PRODUCT SPECIFICATION

CDTECH Model: **S050BWV127EP-FL102-AG**

CUSTOMER Model: -

Description: **5.0” TFT-LCD Module with LENS**

Version: **1.0**

CDTECH	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
DATE	2026.10.08	2026.10.08	2026.10.08

CUSTOMER APPROVAL	SIGNATURE	DATE

Record of Revisions

Version	Revise Date	Description	Page
1.0	2026-10-08	First Release	-

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1. General Specifications

1.1 LCM General Information

Item	Specification	Unit
LCD Size	5.0	inch
Number of Pixels	800 (H) RGB x 480 (V)	pixels
Display Mode	Normally Black	-
Viewing Direction	Free	o' clock
Interface	RGB	-
Display Colors	16.7M	colors
Outline Dimension	120.70(H) x 75.80 (V) x 9.95 (D)	mm
Active Area	108.00 (H) x 64.80 (V)	mm
Pixel Pitch	0.135 (H) x 0.135 (V)	mm
Driver IC	ST72568	-
Operation Temperature	-30~85	℃
Storage Temperature	-30~85	℃

Note1:Requirements on Environmental Protection: RoHS Compliant

2. Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Note
Analog Supply voltage	VDD	-0.3	4.0	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. Electrical Characteristics

3.1 Recommended Operating Condition for TFT LCD

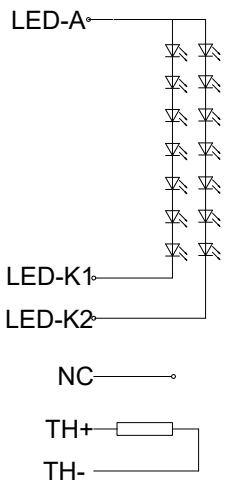
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Analog Supply voltage	VDD	3.1	3.3	3.6	V	
Analog supply current	I_{VDD}	-	75	115	mA	VDD=3.3V （GREEN)
Logic input voltage	VIH	0.7*VDD	-	VDD	V	
	VIL	GND	-	0.3*VDD	V	

3.2 Recommended Driving Condition for Backlight

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Driving Current	I_F	-	140	-	mA	
Driving Voltage	V_F	18.9	-	23.8	V	
Power consumption	W_{BL}	2.646	-	3.332	W	
LED Life-Time	N/A	-	50000	-	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 :



4. Interface Pin Assignment

4.1 LCM Pin Assignment

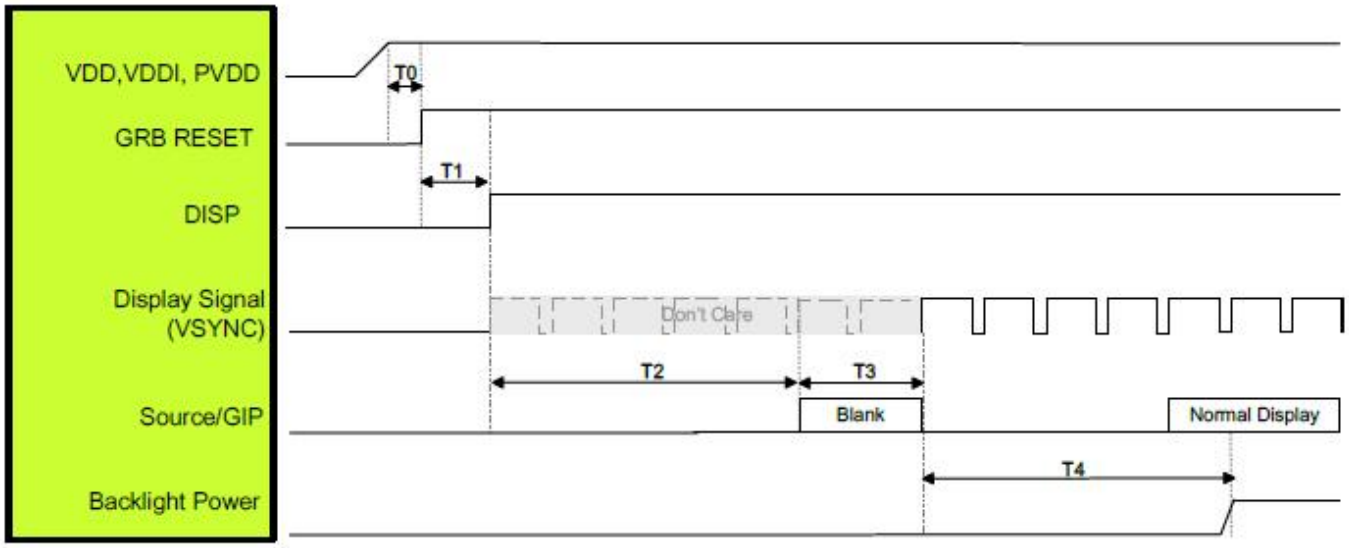
<table>
<tr><th>No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>1</td><td>VLED-</td><td>Power for LED backight (Cathode)</td></tr>
<tr><td>2</td><td>VLED+</td><td>Power for LED backlight (Anode)</td></tr>
<tr><td>3</td><td>GND</td><td>Grounds</td></tr>
<tr><td>4</td><td>VDD</td><td>Power Supply</td></tr>
<tr><td>5~12</td><td>R0~R7</td><td>RGB data</td></tr>
<tr><td>13~20</td><td>G0~G7</td><td>RGB data</td></tr>
<tr><td>21~28</td><td>B0~B7</td><td>RGB data</td></tr>
<tr><td>29</td><td>GND</td><td>Ground</td></tr>
<tr><td>30</td><td>DCLK</td><td>Pixel clock input.</td></tr>
<tr><td>31</td><td>DISP</td><td>DISP sets the display mode.
<table>
<tr><th>DISP</th><th>Function Description</th></tr>
<tr><td>L</td><td>Standby mode(Default)</td></tr>
<tr><td>H</td><td>Normal display mode</td></tr>
</table></td></tr>
<tr><td>32</td><td>HSYNC</td><td>Horizontal sync signal.</td></tr>
<tr><td>33</td><td>VSYNC</td><td>Vertical sync signal.</td></tr>
<tr><td>34</td><td>DE</td><td>Data input enable</td></tr>
<tr><td>35</td><td>NC</td><td>No connection</td></tr>
<tr><td>36</td><td>GND</td><td>Ground</td></tr>
<tr><td>37</td><td>NC</td><td>No connection</td></tr>
<tr><td>38</td><td>NC</td><td>No connection</td></tr>
<tr><td>39</td><td>NC/TH+</td><td>Thermistor pin1</td></tr>
<tr><td>40</td><td>NC/TH-</td><td>Thermistor pin2</td></tr>
</table>

5. Interface Characteristics

5.1 Power on/off sequence

Power On Sequence

Power Mode



Symbol	Description	Time	Unit
T0	System power stability to GRB RESET signal	≥1	ms
T1	GRB RESET= "High" to DISP="High"	≥10	ms
T2	DISP="High" to Source/GIP scan blank	85	ms
T3	IC scan blanking signal	≥33	ms
T4	Display signal input to Backlight power on (base on Display Signal Frame Rate 60Hz)	≥100	ms

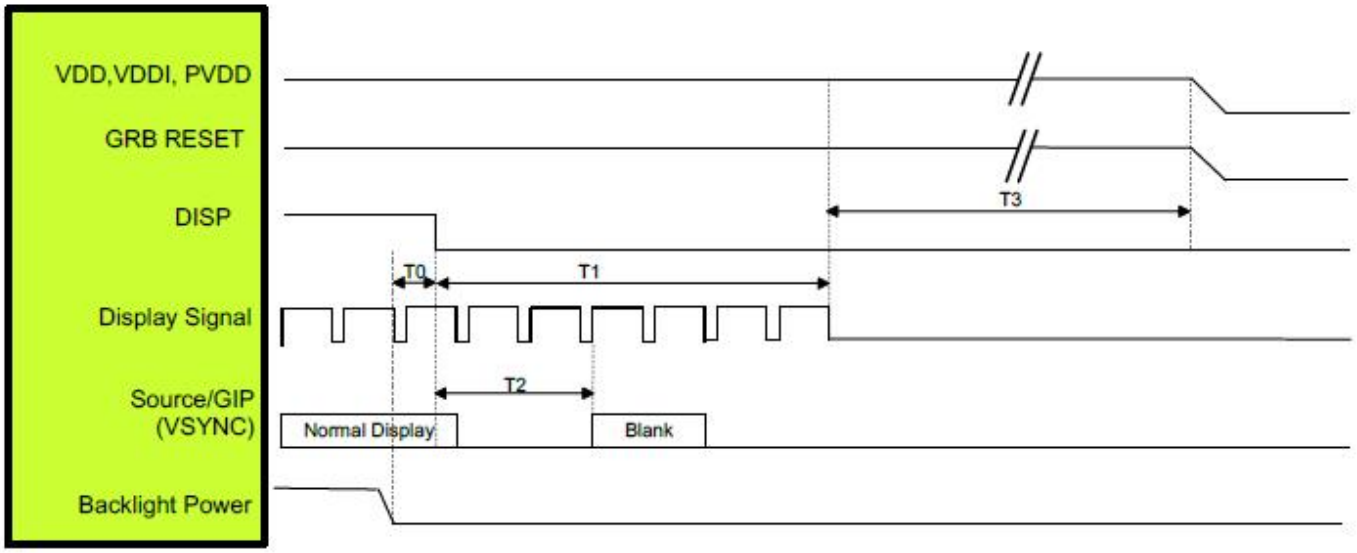
Note: 1. When DISP pull "H" or "L", IC will execute the internal power on or power off procedures .Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.

2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0].

3. LVDS interface Display signal: DCLK P/N; RX[3:0] P/N

Power Off Sequence

Power Mode



Symbol	Description	Time	Unit
T0	Backlight Power off to DISP="Low"	≥1	ms
T1	DISP="Low" to IC internal voltage discharge complete	≥100	ms
T2	DISP="Low" to Source/GIP scan blank (base on Display Signal Frame Rate 60Hz)	≤50	ms
T3	IC internal voltage discharge is completed to VDD/VDDI/PVDD off	≥0	ms

Note: 1. When DISP pull "H" or "L", IC will execute the internal power on or power off procedures .Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.

2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0].

3. LVDS interface Display signal: DCLK P/N; RX[3:0] P/N.

5.2 DC Characteristics

DC Characteristics for Digital Circuit

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Logic-High Input Voltage	Vih	0.7VDDI	-	VDDI	V	
Logic-Low Input Voltage	Vil	DGND	-	0.3VDDI	V	
Logic-High Output Voltage	Voh	VDDI-0.4	-	VDDI	V	
Logic-Low Output Voltage	Vol	DGND	-	DGND+0.4	V	

DC Characteristics for Analog Circuit

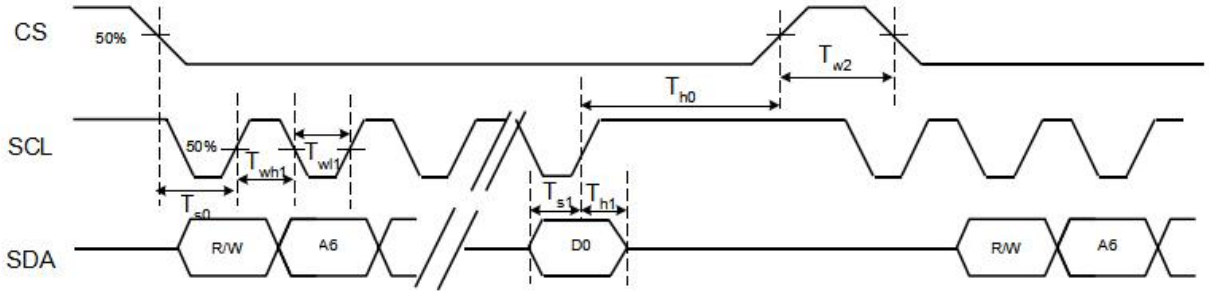
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Positive High-Voltage Power	VGHS	9	15	17	V	No Load@ FR=60Hz
Negative High-Voltage Power	VGL	-11.5	-10.5	-7	V	
Output Voltage Deviation	Vod	-	±40	±50	mV	
Standby Current	Isc	-	-	50	uA	
Operation Current	Ioc	-	40	-	mA	

5.3 AC Characteristics

System Operation AC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
VDD Power Source Slew Time	TPOR	-	-	20	ms	From 0V to 99% VDD
GRB Pulse Width	tRSTW	10	50	-	us	R=10Kohm, C=1uF
SD Output Stable Time	Tst	-	-	12	us	Output settled within +20mV Loading = 6.8k+28.2pF.
GD Output Rise and Fall Time	Tgst	-	-	6	us	Output settled (5%~95%), Loading = 4.7k+29.8pF

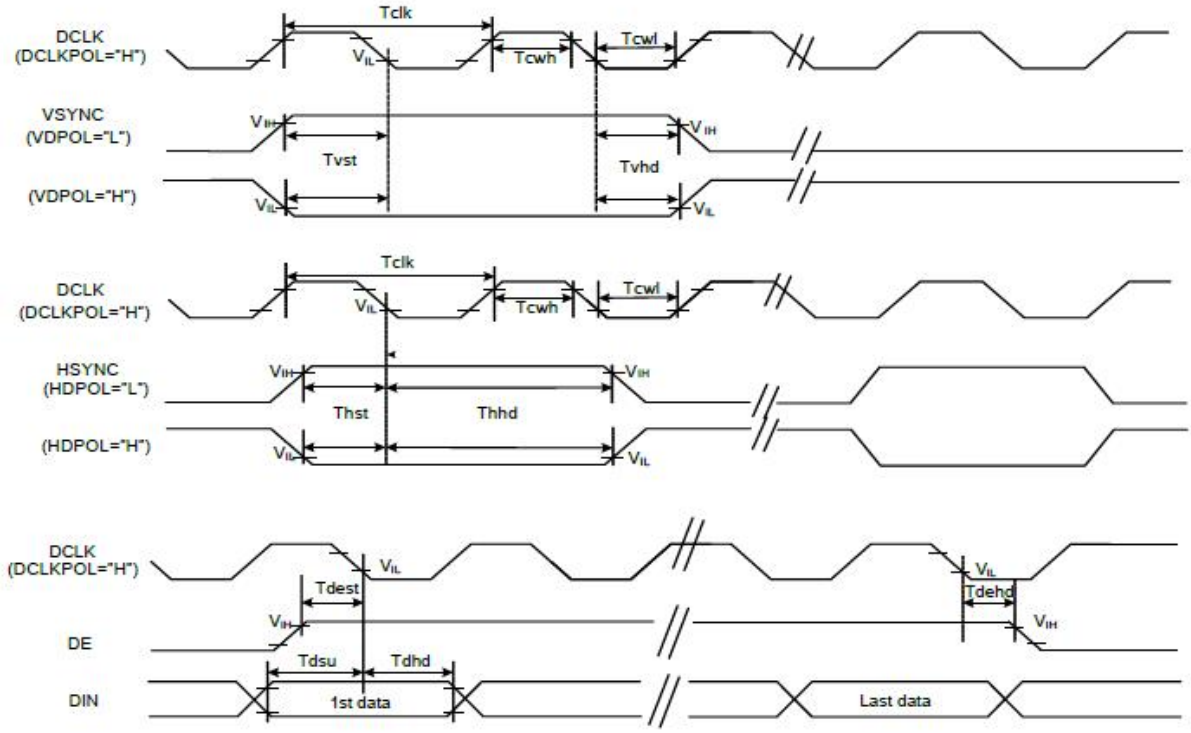
System Bus Timing for 3-Wire SPI Interface



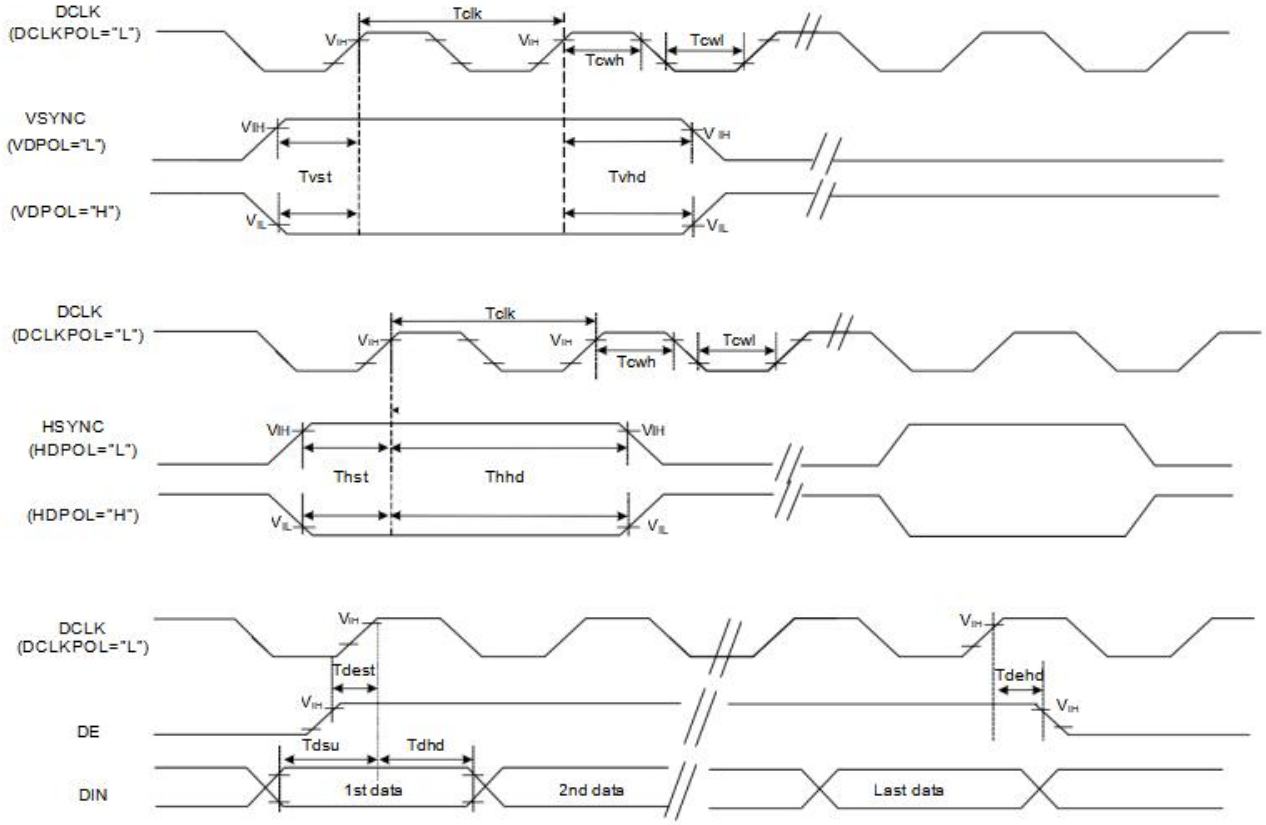
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CS Input Setup Time	T_{s0}	50	-	-	ns	
Serial Data Input Setup Time	T_{s1}	50	-	-	ns	
CS Input Hold Time	T_{h0}	50	-	-	ns	
Serial Data Input Hold Time	T_{h1}	50	-	-	ns	
SCL Write Pulse High Width	T_{wh1}	50	-	2000	ns	
SCL Write Pulse Low Width	T_{wl1}	50	-	2000	ns	
SCL Read Pulse High Width	T_{rh1}	300	-	2000	ns	
SCL Read Pulse Low Width	T_{rl1}	300	-	2000	ns	
CS Pulse High Width	T_{w2}	400	-	-	ns	

System Bus Timing for RGB Interface

DCLK Neagtive Polarity (DCLPOL="H")



DCLK Positive Polarity (DCLPOL="L")

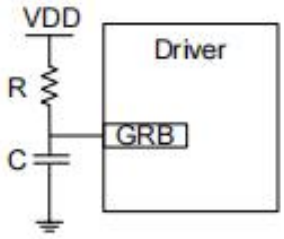


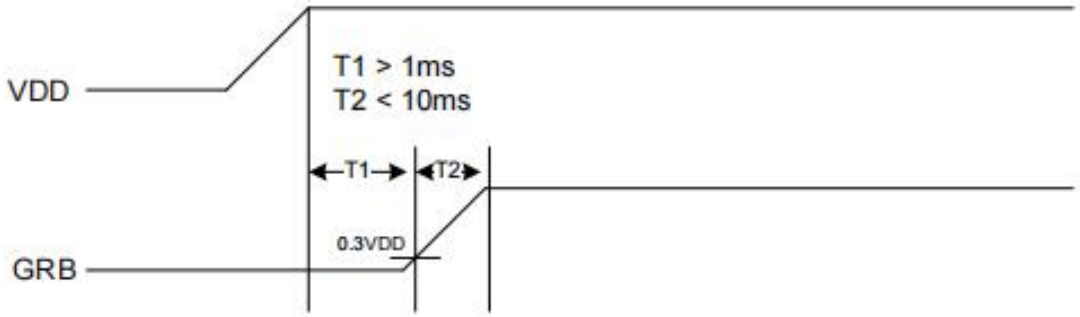
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tcw	40	50	60	%	
VSYNC Setup Time	Tvst	10	-	-	ns	
VSYNC Hold Time	Tvhd	10	-	-	ns	
HSYNC Setup Time	Thst	10	-	-	ns	
HSYNC Hold Time	Thhd	10	-	-	ns	
Data Setup Time	Tdsu	10	-	-	ns	
Data Hold Time	Tdhd	10	-	-	ns	
DE Setup Time	Tdest	10	-	-	ns	
DE Hold Time	Tdehd	10	-	-	ns	

5.4 Reset Timing

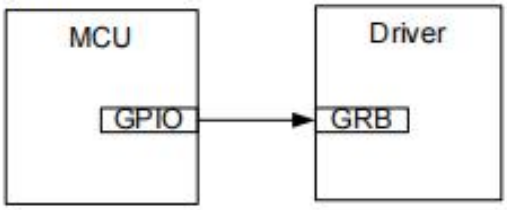
Setting GRB pin to "L" (hardware reset) can initialize internal function. Initialized by GRB pin is essential before operating. There are two suggestions for hardware reset connection.

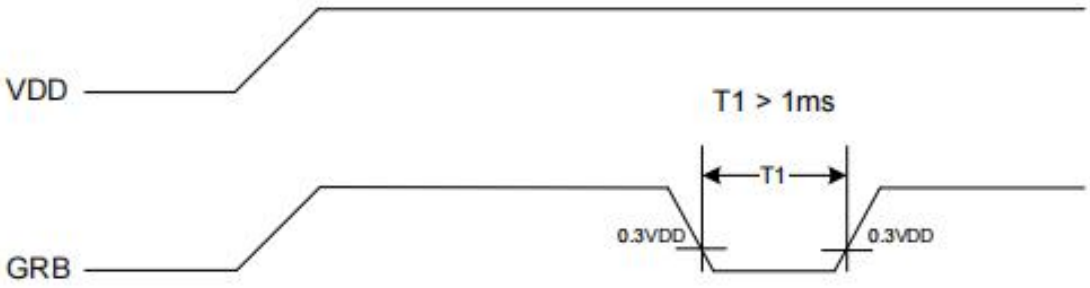
(1) The GRB pin with external RC circuit.





(2) The GRB pin controlled by MCU.



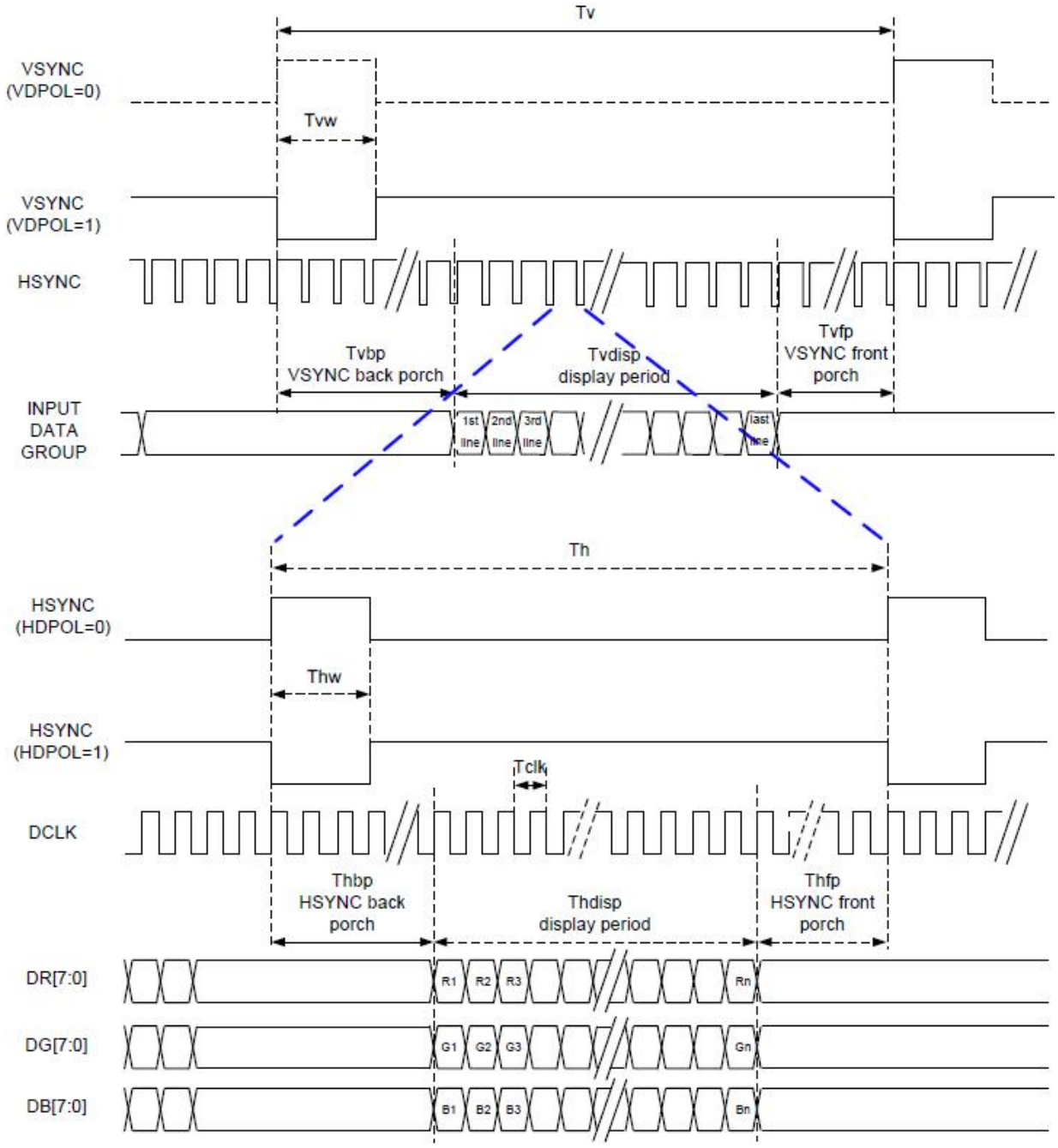


5.5 RGB interface

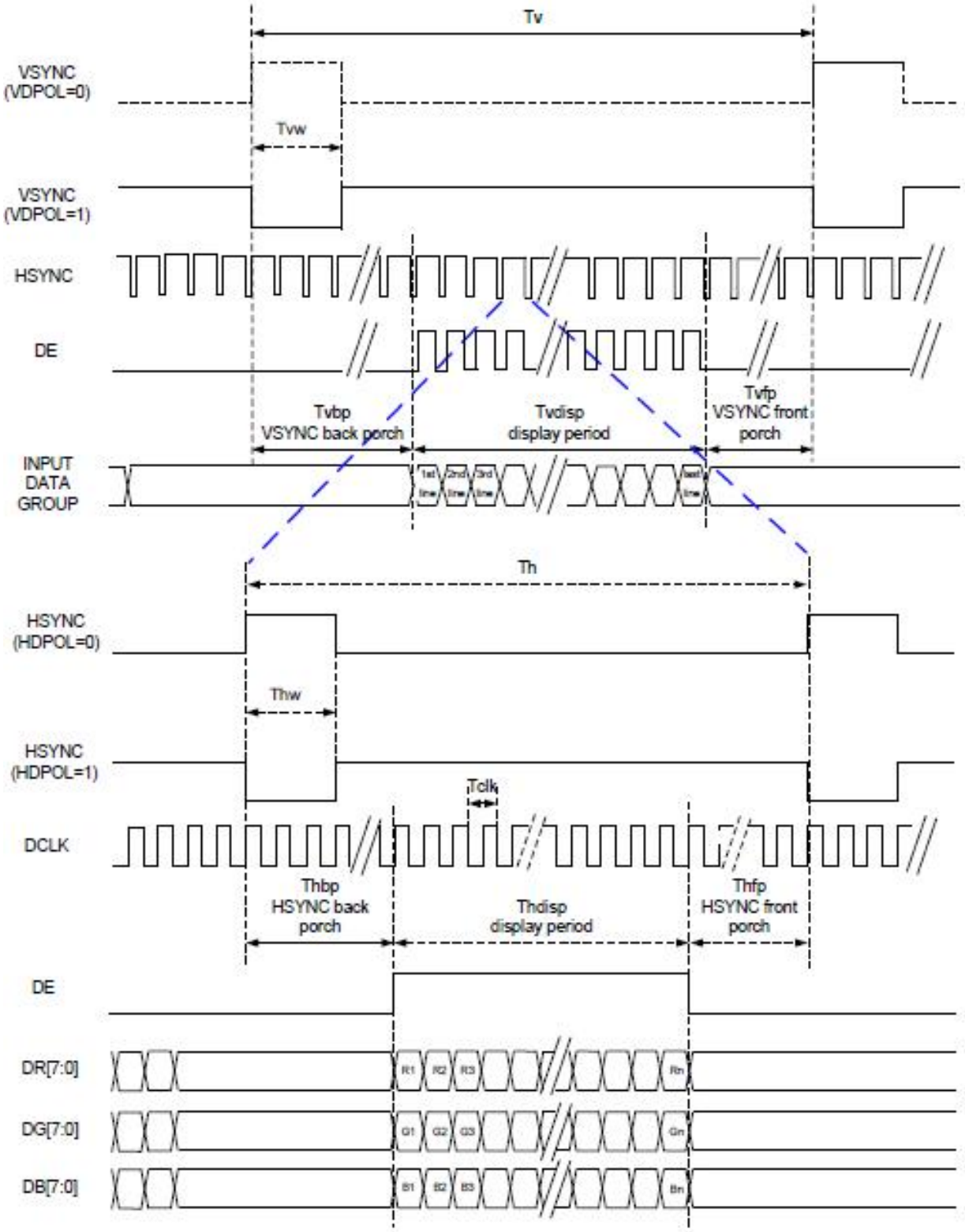
RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

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

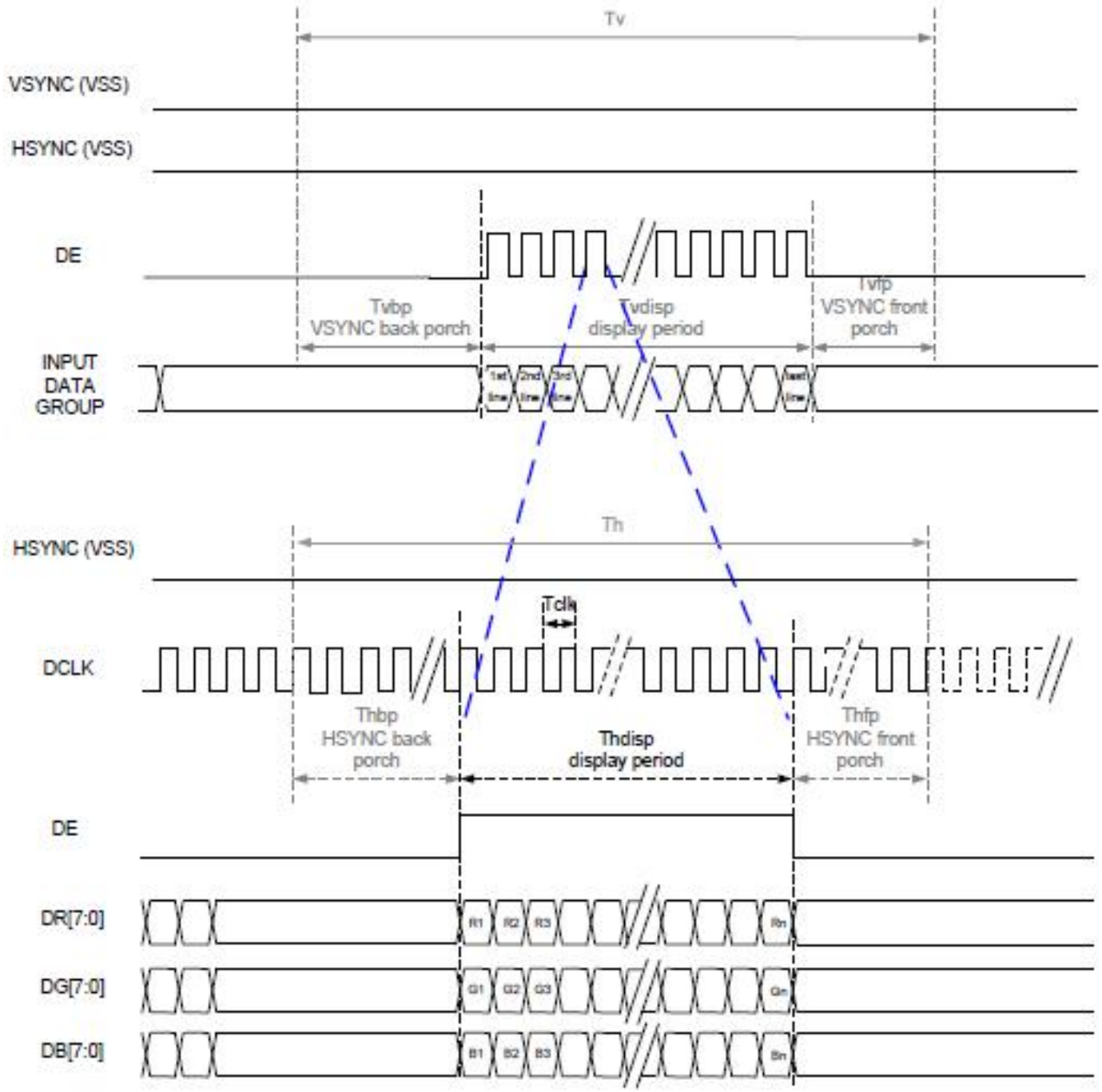
SYNC Mode



SYNC-DE Mode


Tv
VSYNC (VDPOL=0)
Tvw
VSYNC (VDPOL=1)
HSYNC
DE
Tvbp VSYNC back porch
Tvdisp display period
Tvfp VSYNC front porch
INPUT DATA GROUP
Th
HSYNC (HDPOL=0)
Thw
HSYNC (HDPOL=1)
Tclk
DCLK
Thbp HSYNC back porch
Thdisp display period
Thfp HSYNC front porch
DE
DR[7:0]
DG[7:0]
DB[7:0]

DE Mode


Tv
VSYNC (VSS)
HSYNC (VSS)
DE
Tvbp
VSYNC back porch
Tvdisp
display period
Tvfp
VSYNC front
porch
INPUT
DATA
GROUP
HSYNC (VSS)
Th
Tclk
DCLK
Thbp
HSYNC back
porch
Thdisp
display period
Thfp
HSYNC front
porch
DE
DR[7:0]
DG[7:0]
DB[7:0]

Parallel 24-bit RGB Input Timing Table

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	808	816	848	DCLK	
	Display Period	Thdisp		800		DCLK	
	Back Porch	Thbp	4	8	24	DCLK	
	Front Porch	Thfp	4	8	24	DCLK	
	Pulse Width	Thw	2	4	8	DCLK	
VSYNC	Period Time	Tv	496	512	528	HSYNC	
	Display Period	Tvdisp		480		HSYNC	
	Back Porch	Tvbp	8	16	24	HSYNC	
	Front Porch	Tvfp	8	16	24	HSYNC	
	Pulse Width	Tvw	2	4	8	HSYNC	

Note: 1. The minimum blanking time depends on the GIP timing of the panel specification

2. To ensure the compatibility of different panels, it is recommended to use the typical setting.

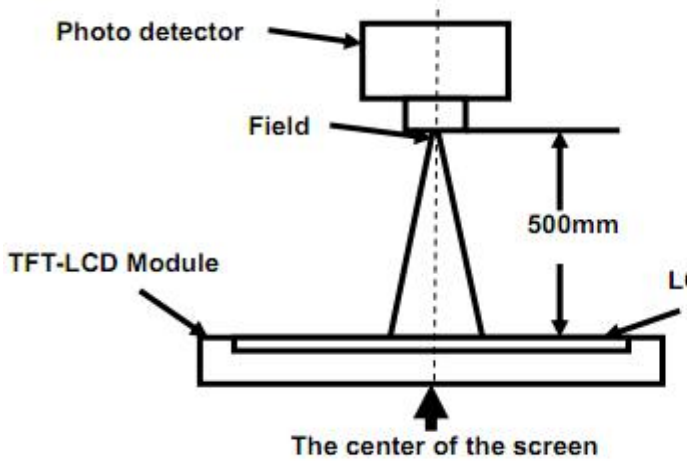
3. It is necessary to keep Tvbp =16 and Thbp =8 in sync mode. DE mode is unnecessary to keep it.

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		1000	1200	-	-	Note1 Note3
Color Chromaticity	W_X		0.2811	0.3111	0.3411	-	Note1 Note5
	W_Y		0.3139	0.3439	0.3739	-	Note1 Note5
Luminance	L		800	1000	-	cd/m²	Note1 Note7
Luminance Uniformity	Y_U		75	80	-	%	Note1 Note6
NTSC	-		50	55	-	%	-

Note 1:Definition of optical measurement system.

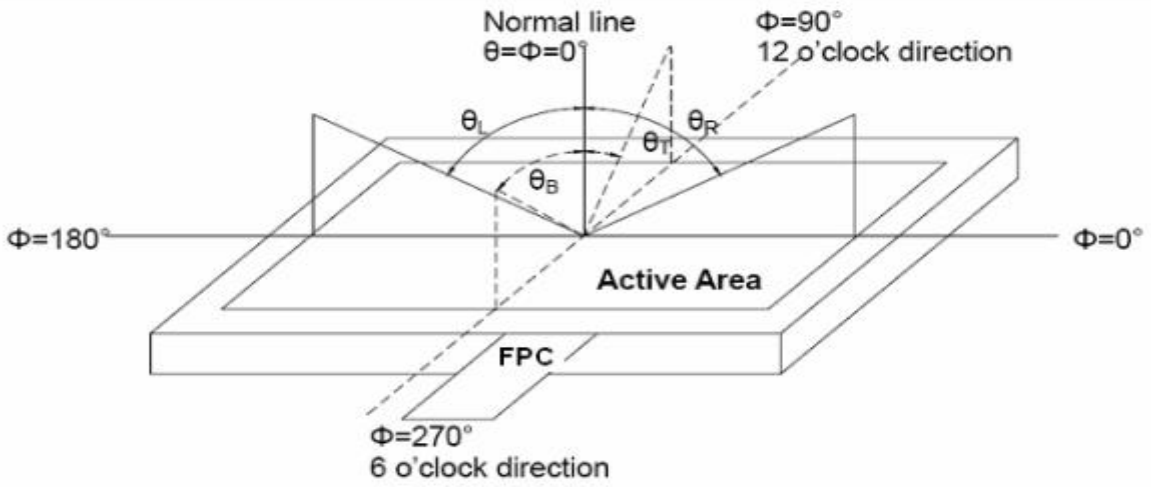
The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



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

Fig 1

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).

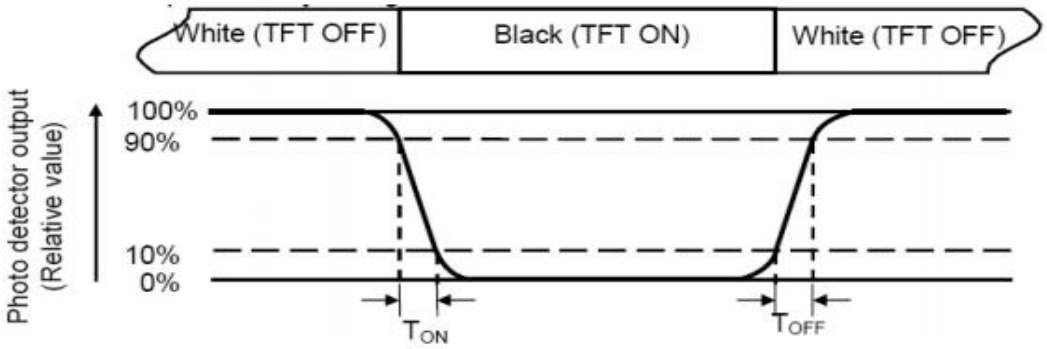


Note 3: Definition of contrast ratio

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

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.3-a/b

Note 7:Surface luminance is the luminance with all pixels displaying white.

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

For more information see FIG.3-a/b

Note 8:

H,V : Active area(see Figure a)
Light spot size ⌀ =5mm(BM-5) or ∅=7.7mm (BM-7)50cm distance or test spot position : see Figure a.
measurement instrument : TOPCON's luminance meter SR-3A or BM-7 or compatible (see Figure 1).

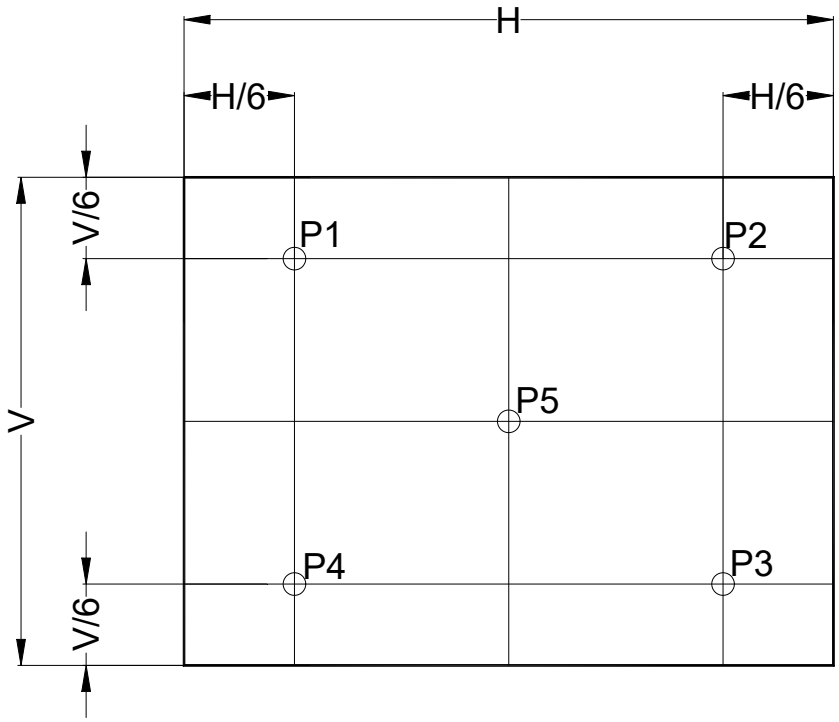


Fig. 3-a Definition of points

7. Reliability Test Items

Test Item	Test Conditions	
High Temperature Storage	Ta= +85℃	96hrs
Low Temperature Storage	Ta= -30℃	96hrs
High Temperature Operation	Ta= +85℃	96hrs
Low Temperature Operation	Ta= -30℃	96hrs
High Temperature and Humidity Operation	Ta= +60℃, 90% RH	96hrs
Thermal Shock (Non-operation)	-30℃/30 min ~ +85℃/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:

1. 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:

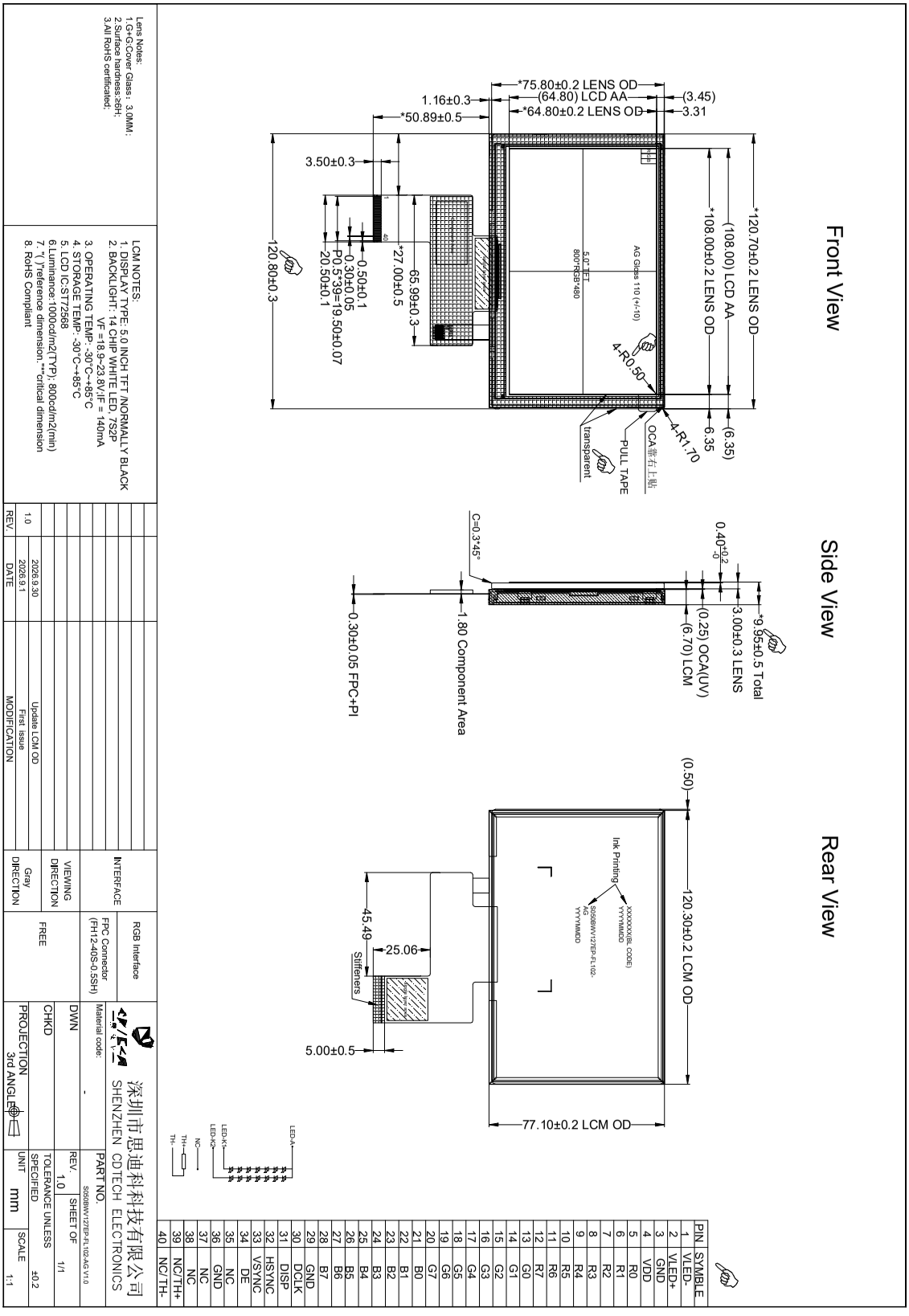
1).Air bubble in the LCD;

2).Seal leak or Glass crack

3).Non display or abnormal display

4).Brightness reduction >50%

8. Mechanical Drawing



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	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC/TH+
40	NC/TH-

Lens Notes:
1.G+G:Cover Glass：3.0MM；
2.Surface hardness:≥6H;
3.All RoHS certificated;

LCM NOTES:
1. DISPLAY TYPE: 5.0 INCH TFT /NORMALLY BLACK
2. BACKLIGHT: 14 CHIP WHITE LED: 7S2P
VF =18.9~23.8V,IF = 140mA
3. OPERATING TEMP: -30°C~+85°C
4. STORAGE TEMP: -30°C~+85°C
5. LCD IC:ST72568
6.Luminance:1000cd/m2(TYP); 800cd/m2(min)
7. "()"reference dimension,"*"critical dimension
8. RoHS Compliant

REV.	DATE	MODIFICATION
1.0	2026.9.30	Update LCM OD
	2026.9.1	First issue

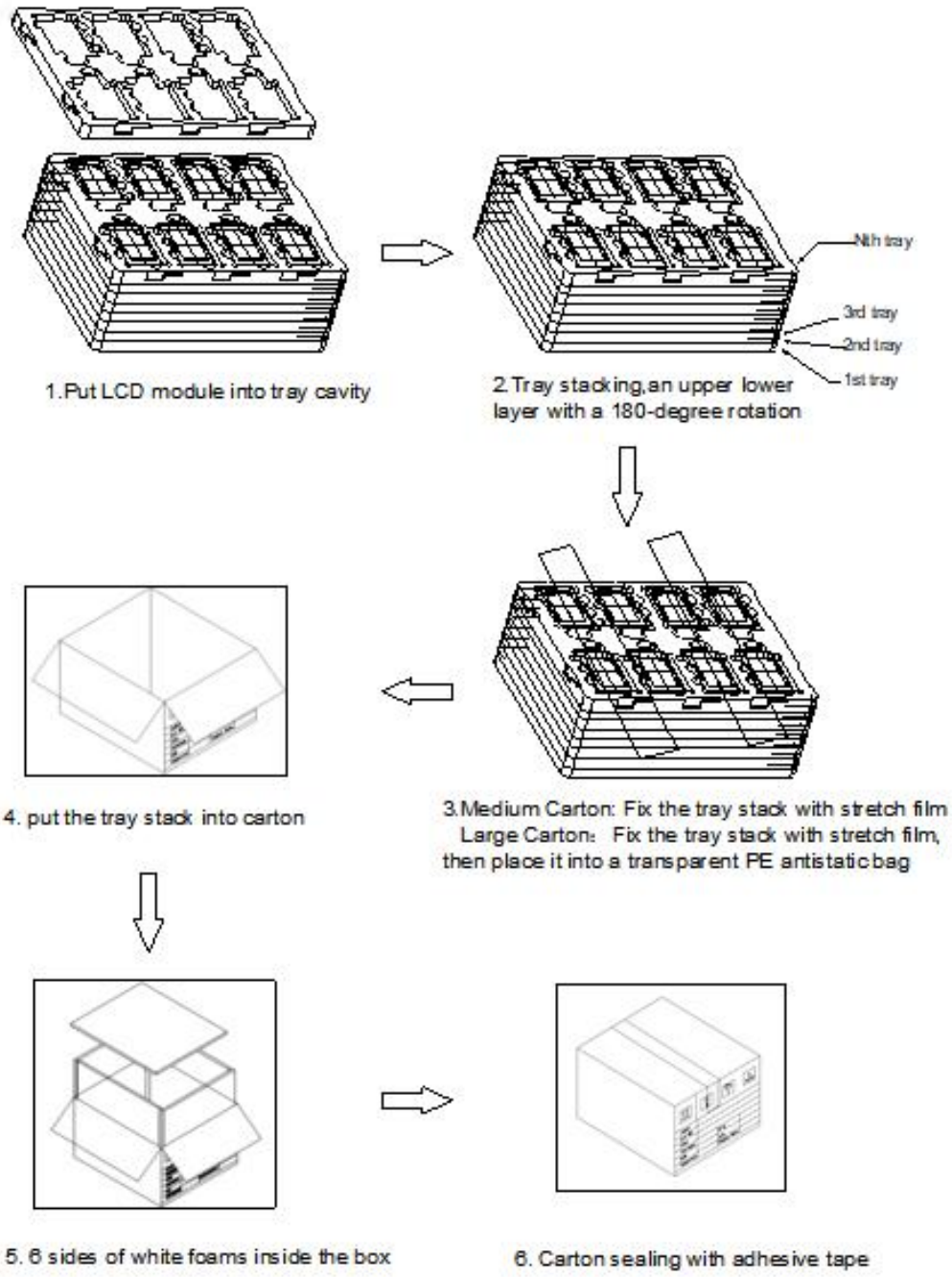
INTERFACE	RGB Interface
	FPC Connector (FH12-40S-0.5SH)
VIEWING DIRECTION	FREE
Gray DIRECTION	

深圳市思迪科技有限公司
SHENZHEN CDTECH ELECTRONICS

Material code:	-	PART NO.	S050BWY12TEP-FL102-AG V1.0
DWN		REV.	1.0
CHKD		SHEET OF	1/1
PROJECTION 3rd ANGLE		TOLERANCE UNLESS SPECIFIED	±0.2
UNIT	mm	SCALE	1:1

9. Packing

Packing Method



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.

10.4 Packaging instructions

When the customers using trays, they have to stack the adjacent trays in a 180° staggered to prevent pressure that could cause product damage.