	Revise Date	Description	Page
1.0	2023-7-5	First Release	-

Contents

1. General Specifications 4

2. Absolute Maximum Ratings 5

3. Elecrical Characteristics 5

4. Interface Pin Assignment 7

5. Interface Characteristics 8

6. Optical Specifications 14

7. Reliability Test Items 17

8. Mechanical Drawing 18

9. Packing 19

10. Precautions for Use of LCD modules 20

1. General Specifications

1.1 LCM General Information

Item	Specification	Unit
LCD Size	4.3	inch
Number of Pixels	800 (H) RGB x 130 (V)	pixels
Display Mode	Normally Black	-
Viewing Direction	Free	o’ clock
Interface	RGB	-
Display Colors	16.7M	colors
Outline Dimension	120.70 (H) x 30.00 (V) x 4.32 (D)	mm
Active Area	108.00 (H) x 17.55 (V)	mm
Pixel Pitch	0.1350 (H) x 0.1350 (V)	mm
Driver IC	ST7262	-
Operation Temperature	-20~70	℃
Storage Temperature	-30~80	℃

1.2 Touch Panel Information

Item	Specification
Touch Structure	G+G
Bonding Type with LCM	OCA Optical Bonding
Driver IC	MXT640T
Interface	I²C
Touch Count Max	5 Points
Surface treatment	-
Surface hardness	6H
I2C slave address	0x4A
Origin of coordinate	Top Left Corner

Note1:Requirements on environmental protection RoHS compliant.

2. Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Note
Analog Supply voltage	VDD	-0.3	5.0	V	Note 1

Note 1:Permanent damage may occur to the LCD module if beyond this specification.
Functional operation should be restricted to the conditions described under normal operating conditions.

3. Elecrical Characteristics

3.1 Recommended Operating Condition for TFT LCD

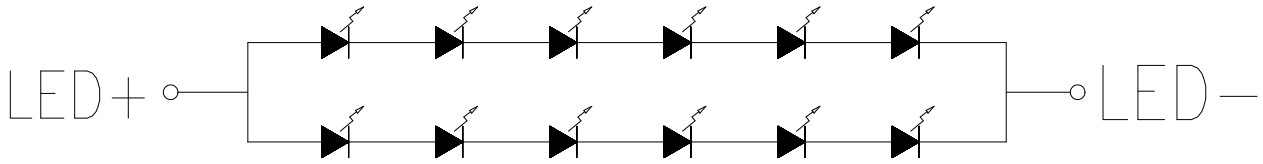
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Analog Supply voltage	VDD	3.0	3.3	3.6	V	
Analog supply current	I_{VDD}	-	TBD	-	mA	VDD=3.3V
Logic input voltage	VIH	0.7*VDD	-	VDD	V	
	VIL	GND	-	0.3*VDD	V	

3.2 Recommended Driving Condition for Backlight

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Driving Current	I_F	-	40	-	mA	
Driving Voltage	V_F	16.2	-	20.4	V	
Power consumption	W_{BL}	0.648	-	0.816	W	
LED Life-Time	N/A	-	50,000	-	Hours	Ta=25℃ Note 1

Note 1:LED lifetime is defined as the module brightness decay 50% of original brightness at Ta=25 degree, typical current.

Note 2:LED circuit :



3.3 Touch Panel

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply voltage	VDD	-	3.3	-	V	
Analog supply current	I_{VDD}	-	TBD	-	mA	VDD=3.3V
Input high-level voltage	VIH	0.7*VDD	-	VDD	V	
Input low -level voltage	VIL	GND	-	0.3*VDD	V	

4. Interface Pin Assignment

4.1 LCM Pin Assignment

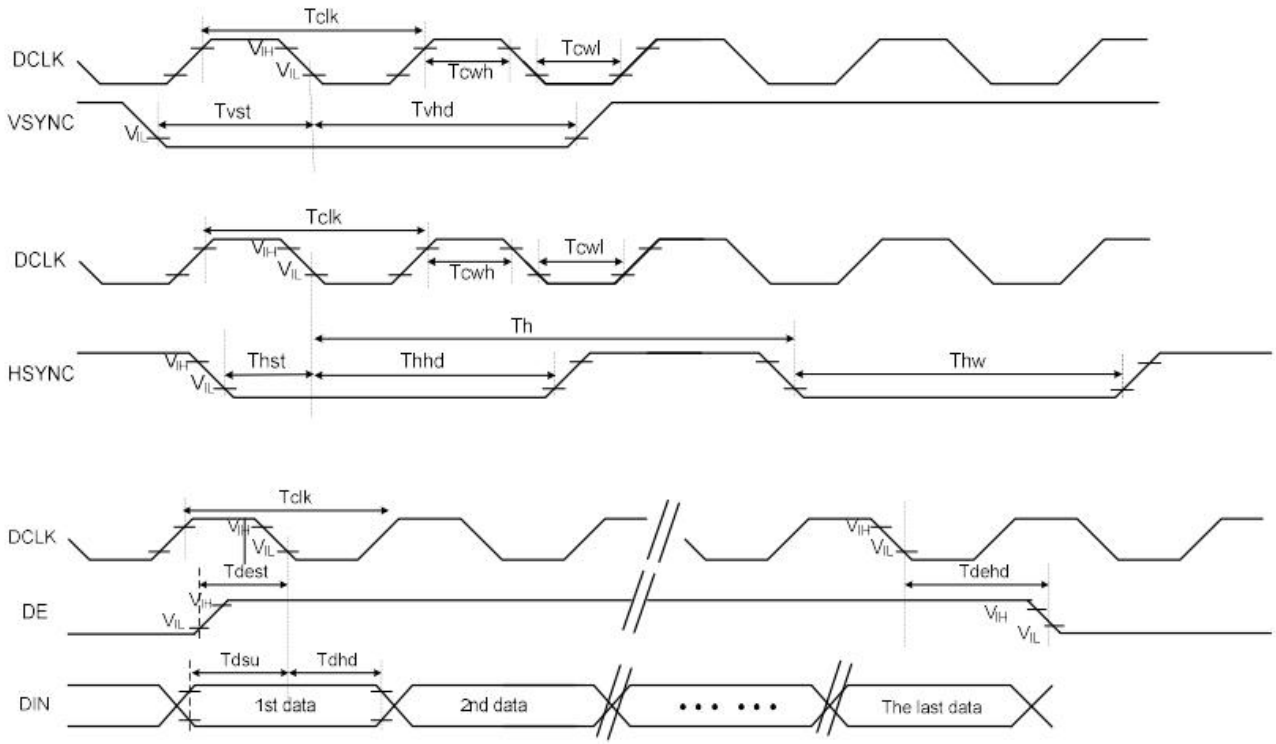
No.	Symbol	Description
1	VLED-	Power for LED backlight (Cathode)
2	VLED+	Power for LED backlight (Anode)
3	GND	Ground
4	VDD	Power supply
5-12	R0-R7	Data bus
13-20	G0-G7	Data bus
21-28	B0-B7	Data bus
29	GND	Ground
30	DCLK	Dot-clock signal and oscillator source
31	DISP	Standby mode. Normally pulled high DISP="1": Normally operation (Default) DISP="0": Timing controller, source driver will turn off ,all output are High
32	NC	No connection
33	NC	No connection
34	DE	Data enable input. Active high to enable the input data bus under "DE Mode"
35	NC	No connection
36	GND	Ground
37	XR(NC)	No connection
38	YD(NC)	No connection
39	XL(NC)	No connection
40	YU(NC)	No connection

4.2 Touch FPC Pin Assignment

No.	Symbol	Description
1	GND	Ground
2	VDD-3.3V	Power supply(3.3V)
3	SCL-3.3V	I2C clock input for CTP(3.3V)
4	GND	Ground
5	SDA-3.3V	I2C data input and output for CTP(3.3V)
6	GND	Ground
7	RST	Reset Pin for CTP
8	NC	No connection
9	INT-3.3V	Interrupt signal for CTP(3.3V)
10	GND	Ground

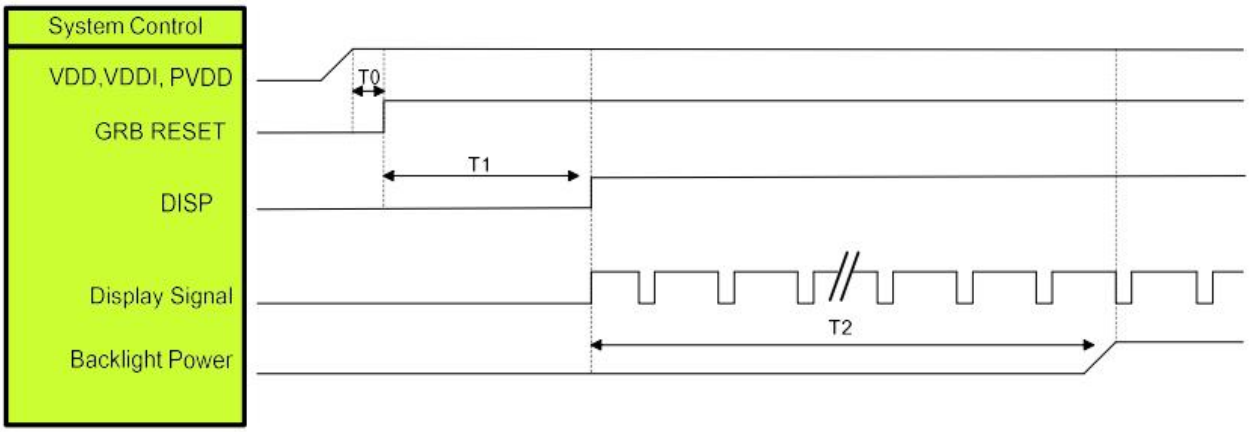
5. Interface Characteristics

5.1 System Bus Timing for RGB Interface



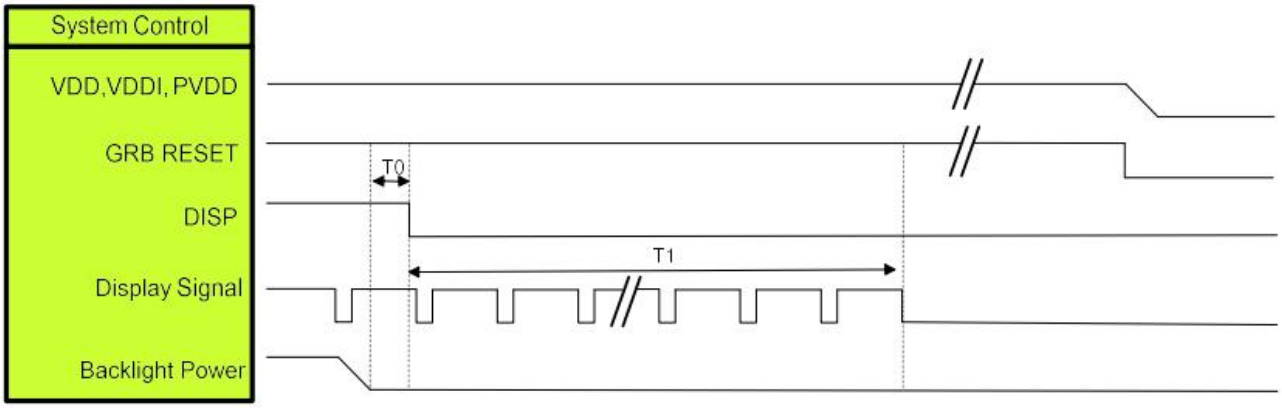
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tcw	40	50	60	%	
HSYNC Width	Thw	2	-	-	DCLK	
HSYNC Period	Th	55	60	65	us	
VSYNC Setup Time	Tvst	12	-	-	ns	
VSYNC Hold Time	Tvhd	12	-	-	ns	
HSYNC Setup Time	Thst	12	-	-	ns	
HSYNC Hold Time	Thhd	12	-	-	ns	
Data Setup Time	Tdsu	12	-	-	ns	
Data Hold Time	Tdhd	12	-	-	ns	
DE Setup Time	Tdest	12	-	-	ns	
DE Hold Time	Tdehd	12	-	-	ns	

5.2 Power On Sequence



Symbol	Description	Min. Time	Unit
T0	System power stability to GRB RESET signal	0	ms
T1	GRB RESET= “High” to DISP=”High”	10	ms
T2	Display Signal output to Backlight Power on	250	ms

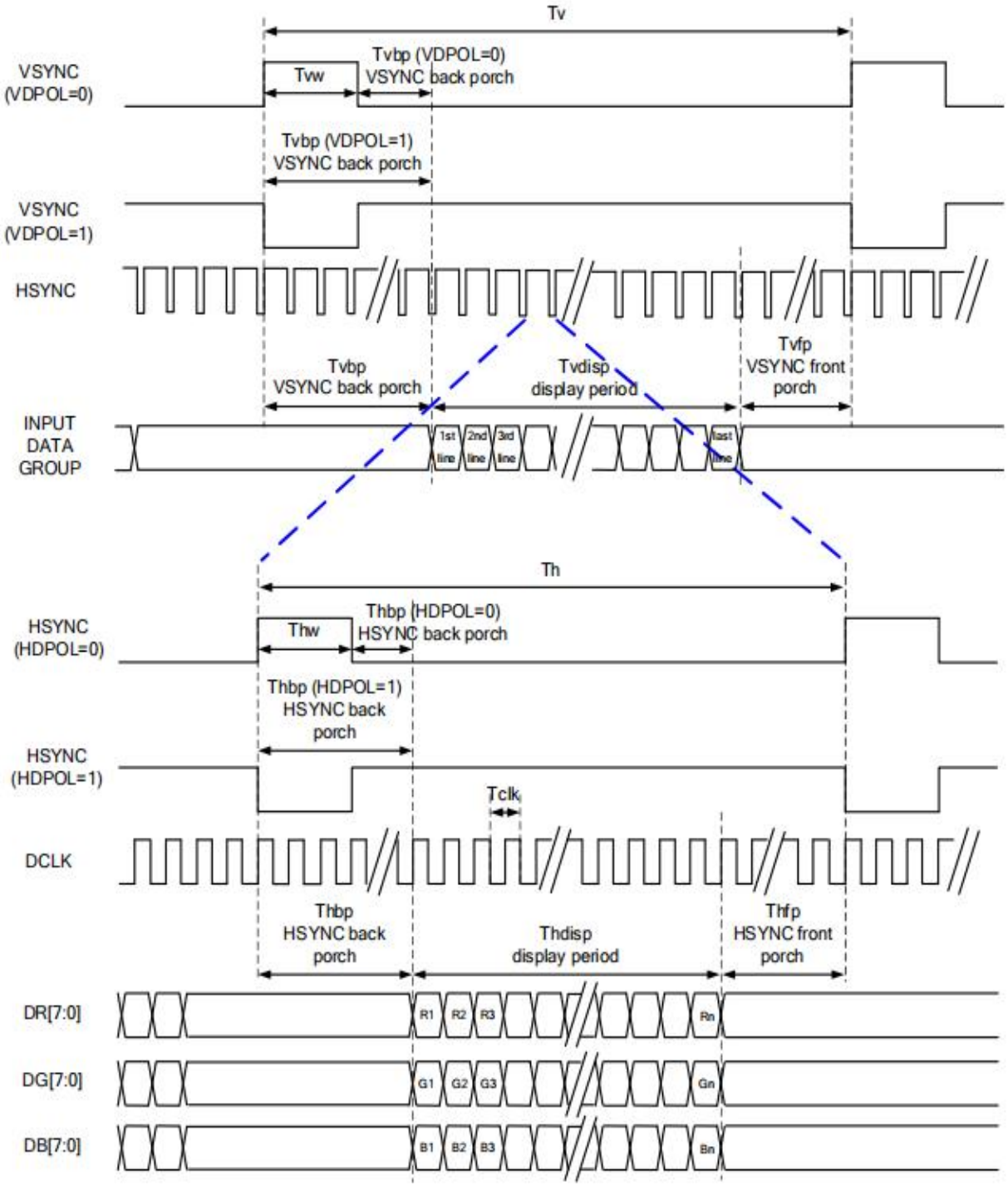
5.3 Power Off Sequence



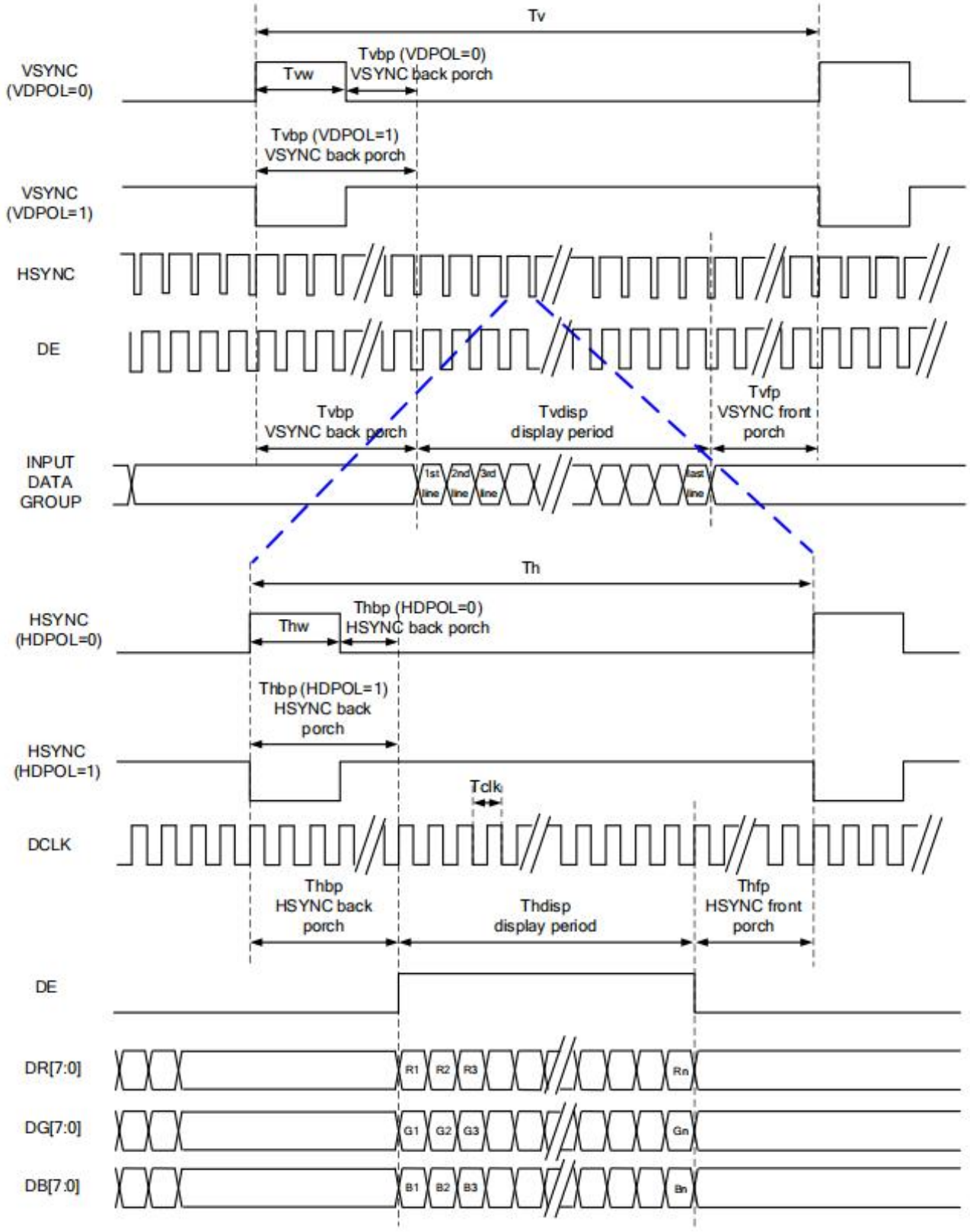
Symbol	Description	Min. Time	Unit
T0	Backlight Power off to DISP=”Low”	5	ms
T1	DISP=”Low” to IC internal voltage discharge complete	80	ms

5.4 RGB Interface

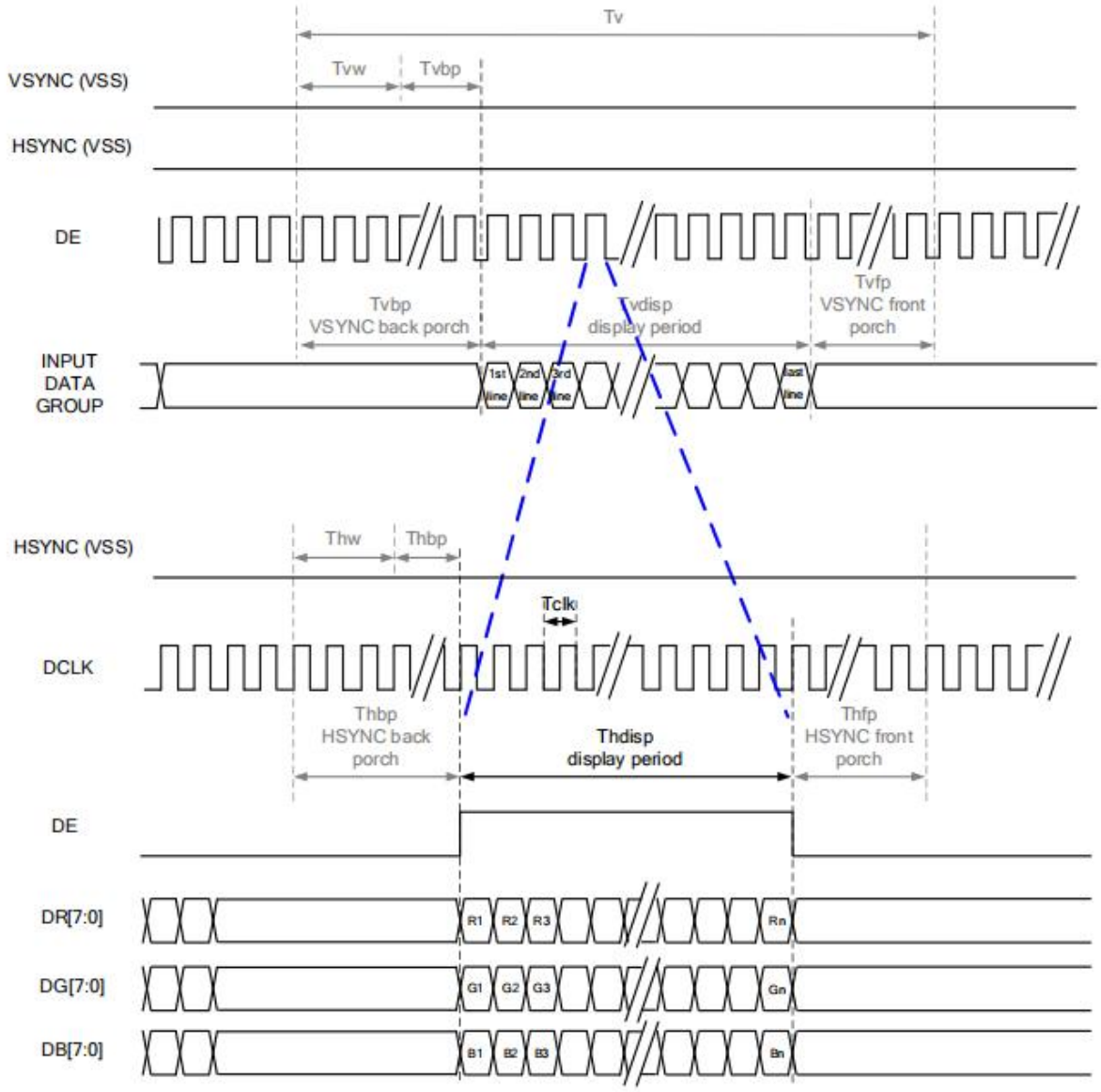
5.4.1 SYNC Mode



5.4.2 SYNC-DE Mode



5.4.3 DE Mode



RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Note: "Input" means these signals are driven by host side.

5.4.4 Parallel 24-bit RGB Input Timing

Parallel 24-bit RGB Input Timing (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

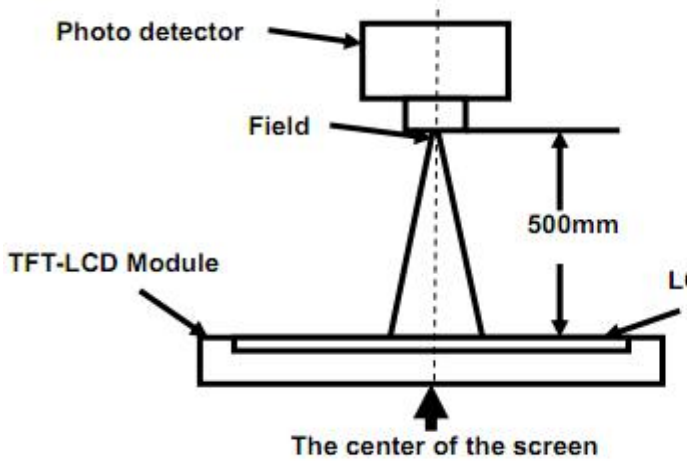
Parallel 24-bit RGB Interface Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	23	25	27	MHz	
HSYNC	Period Time	Th	-	816	896	DCLK	
	Display Period	Thdisp		800		DCLK	
	Back Porch	Thbp	-	8	48	DCLK	
	Front Porch	Thfp	-	8	48	DCLK	
	Pulse Width	Thw	-	4	8	DCLK	
VSYNC	Period Time	Tv	-	496	504	HSYNC	
	Display Period	Tvdisp		480		HSYNC	
	Back Porch	Tvbp	-	8	12	HSYNC	
	Front Porch	Tvfp	-	8	12	HSYNC	
	Pulse Width	Tvw	-	4	8	HSYNC	

6. Optical Specifications

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR≥10) B/L ON	θ_T	Φ=90°(12 o'clock)	70	80	-	deg	Note2
	θ_B	Φ=270°(6 o'clock)	70	80	-	deg	Note2
	θ_L	Φ=180°(9 o'clock)	70	80	-	deg	Note2
	θ_R	Φ=0°(3 o'clock)	70	80	-	deg	Note2
Response Time	T_{ON}	Normal θ=Φ=0°	-	15	20	msec	Note4
	T_{OFF}		-	15	20	msec	Note4
Contrast Ratio	CR		800	1000	-	-	Note1 Note3
Color Chromaticity	W_X		0.270	0.320	0.37	-	Note1 Note5
	W_Y		0.295	0.345	0.395	-	Note1 Note5
Luminance	L		700	800	-	cd/m²	Note1 Note7
Luminance Uniformity	Y_U		75	80	-	%	Note1 Note6
NTSC	-		45	50	-	%	-

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.



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

Note 2:Definition of viewing angle range and measurement system
Viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

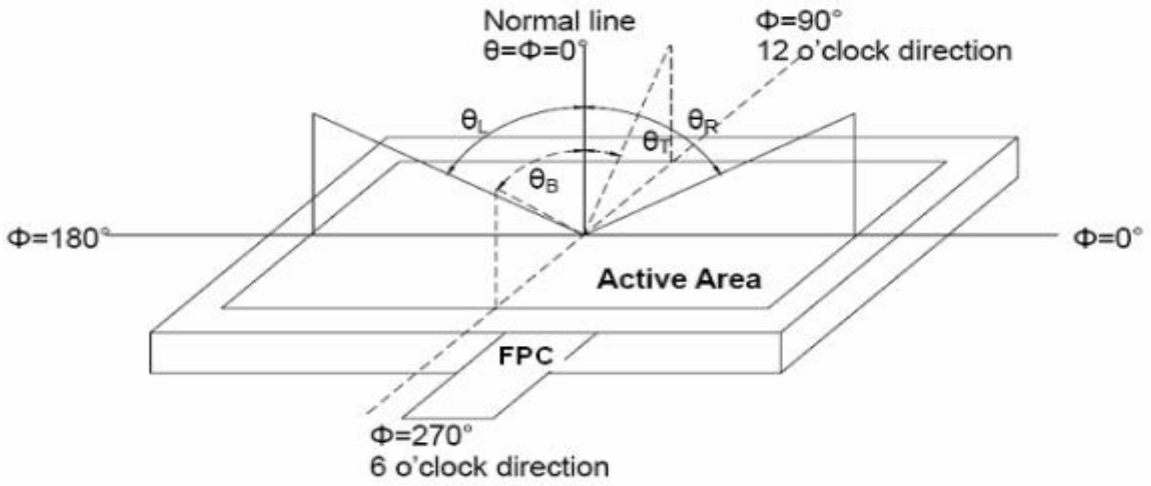


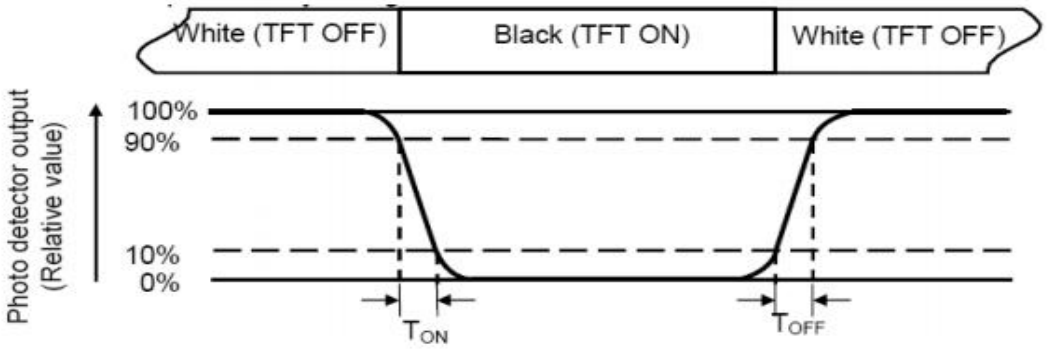
Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

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 (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) 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

The luminance uniformity in surface luminance is determined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance. For more information see FIG.2.

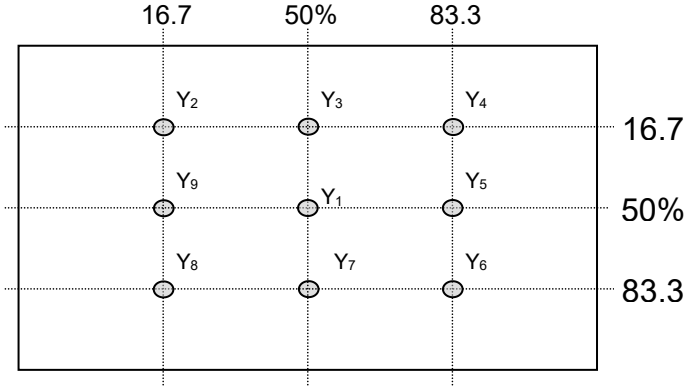


Fig. 2 Definition of points

Note 7:Definition of Luminance (Refer Fig. 2)

Surface luminance is the luminance with all pixels displaying white.

Lv = Average Surface Luminance with all white pixels(P1,P2,P3, ...,Pn).

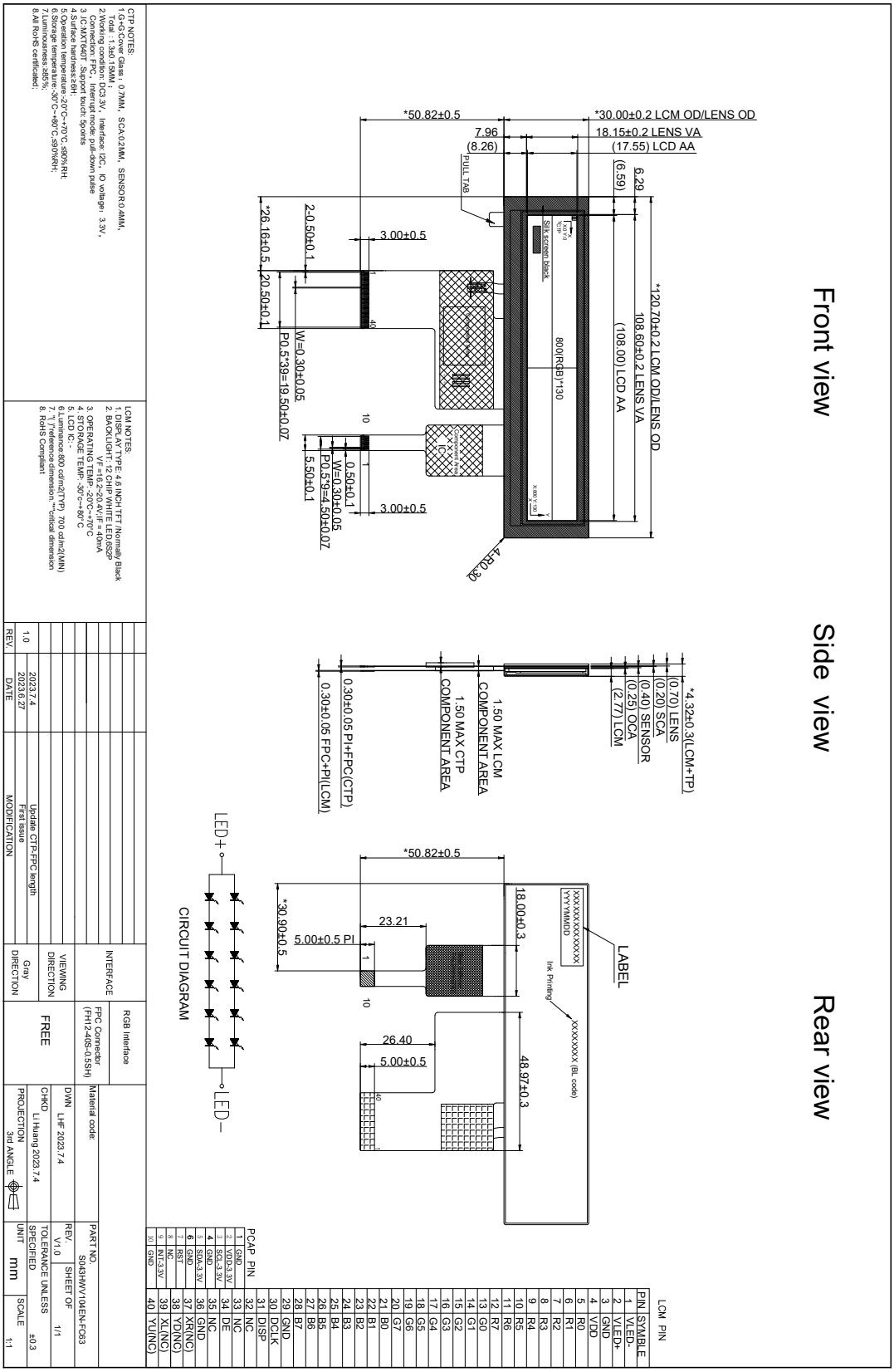
7. Reliability Test Items

Test Item	Test Conditions	
High Temperature Storage	Ta= +80℃	96hrs
Low Temperature Storage	Ta= -30℃	96hrs
High Temperature Operation	Ta= +70℃	96hrs
Low Temperature Operation	Ta= -20℃	96hrs
High Temperature and Humidity Storage	Ta= +60℃, 90% RH	96hrs
Thermal Shock (Non-operation)	-30℃/30 min ~ +80℃/30 min for 20 cycles Start with cold temperature end with high temperature	
Electro Static Discharge	Contact = ± 4 kV, class B Air = ± 8 kV, class B R=330Ω,C=150pF	
Vibration	Sweep: 10Hz~55Hz~10Hz Stroke: 1.5mm 2 hrs for each direction of X .Y. Z.	
Mechanical Shock	60G 6ms,±X,±Y,±Z 3 times for each direction	
Package Drop Test	Height: 60 cm 1 corner, 3 edges, 6 surfaces	

Notes: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:

1). Air bubble in the LCD
2). Seal leak or Glass crack
3). Non display or abnormal display
4). Brightness reduction >50%

8. Mechanical Drawing



CTP NOTES:
1.G+G Cover Glass：0.7MM, SCA:0.2MM, SENSOR:0.4MM, Total：1.3±0.15MM；
2.Working condition: DC3.3V, Interface: I2C; IO voltage: 3.3V,
Connection: FPC, Interrupt mode: pull-down pulse
3. Max report touch: 5points
4.Surface Hardness:≥6H
5.Operation temperature:-20°C~+70°C,≤90%RH;
6.Storage temperature:-30°C~+80°C,≤90%RH;
7.Luminousness:≥85%;
8.All RoHS certificated;

LCM NOTES:
1. LCM TYPE: 4.6 INCH TFT (Normally Black
2. BACKLIGHT: 12 CHIP WHITE LED 6S2P
VF =16.2~20.4V; IF = 40mA
3. OPERATING TEMP: -20°C~+70°C
4. STORAGE TEMP: -30°C~+80°C
5. LCD IC:
6. Luminance:800 cd/m2(TYP) 700 cd/m2(MIN)
7. "(" Reference dimension, "*"critical dimension
8. RoHS Compliant

REV.	DATE	MODIFICATION
1.0	2023.7.4	Update CTP-FPC length
	2023.6.27	First issue

INTERFACE	RGB Interface
	FPC Connector (FH12-40S-0.5SH)
VIEWING DIRECTION	FREE
Gray DIRECTION	

PIN	SYMBLE
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	NC
33	NC
34	DE
35	NC
36	GND
37	XR(NC)
38	YD(NC)
39	XL(NC)
40	YU(NC)

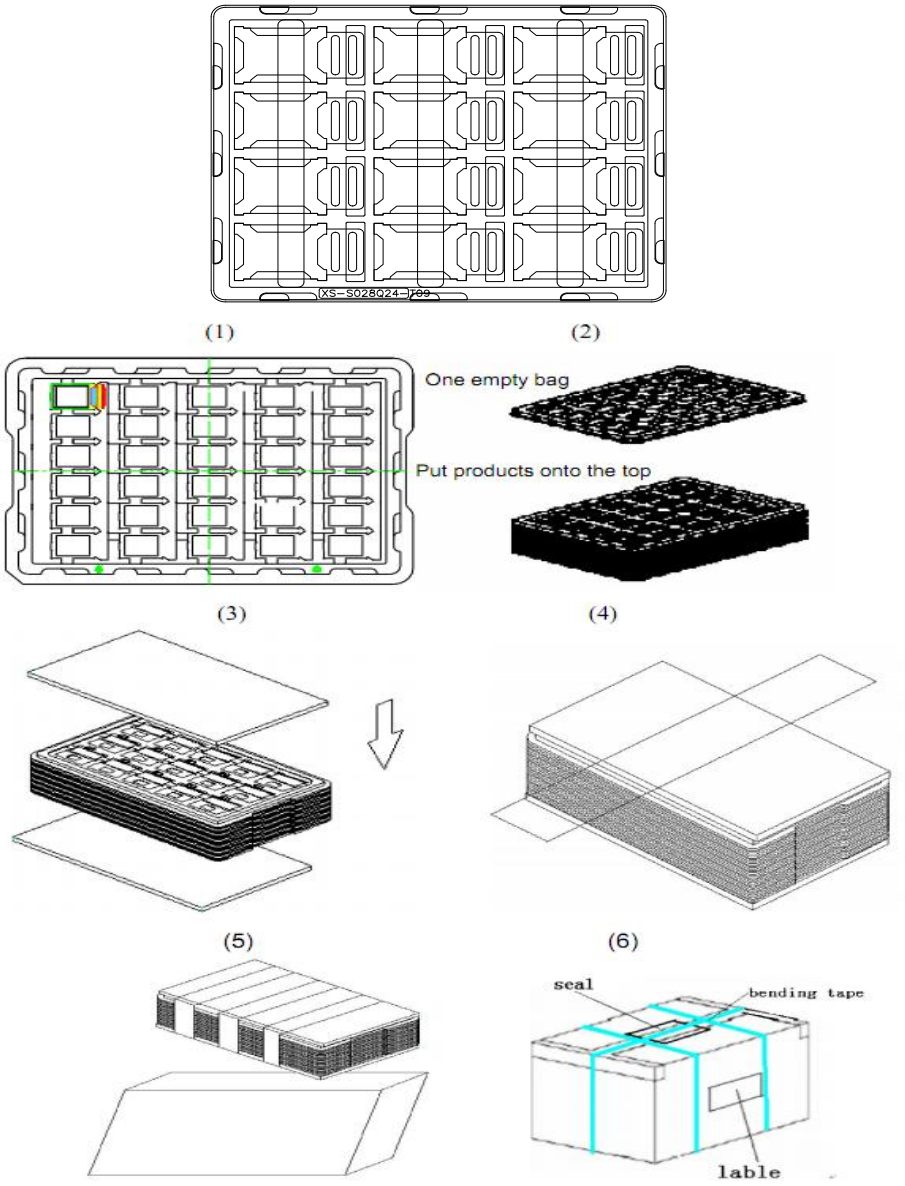
LCM PIN

PCAP PIN	
1	GND
2	VDD-3.3V
3	SCL-3.3V
4	GND
5	SDA-3.3V
6	GND
7	RST
8	NC
9	INT-3.3V
10	GND

Material code:		PART NO.	S043HWV104EN-FC83
DWN	LHF 2023.7.4	REV.	V1.0
CHKD	Li Huang 2023.7.4	SHEET OF	1/1
PROJECTION	3rd ANGLE	TOLERANCE UNLESS SPECIFIED	±0.3
UNIT	mm	SCALE	1:1

9. Packing

Packing Method



Steps:

1. Put module into tray cavity
2. Tray stacking
3. Put 1 cardboard under the tray stack and 1 cardboard above
4. Fix the cardboard to the tray stack with adhesive tape
5. Put the tray stack into carton
6. Carton sealing with adhesive tape

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
- Ketene
- 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

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