



深圳市勋瑞光电科技有限公司

Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

Product Specification

Customer: _____

Model Name: H070IWS50I2501-CT25

Date: 2021-11-10

Version: V1.0

☒ Preliminary Specification

☐ Final Specification

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by



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1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2021/11/10	First Release.	ZXG



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2 General Specifications

Feature		Spec
Characteristics	Size	7 inch
	Resolution	1024(horizontal)*600(Vertical)
	Interface	24-bit RGB
	Connect type	Connector
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	0.1506 x 0.1432
	Pixel Configuration	R.G.B. Vertical Stripe
	Display Mode	Normally Black
	Driver IC	HX8282/HX8696
	Surface Treatment	HC
	Viewing Direction	ALL
Mechanical	LCM+CTP (W x H x D) (mm)	164.9*100*5.35
	Active Area(mm)	154.21*85.92
	With /Without TSP	With TSP
	Weight (g)	TBD
	LED Numbers	27 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%



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3 Input/Output Terminals

No.	Symbol	Description
1,2	LED A	LED Anode
3,4	LED K	LED Cathode
5	GND	Power Ground
6	VCOM	Common Voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select
9	DE	Data Enable
10	VS	Vertical sync signal
11	HS	Horizontal sync Signal
12	B7	Blue data(MSB)
13	B6	Blue data
14	B5	Blue data
15	B4	Blue data
16	B3	Blue data
17	B2	Blue data
18	B1	Blue data
19	B0	Blue data(LSB)
20	G7	Green data(MSB)
21	G6	Green data
22	G5	Green data
23	G4	Green data
24	G3	Green data
25	G2	Green data
26	G1	Green data
27	G0	Green data (LSB)
28	R7	Red Data(MSB)
29	R6	Red Data
30	R5	Red Data
31	R4	Red Data



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32	R3	Red Data
33	R2	Red Data
34	R1	Red Data
35	R0	Red Data(LSB)
36	GND	Power Ground
37	DCLK	Pixel clock
38	GND	Power Ground
39	L/R	Left/right selection
40	U/D	up/down selection
41	VGH	Gate ON Voltage
42	VGL	Gate OFF Voltage
43	AVDD	Power for Analog Circuit
44	RESET	Global reset pin
45	NC	NO connection
46	VCOM	Common Voltage
47	DITHB	Dithering function
48	GND	Power Ground
49	NC	NO connection
50	NC	NO connection

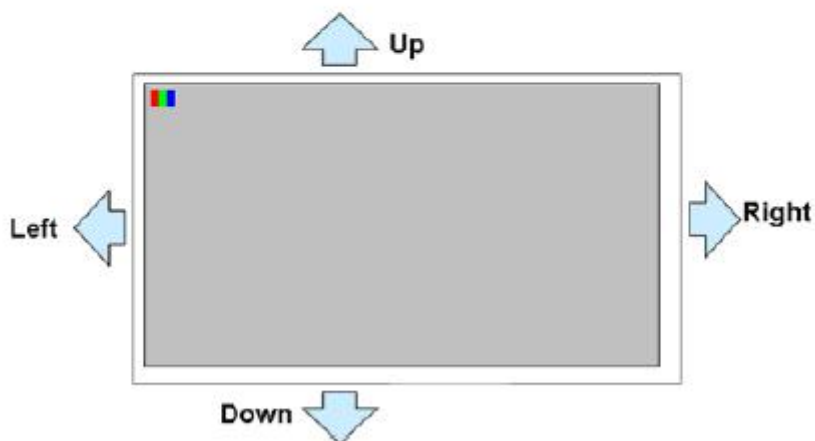


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【Note1】SHLR : left or right setting
UPDN : up or down setting

UPDN	SHLR	FUNCTION
0	1	Normal Display
0	0	Inverse Left and Right
1	1	Inverse Up and Down
1	0	Inverse Left and Right Inverse Up and Down





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4 Absolute Maximum Ratings

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Input signal Voltage	VCOM	-	3.685	-	V	-
Logic Supply Voltage	DVDD	2.3	3.3	3.6	V	-
Analog Supply Voltage	AVDD	-	11.0	-	V	
Low Supply Voltage	VGL	-	-11	-	V	
High Supply Voltage	VGH	-	18	-	V	
Output High Voltage	VIH	0.7XVDD	-	VDD	V	-
Output Low Voltage	VIL	0	-	0.3xVDD	V	-

Note 1: Please adjust VCOM to make the flicker level be minimum. Typ VCOM 电压值
只做参考，具体以实际效果为准（根据FLICKER 状态可调整）

Note 2: The gate IC is the HX8696-A, The source IC is the HX8282-A

5 Electrical Characteristics

5.1 Typical operation conditions

Item	Symbol	Min.	Max.	Unit
Logic Supply Voltage	DVDD	-0.5	5	V
Analog Supply Voltage	AVDD	-0.5	15	V
High Supply Voltage	VGH	-0.3	40	V
Low Supply Voltage	VGL	-20	0.3	V
Operating Temperature	TOP	-20	70	°C
Storage Temperature	TST	-30	80	°C



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5.2.1 Interface Timing

TTL mode DC electrical characteristics

(VDD=3.0~3.6V, AVDD=6.5~13.5V, GND=AGND=0V, TA=-20°C~+85°C)

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Power supply voltage	VDD	3.0	-	3.6	V	-
Power supply voltage	AVDD	6.5	-	13.5	V	-
Power supply voltage	AVDDL	6.5	-	13.5	V	Full range application
		-	V8+0.1	-	V	Half AVDD application
Power supply voltage	AGNDH	0			V	Full range application
		-	V7-0.1	-	V	Half AVDD application
AVDD regulate output	AVDDG	8.9	9	9.1	V	AVDD=10V, VDD=3.3V, with Resistor loading $\geq 30K\ \Omega$, and Capacitor loading $\geq 4.7\mu F$
Low level input voltage	V _{IL}	0	-	0.3VDD	V	For digital circuit
High level input voltage	V _{IH}	0.7VDD	-	VDD	V	For digital circuit
Output low voltage	V _{OL}	-	-	GND+0.4	V	I _{OL} =400 μA
Output high voltage	V _{OH}	VDD-0.4	-	-	V	I _{OH} =-400 μA
Pull low/high resistance	R _i	200	250	300	k Ω	For the digital input pin @VDD=3.3V
Input leakage current	I _i	-	-	± 1	μA	For digital circuit
Digital Operation current	I _{dd}	-	12	20	mA	Fclk=50MHz, LD=48KHz, VDD=3.3V, No load
Digital stand-by current	I _{st1}	-	10	50	μA	Clock & all functions are stopped
Analog Operating current	I _{dda}	-	8	10	mA	No load, Fclk=50MHz, LD=48KHz @ AVDD=10V, V1=8V, V14=0.4V
Analog Stand-by current	I _{st2}	-	10	50	μA	No load, clock & all functions are stopped
Input level of V1~V7	V _{ref1}	0.4AVDD	-	AVDD-0.1	V	Gamma correction voltage input
Input level of V8~V14	V _{ref2}	0.1	-	0.6AVDD	V	Gamma correction voltage input
Output Voltage deviation	V _{od1}	-	± 20	± 35	mV	V _o =AGND+0.1V~AGND+0.5V & V _o =AVDD-0.5V~AVDD-0.1V
Output Voltage deviation	V _{od2}	-	± 15	± 20	mV	V _o =AGND+0.5V~AVDD-0.5V
Output Voltage Offset between Chips	V _{oc}	-	-	± 20	mV	V _o =AGND+0.5V~AVDD-0.5V
Dynamic Range of Output	V _{dr}	0.1	-	AVDD-0.1	V	SO1~SO1200
Sinking Current of Outputs	I _{OLy}	80	-	-	μA	SO1~SO1200; V _o =0.1V vs. 1.0V, AVDD=13.5V
Driving Current of Outputs	I _{OHy}	80	-	-	μA	SO1~SO1200; V _o =0.1V vs. 12.5V, AVDD=13.5V
Resistance of Gamma Table	R _g	0.7*R _n	1.0*R _n	1.3*R _n	Ω	R _n : Internal gamma resistor

Table 9.2: DC electrical characteristics



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TTL mode AC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
VDD Power On Slew rate	T_{POR}	-	-	20	ms	From 0V to 90% VDD
GRB pulse width	T_{GRB}	50	-	-	μ s	-
DCLK cycle time	T_{csh}	14	-	-	ns	-
DCLK pulse duty	T_{csh}	40	50	60	%	-
VSD setup time	T_{rst}	5	-	-	ns	-
VSD hold time	T_{vhd}	5	-	-	ns	-
HSD setup time	T_{rst}	5	-	-	ns	-
HSD hold time	T_{hhd}	5	-	-	ns	-
Data set-up time	T_{dsu}	5	-	-	ns	D0[7:0], D1[7:0], D2[7:0] to DCLK
Data hold time	T_{dhd}	5	-	-	ns	D0[7:0], D1[7:0], D2[7:0] to DCLK
DE setup time	T_{esu}	5	-	-	ns	-
DE hold time	T_{ehd}	5	-	-	ns	-
Output stable time	T_{sst}	-	-	6	μ s	10% to 90% target voltage. CL=90pF, R=10K ohm (Cascade)
				3		Dual gate

Table 10.1: TTL mode AC electrical characteristics



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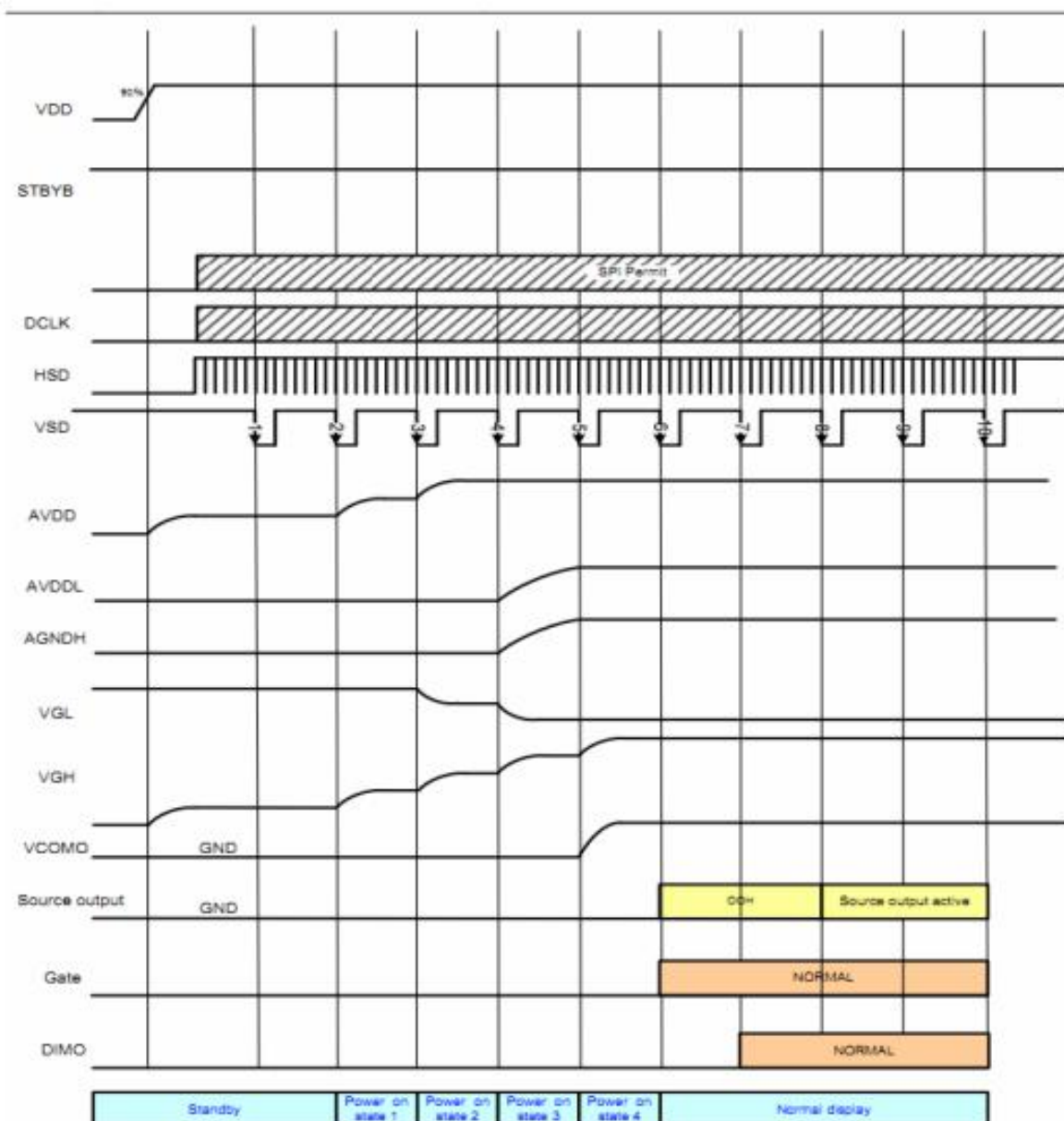
5.2.2 power signal sequence

To prevent the device damage from latch up, the power on/off sequence shown below must be followed.

Power on: VDD, GND _ AVDD, AGND _ V1 to V14

Power off: V1 to V14 _ AVDD, AGND _ VDD, GND

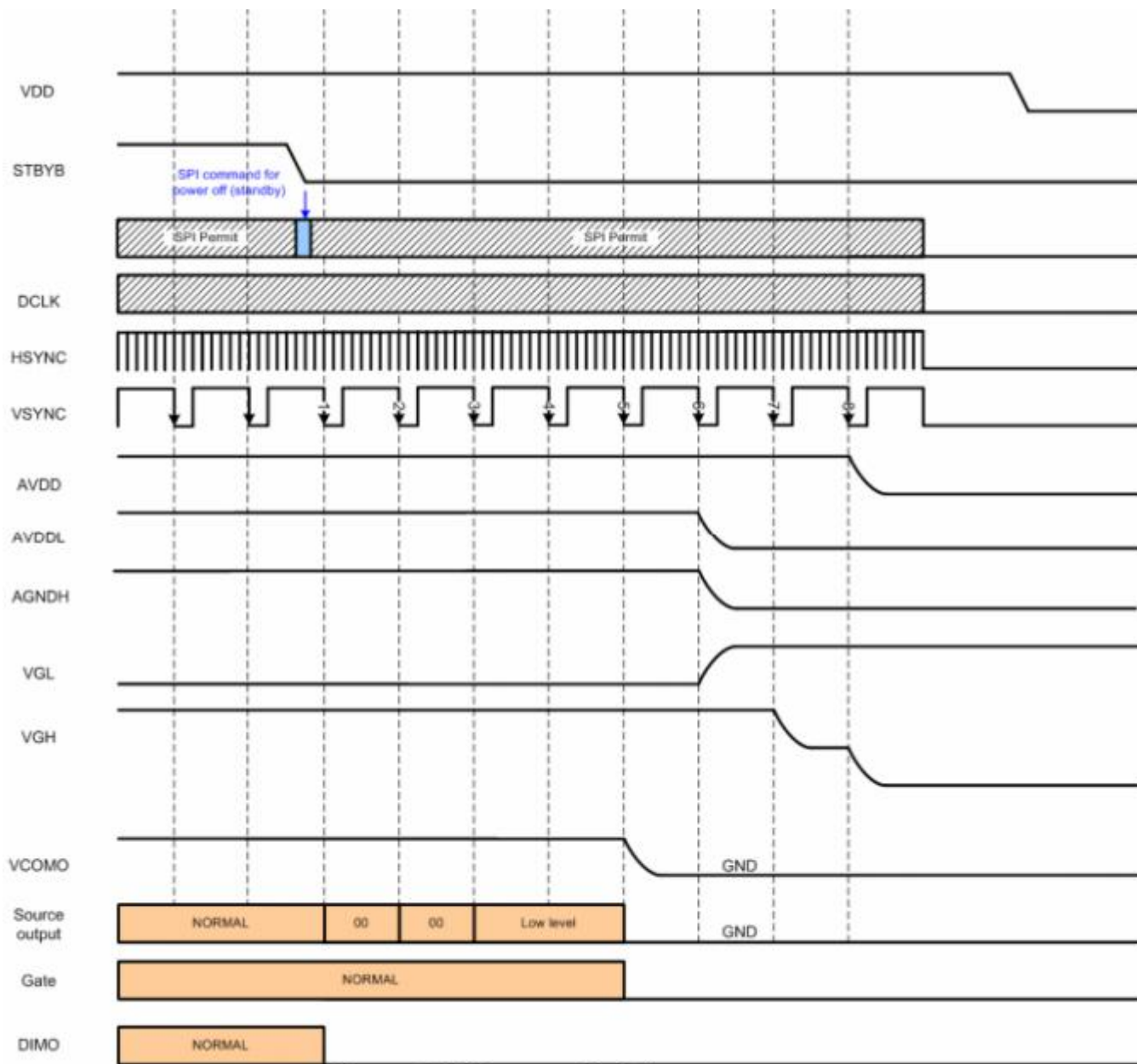
Power on/off control





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Power off timing sequence





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5.4 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	180	-	mA	
Forward Voltage	V_F	8.4	9	10.2	V	
colour temperature		-	-	-	K(kelvin)	
Backlight Power consumption	W_{BL}	-	TBD	-	W	

Note 1: Each LED : $I_F = 20 \text{ mA}$, $V_F = 3 \text{ V}$.

Note 2: Optical performance should be evaluated at $T_a = 25^\circ\text{C}$ 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.



6 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10		80	-	Degree.	Note2
		θ_B			80	-		
		θ_L			80	-		
		θ_R			80	-		
Contrast Ratio		CR	$\Theta =0$	600	800	-	-	Note1, Note3
Response Time		T _r +T _f	25°C	-	25	35	ms	Note1, Note4
Chromaticity	White	X _W	Backlight is on	0.270	0.290	0.310	-	Note1, Note5
		Y _W		0.311	0.331	0.351	-	
	Red	X _R		0.612	0.602	0.652	-	
		Y _R		0.291	0.328	0.331	-	
	Green	X _G		0.277	0.301	0.317	-	
		Y _G		0.516	0.556	0.556	-	
	Blue	X _B		0.120	0.148	0.160	-	
		Y _B		0.134	0.168	0.174	-	
Uniformity		U		-	75	-	%	Note1, Note6
LCM+CTP Luminance		L		-	210	-		Note1, Note7

Test Conditions:

1. $V_{DD}=3.3V$, the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

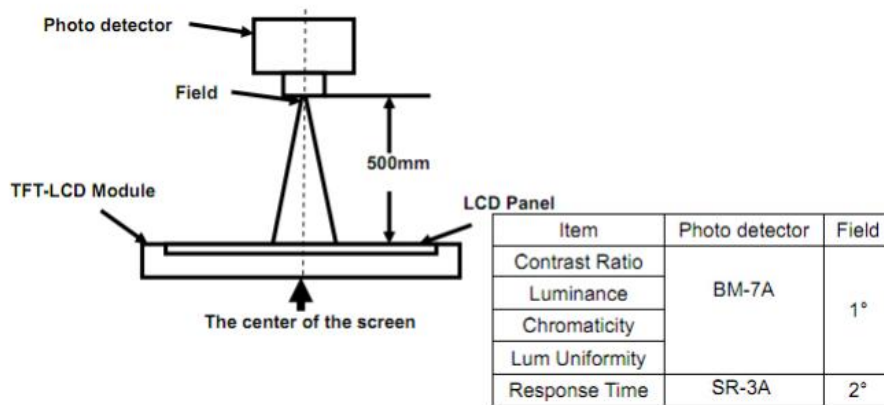
Note 1: Definition of optical measurement system.

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.



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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).

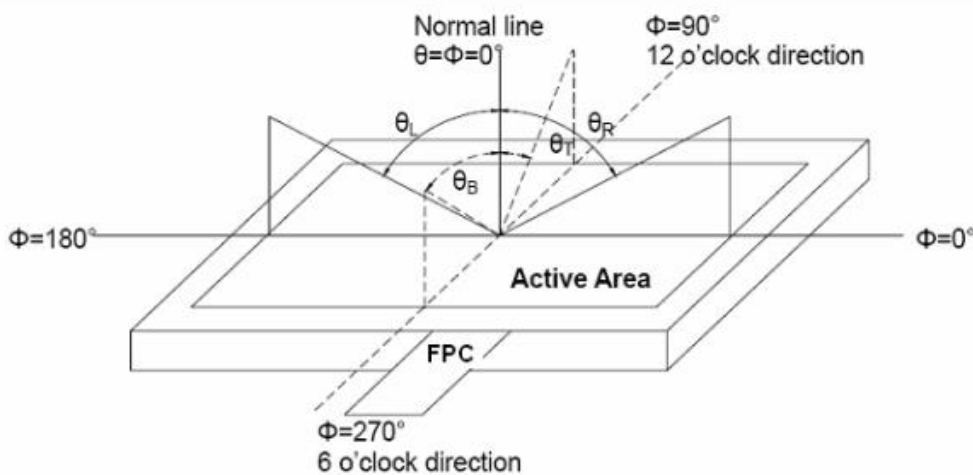


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

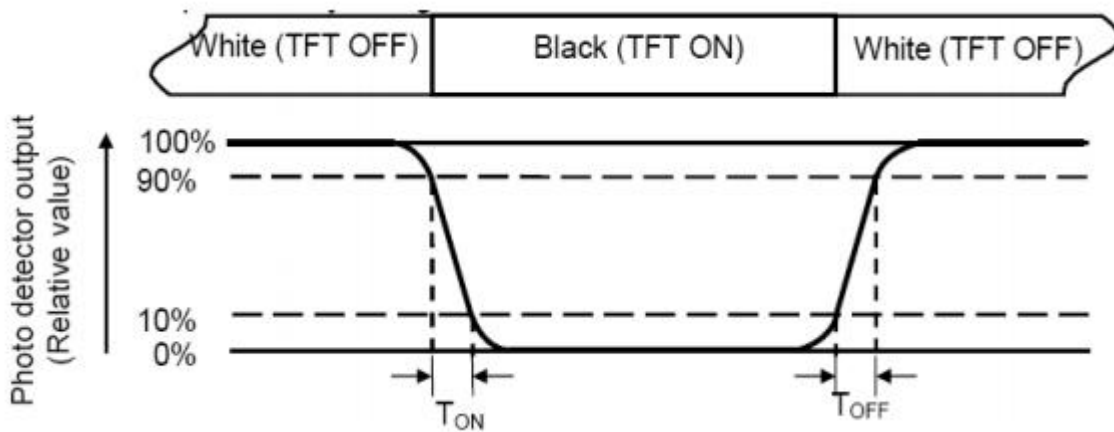
Note 4: Definition of Response time

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%.



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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) = $L_{min} / L_{max} \times 100\%$

L-----Active area length W----- Active area width

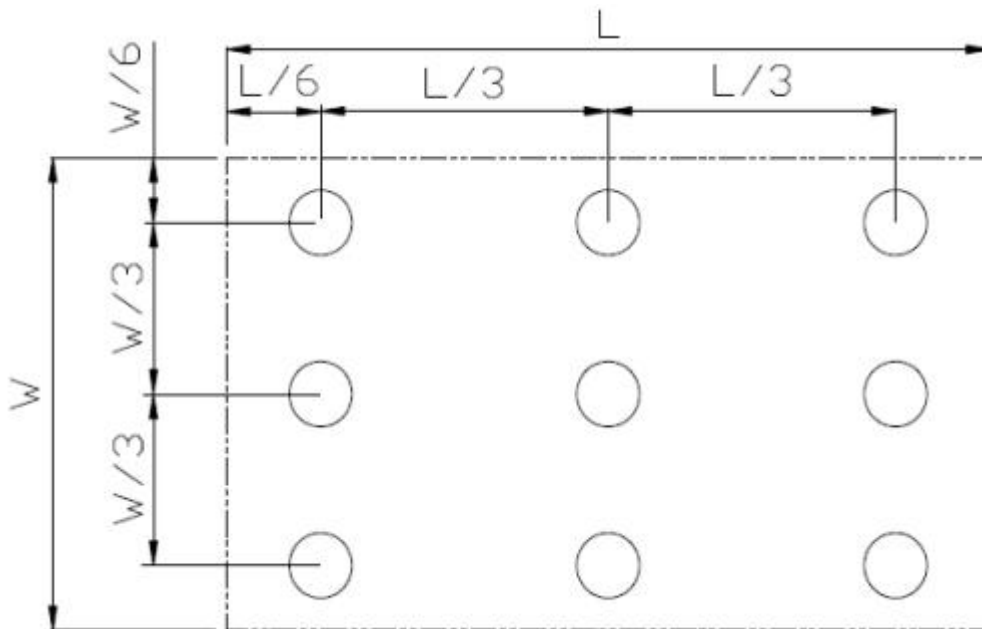


Fig. 2 Definition of uniformity

L_{max} : The measured maximum luminance of all measurement position.

L_{min} : The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance :

Measure the luminance of white state at center point.



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7 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	Ts= +50℃, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	Ta= -10℃, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +60℃, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -20℃, 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)	-20℃ 30 min ~ +60℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature,end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Discharge (Opeartion) Static	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. Ts is the temperature of panel's surface.

2. Ta is the ambient temperature of sample.



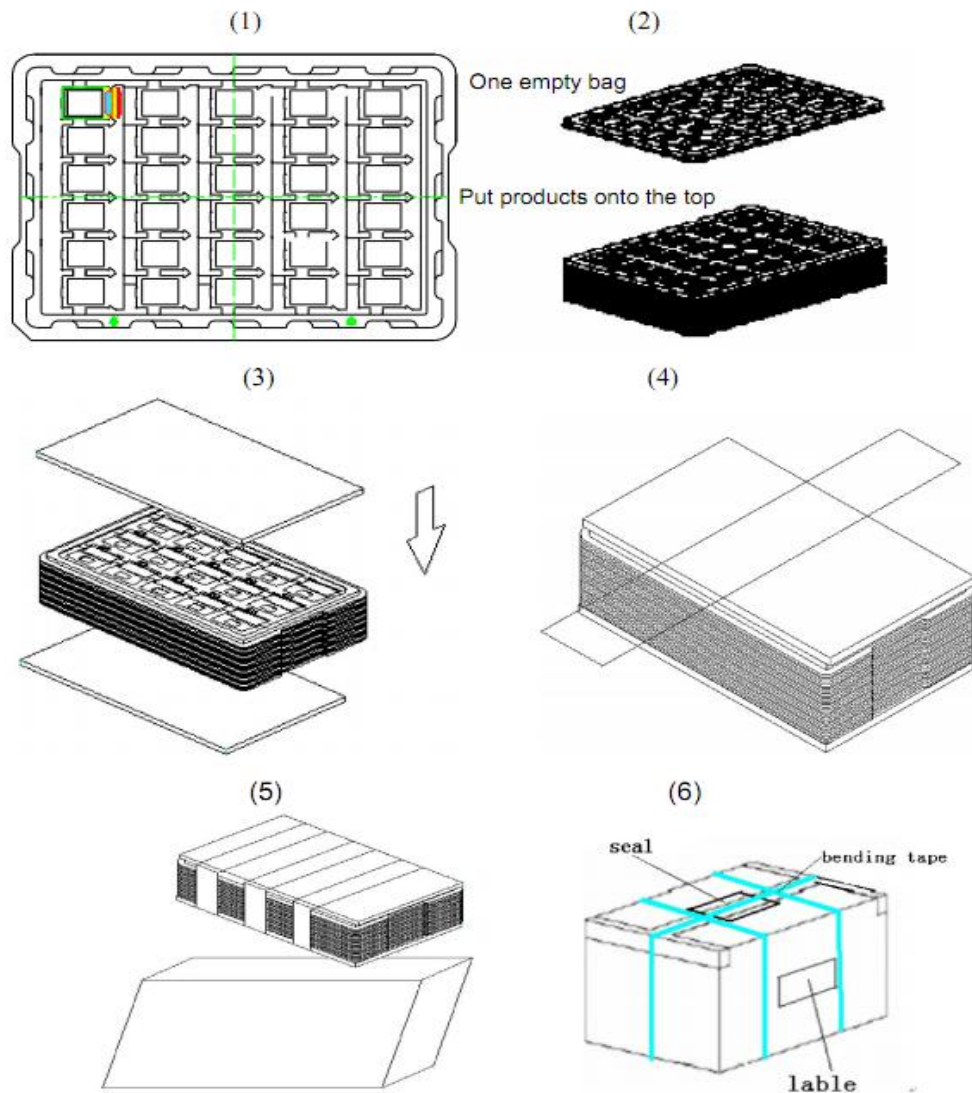


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9 Packing

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



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

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