Product Specifications

Customer	
Model Name	GDS050WV02
Description	Standard LCD Module 800(RGB)x480 Dots 5.0" TFT LCD
Date	2013/3/1
Revision	2.0

Engineering			
Check	**Date**	**Prepared**	**Date**
	2013/3/1		2013/3/1

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1. Record of Revision

Rev	Issued Date	Description	Editor
1.1	2011/06/21	First Release.	Richard Liang
1.2	2011/11/17	Update drawing	Richard Liang
2.0	2013/3/1	Update the Outline Dimension	LI TANG

2. General Specifications

Feature		Spec
Characteristics	Size	5.0inch
	Resolution	800(horizontal)*480(Vertical)
	Interface	RGB-24bit
	Connect type	Connector
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	0.135 x 0.135
	Pixel Configuration	R.G.B. Vertical Stripe
	Display Mode	Normally White
	Driver IC	HX8264-D+HX8664-B
	Surface Treatment	3H
	Viewing Direction	6 O'clock
Mechanical	LCM (W x H x D) (mm)	120.7*76.3*3.1
	Active Area(mm)	108.00 x 64.80
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	12 LEDs

Note 1: Viewing direction is follow the data which measured by optics equipment.
Note 2: Requirements on Environmental Protection: RoHS
Note 3: LCM weight tolerance: +/- 5%

3 .Input/Output Terminals

No.	Symbol	Description
1	VBL-	Backlight LED Cathode
2	VBL+	Backlight LED Anode.
3	GND	System Ground
4	VDD	Power supply for logic operation
5~12	R0~R7	Data bus
13~20	G0~G7	Data bus
21~28	B0~B7	Data bus
29	GND	System Ground
30	DCLK	Pixel clock signal
31	STBYB	Standby mode. STBYB="1": Normally operation. STBYB="0": Standby mode .Timing controller, source driver will turn off, all output are High-Z.
32	HSYNC	Horizontal Sync signal
33	VSYNC	Vrtical Sync signal
34	DEN	Data Enable
35	NC	No connect
36	GND	System Ground
37	XR(NC)	No connect
38	YD(NC)	No connect
39	XL(NC)	No connect
40	YU(NC)	No connect

4 .Absolute Maximum Ratings

Driving TFT LCD Panel

Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	V_{DD}	-0.5	5.0	V	
Operating Temperature	T_{OPR}	-20	70	℃	
Storage Temperature	T_{STG}	-30	80	℃	

5. Electrical Characteristics

5.1 Driving TFT LCD Panel

Ta = 25 ℃

Item		Symbol	Min	Typ	Max	Unit	Remark
Supply Voltage		VDD	3.0	3.3	3.6	V	
Input Signal Voltage	Low Level	V_{IL}	0	--	0.3xVDD	V	
	High Level	V_{IH}	0.7xVDD	--	VDD	V	
Output Signal Voltage	Low Level	V_{OL}	--	--	GND+0.4	V	
	High Level	V_{OH}	VDD-0.4	--	--	V	
(Panel+LSI) Power Consumption		Black Mode (60Hz)		TBD		mW	
		Standby Mode		TBD		mW	

5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	40		mA	
Forward Voltage	V_F		19.6		V	
Backlight Power consumption	W_{BL}	-	TBD	-	W	

Note 1: Each LED : IF =20 mA, VF =3.2V.
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.Operating life means brightness goes down to 50% initial brightness.

Typical operating life time is estimated data.

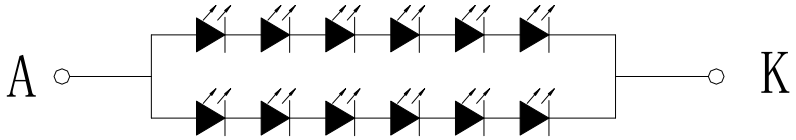
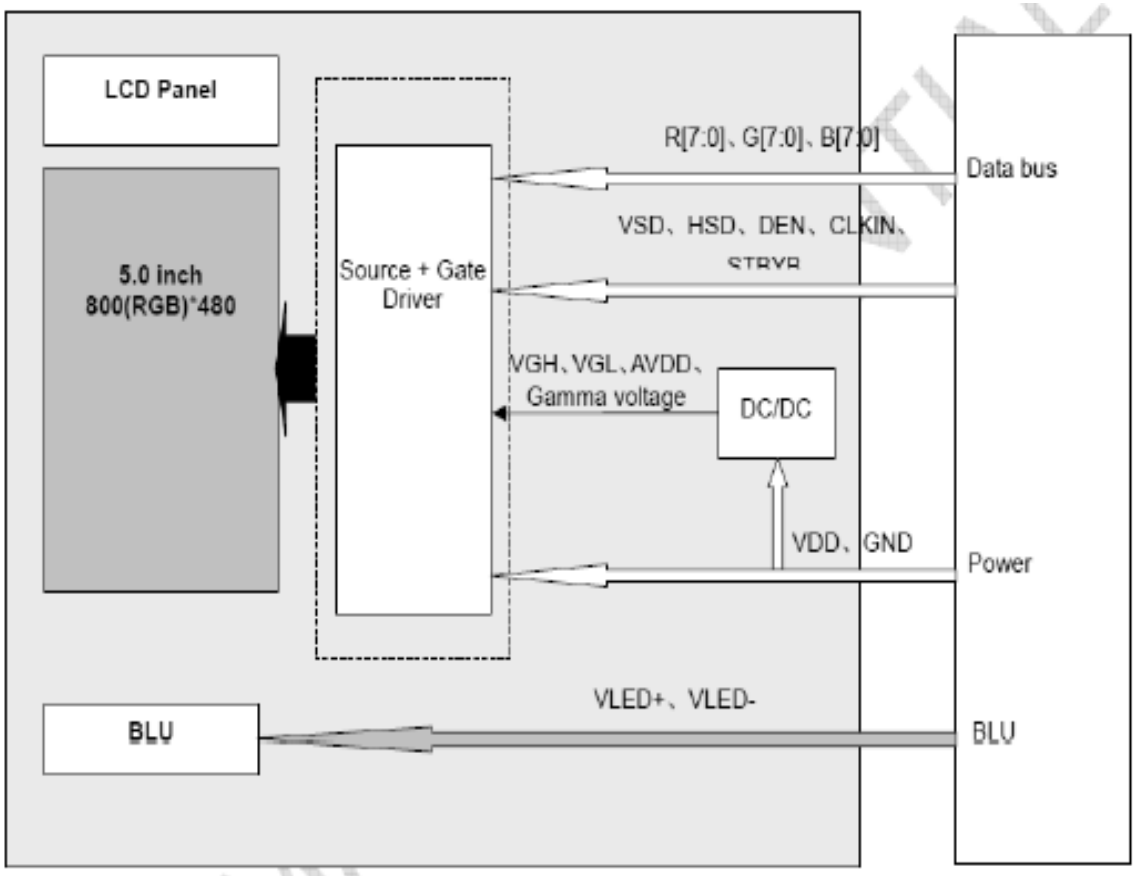


Figure : LED connection of backlight

5.3 Block Diagram



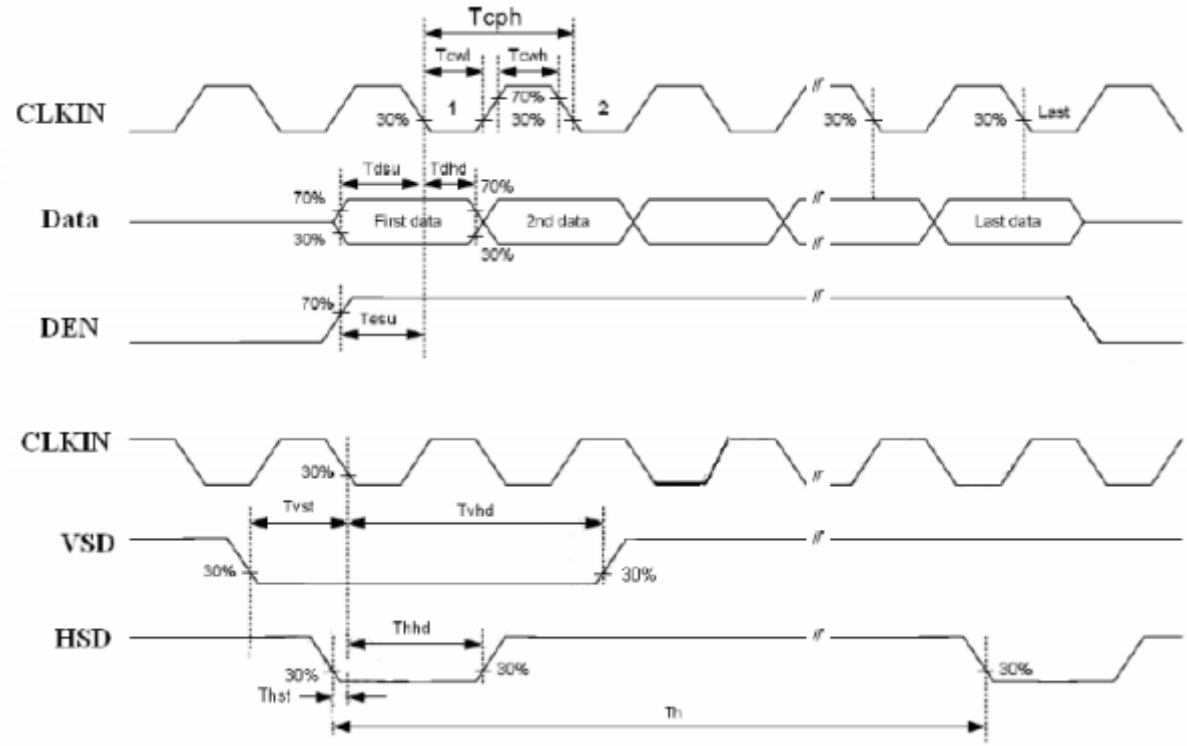
6. Interface Timing

6.1 TFT-LCD Input Timing

VCC=3.3V, AVDD=12.61V, AGND=GND=0V, Ta=25℃

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
DCLK Frequency	Fclk	-	30.0	50.0	MHz	
DCLK Cycle Time	Tcph	20	33.3	-	ns	
DCLK Pulse Width	Tcw	40%	50%	60%	Tcph	
VSD Setup Time	Tvst	8	-	-	ns	
VSD Hold Time	Tvhd	8	-	-	ns	
HSD Setup Time	Thst	8	-	-	ns	
HSD Hold Time	Thhd	8	-	-	ns	
Data Setup Time	Tdsu	8	-	-	ns	Data to DCLK
Data Hold Time	Tdhd	8	-	-	ns	Data to DCLK
DE Setup Time	Tesu	8	-	-	ns	
DE Hold Time	Tehd	8	-	-	ns	

Input Clock and Data timing Diagram:



6.2 Recommended Timing Setting of TCON

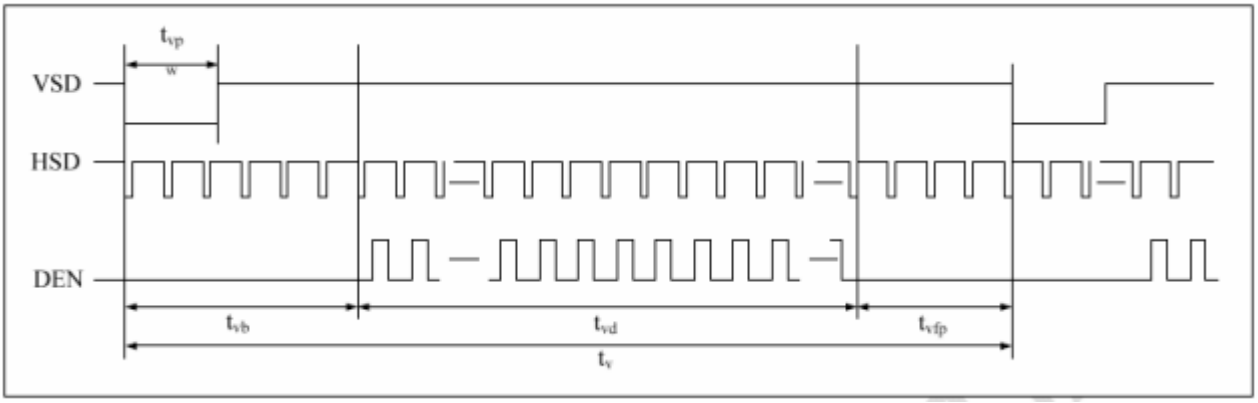
TCON (Embedded In Source IC) Input Timing (DCLK, HSD, VSD, ED)

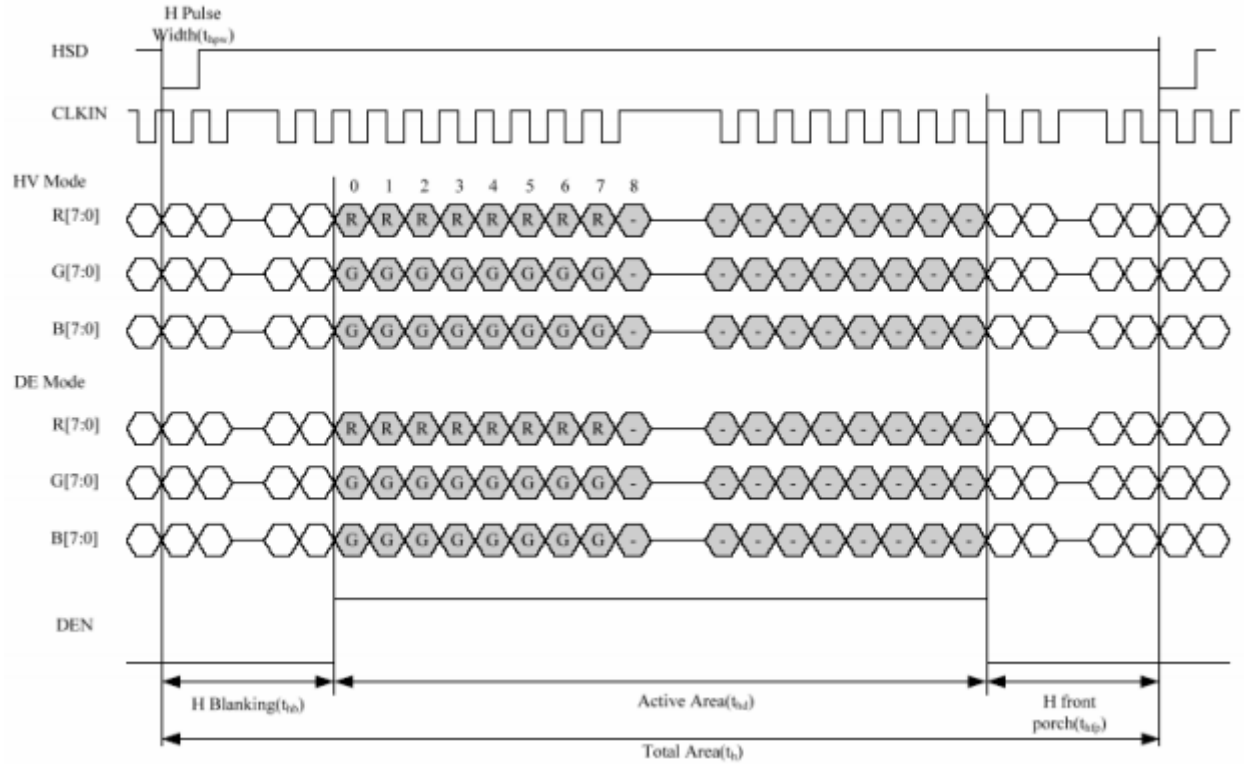
VCC=3.3V, AVDD=12.61V, AGND=GND=0V, Ta=25℃

Parameter	Symbol	Min	Typ	Max	Unit	Remark
DCLK	Fclk	-	30	50	MHZ	
	tclk	-	33.3	-	ns	
HSD	th	889	928	1143	tclk	
	thd	-	800	-	tclk	
	thpw	1	48	255	tclk	
	thb	-	88	-	tclk	
	thfp	1	40	255	tclk	
VSD	tv	513	525	767	th	
	tvd	-	480	-	th	
	tvpw	3	3	255	th	
	tvb	-	32	-	th	
	tvfp	1	13	255	th	

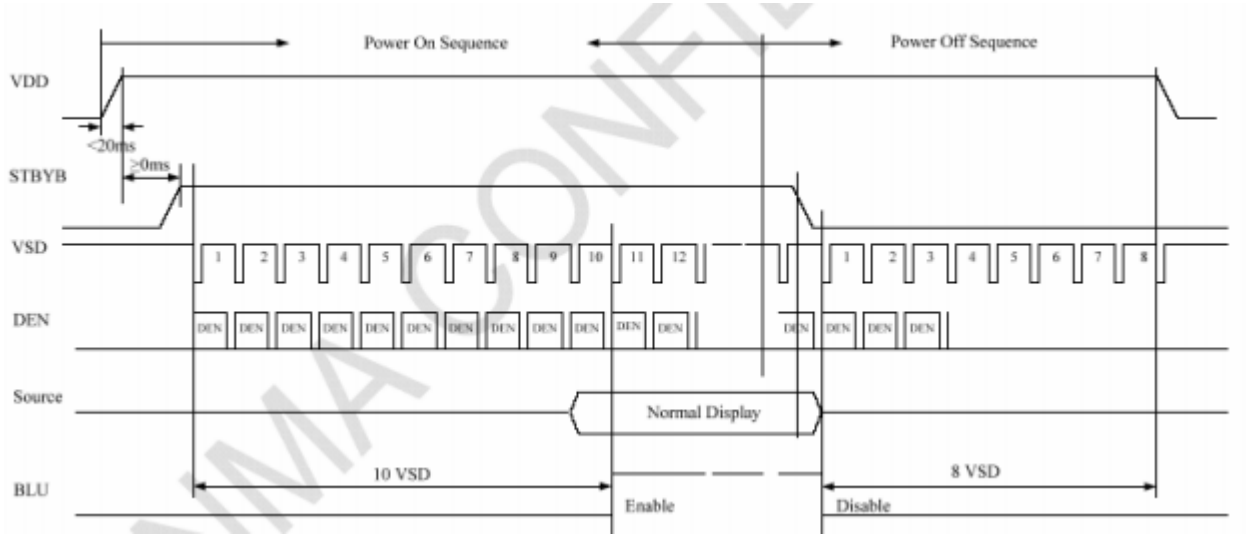
Note: DE timing refer to HSD, VSD input timing.

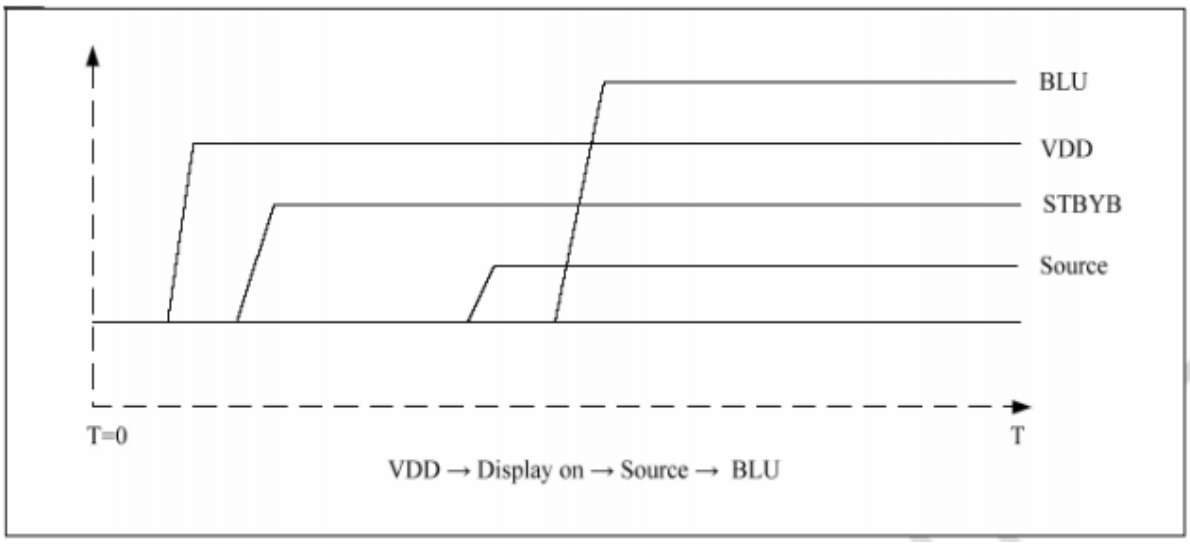
Vertical input timing Diagram:



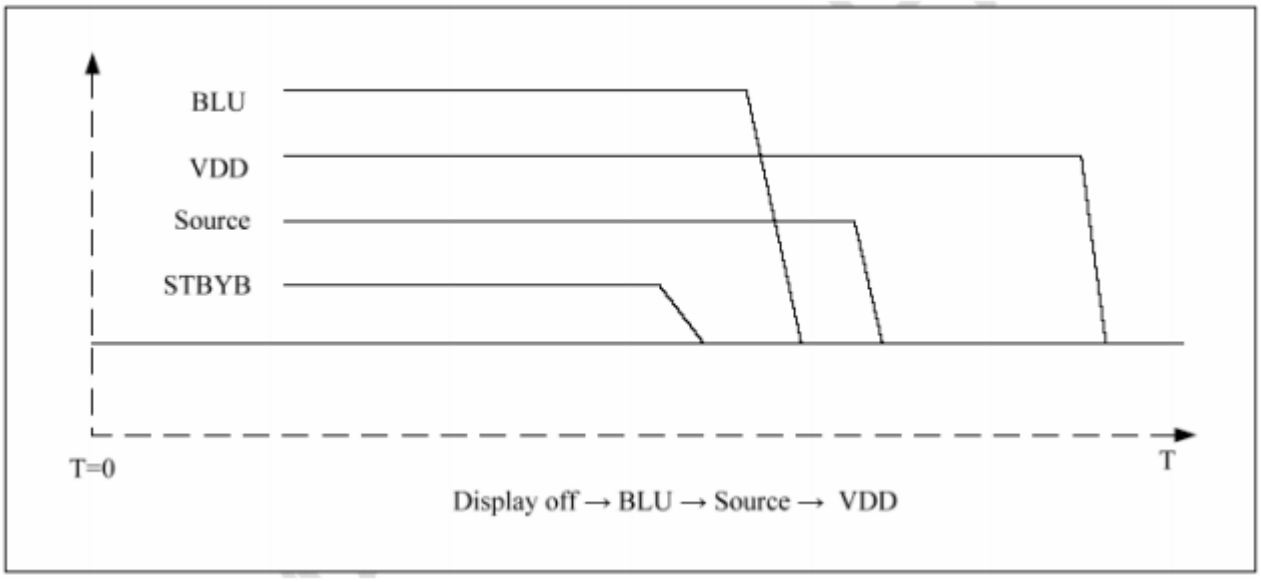


6.3 POWER ON/OFF SEQUENCE





Power On Sequence



Power Off Sequence

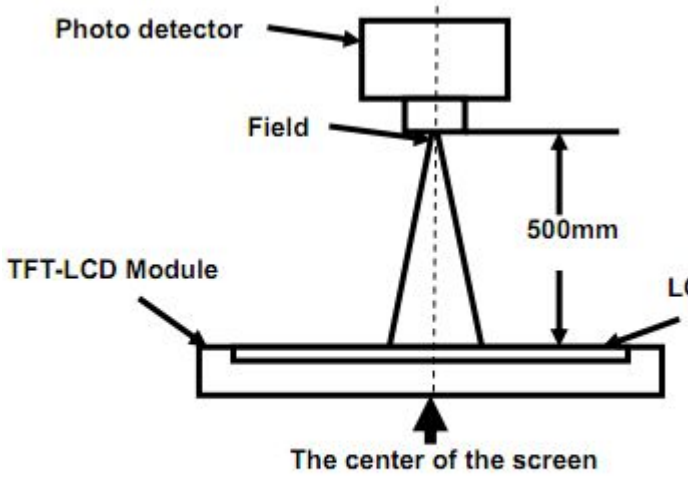
7. Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	40	50	-	Degree.	Note2
		θ_B		60	70	-		
		θ_L		60	70	-		
		θ_R		60	70	-		
Contrast Ratio		CR	Θ =0	500	600	-	-	Note1, Note3
Response Time		T_{ON}	25° C	-	20	30	ms	Note1, Note4
		T_{OFF}		-	20	30		
Chromaticity	White	X_W	Backlight is on	0.324	0.326	0.328	-	Note1, Note5
		Y_W		0.364	0.366	0.368	-	
	Red	X_R		0.611	0.613	0.615	-	
		Y_R		0.333	0.335	0.337	-	
	Green	X_G		0.305	0.307	0.309	-	
		Y_G		0.558	0.560	0.562	-	
	Blue	X_B		0.133	0.135	0.137	-	
		Y_B		0.158	0.160	0.162	-	
Uniformity		U		75	80	-	%	Note1, Note6
NTSC					50		%	Note5
Luminance		. L		300	350			Note1, Note7

Test Conditions:
1. IF= 20mA(one channel),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.



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).

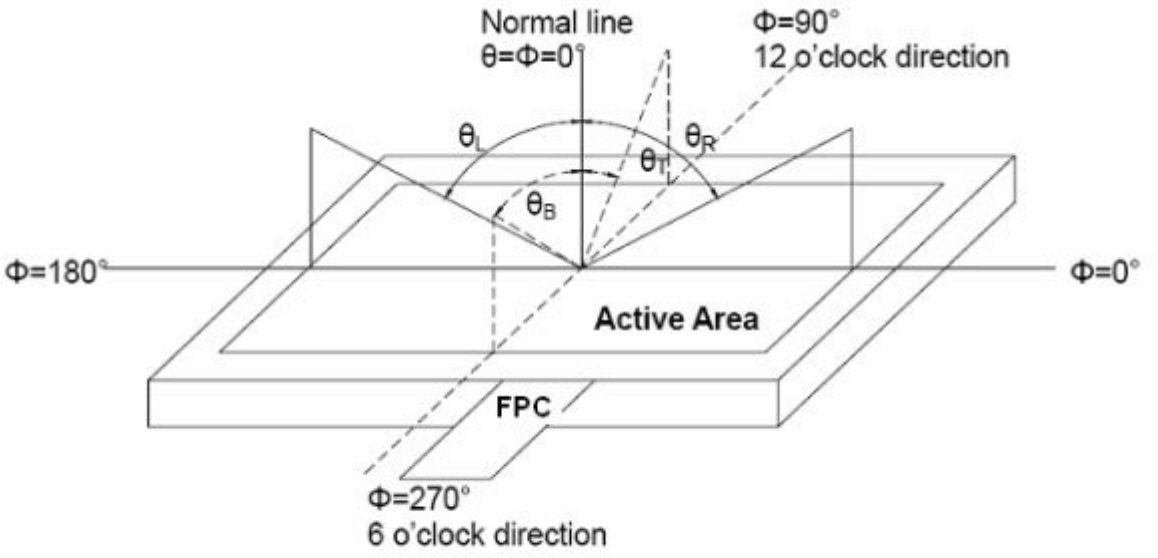


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

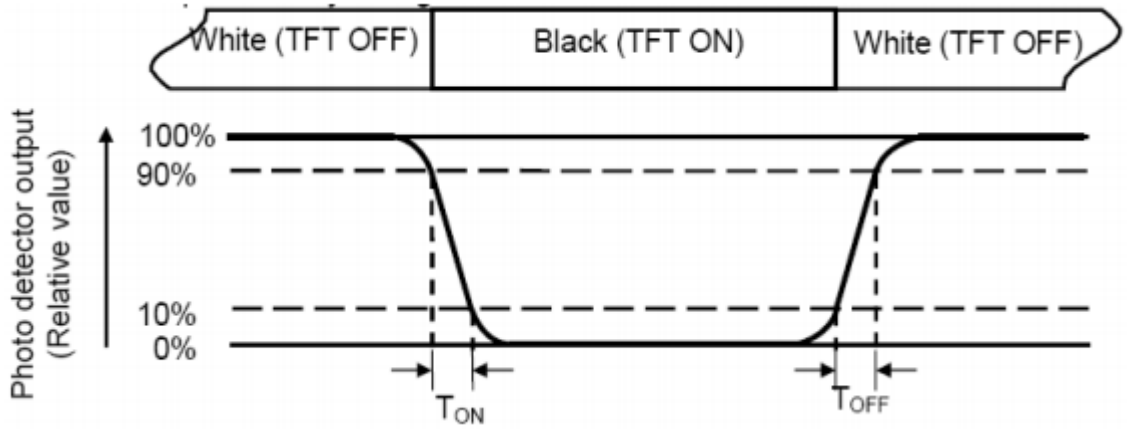
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

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

“Black state”: The state is that the LCD should driven 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 (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
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

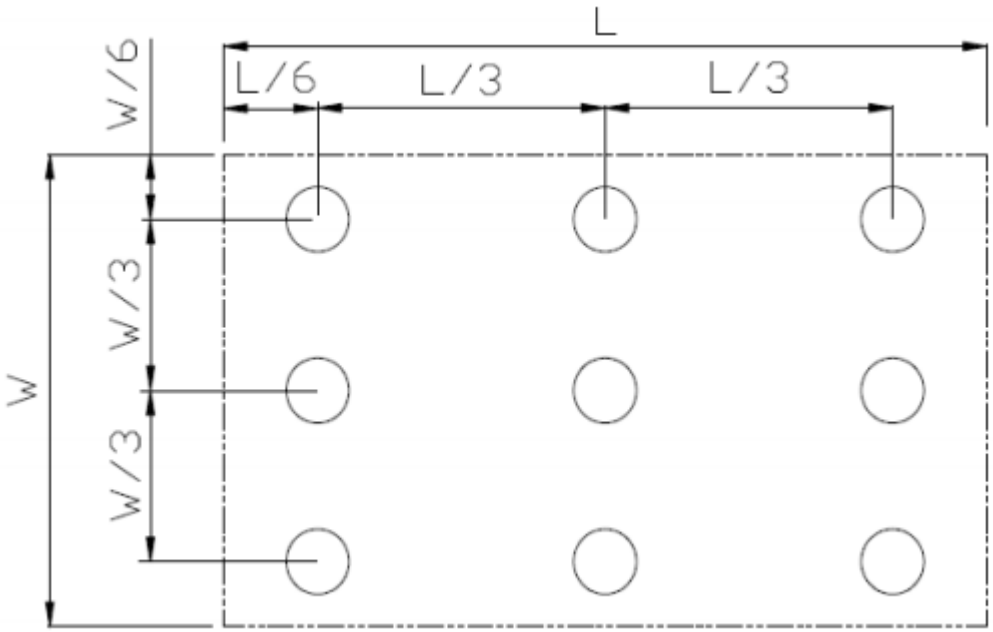


Fig. 2 Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.
Lmin: The measured minimum luminance of all measurement position.

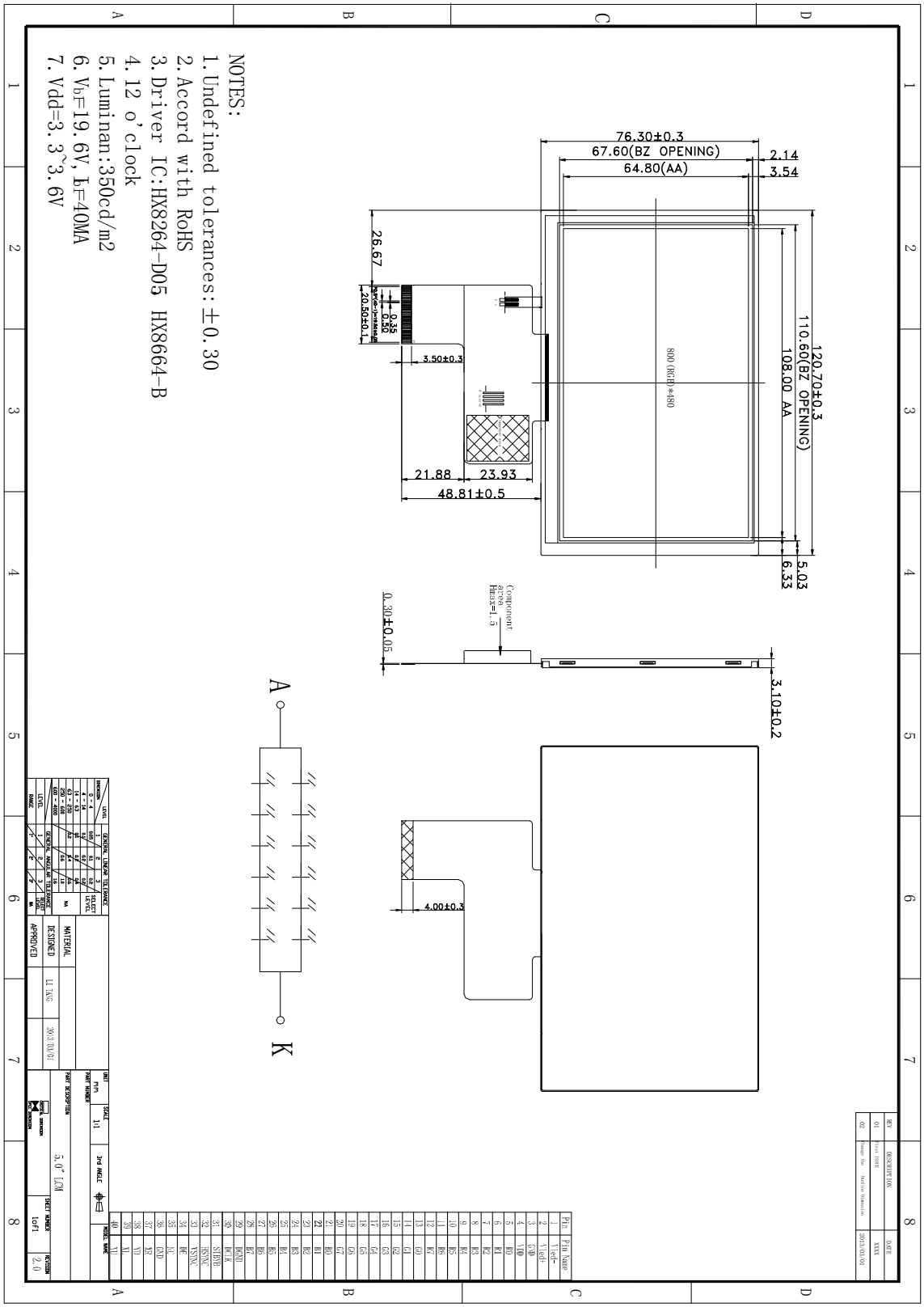
Note 7: Definition of Luminance :
Measure the luminance of white state at center point.

8. Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	Ts= +70℃, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	Ta= -20℃, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= +70℃, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature,end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Opeartion)	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, ± X, ±Y, ± Z 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

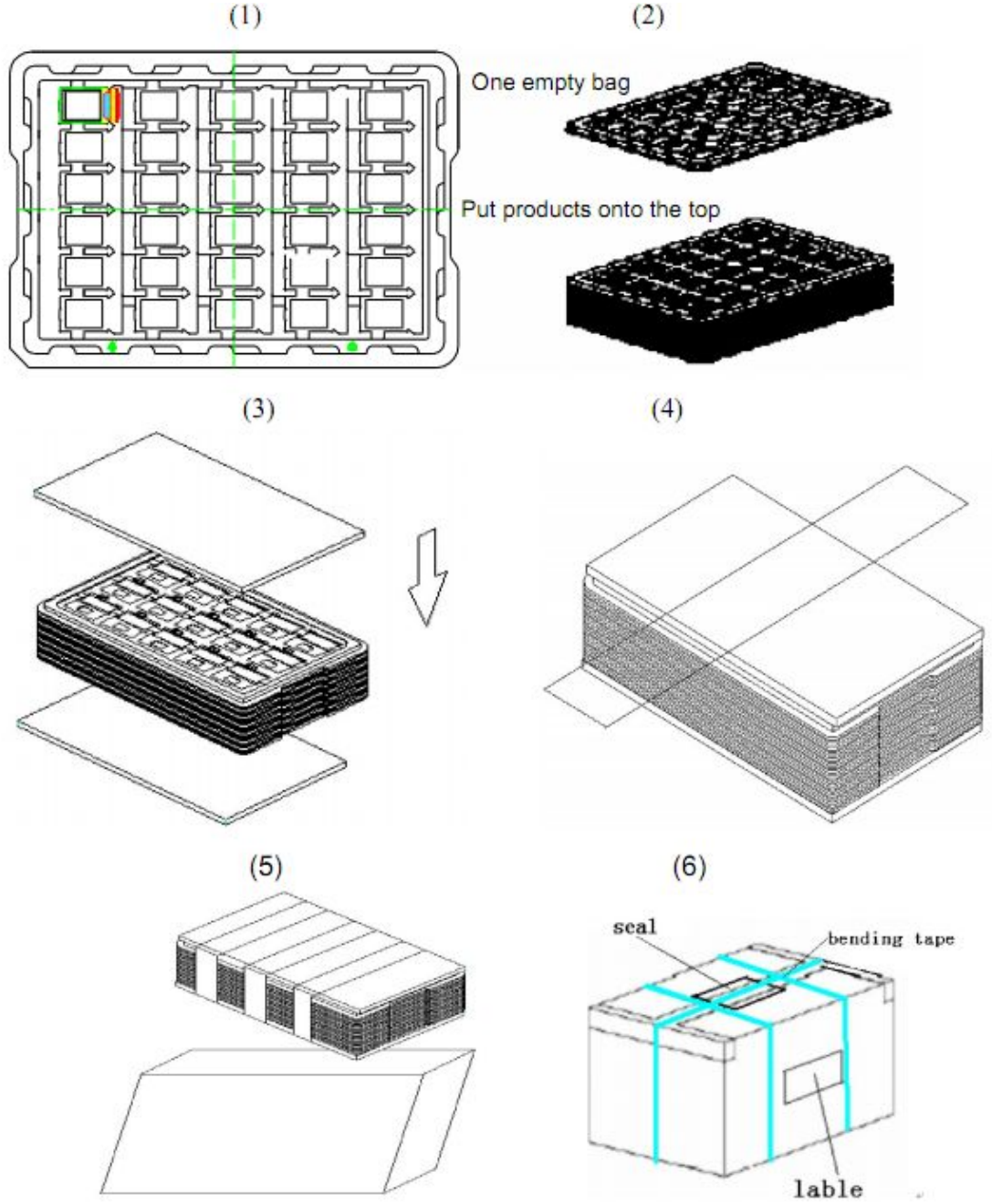
Note: 1. T_S is the temperature of panel's surface.
2. Ta is the ambient temperature of sample.

9. Mechanical Drawing



10. Packing

Packing Method



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.

11. Precautions For Use of LCD modules

11.1 Handling Precautions

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

11.1.2. 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.

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

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

11.1.5. 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

11.1.6. Do not attempt to disassemble the LCD Module.

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

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

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

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

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

11.1.8.4. 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.

11.2 Storage Precautions

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

11.2.2. 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%

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

11.3 Transportation Precautions

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