



深圳显昶光电科技有限公司

Shenzhen Xianyang Optoelectronic Technology Co., Ltd

PRODUCTION SPECIFICATION OF LCD MODULE MODULE NO.: XY043HWV6287CNT

Customer Name:			
Customer Part Number:			
Approved By:		Date:	

Prepared By	Checked By	Approved By

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Revision History

Rev	Issued Date	Description	Page	Editor
1.0	May. 18,2023	First release	All	

1 General Specifications

Feature		Specifications
Display Spec.	LCD type	4.3 inch
	Resolution (H*V)	480(RGB) × 272
	Technology Type	a-Si TFT
	Pixel Configuration	R.G.B. Vertical Stripe
	Display Mode	Transmissive / Normally Black
	Viewing Direction	ALL o' clock
	Gray Scale Inversion Direction	ALL o' clock
Mechanical Characteristics	OutlineDimensions (W x H x T) (mm)	105.5*67.2*3.0
	Active Area(mm)	95.04*53.86
	With /Without Touch screen	Without
	Match Connector Type	0.5 Pitch40pin
	Backlight Type	White LED
	Weight (g)	TBD
Electrical Characteristics	Interface	24RGB
	Number of color	16M

Note 1: Viewing direction for best image quality is different from TFT definition.

2 Pin Assignment

NO.	PIN	I/O	Description
1	LED-K	I	LED Cathode
2	LED-A	I	LED Anode
3	VSS	I	Power Ground
4	VDD	I	Power Source
5	R00	I	RED Data Signal (LSB)
6	R01	I	RED Data Signal
7	R02	I	RED Data Signal
8	R03	I	RED Data Signal
9	R04	I	RED Data Signal
10	R05	I	RED Data Signal
11	R06	I	RED Data Signal
12	R07	I	RED Data Signal
13	G00	I	GREEN Data Signal(LSB)
14	G01	I	GREEN Data Signal
15	G02	I	GREEN Data Signal
16	G03	I	GREEN Data Signal
17	G04	I	GREEN Data Signal
18	G05	I	GREEN Data Signal
19	G06	I	GREEN Data Signal
20	G07	I	GREEN Data Signal
21	B00	I	BLUE Data Signal(LSB)
22	B01	I	BLUE Data Signal
23	B02	I	BLUE Data Signal
24	B03	I	BLUE Data Signal
25	B04	I	BLUE Data Signal
26	B05	I	BLUE Data Signal
27	B06	I	BLUE Data Signal
28	B07	I	BLUE Data Signal
29	VSS	I	Power Ground
30	DLCK	I	Clock Signal to Sample each date
31	DISP	I	Display ON/OFF Signal
32	HSYNC	I	Horizontal Synchronizing Signal
33	VSNC	I	Vertical Synchronizing Signal
34	DE	I	Input Data enable control
35	NC	-	Set Open
36	GND	I	Power Ground
37	XR	I	Touch Panel PIN
38	YD	I	Touch Panel PIN
39	XL	I	Touch Panel PIN
40	YU	I	Touch Panel PIN

Note1: I/O definition: I-----Input O---Output P----Power/Ground

3 Absolute Maximum Ratings

GND=0V, Ta= 25°C

Item	Symbol	Value	Unit
Power supply voltage for logic	V _{DD}	1.6~3.3	V
Input voltage	V _{in}	V _{DD} +0.3	V
Operating temperature	T _{opr}	-20 to 70	°C
Storage temperature	T _{stg}	-30 to 80	°C

4 Electrical Characteristics

4.1 DC Characteristics (VDD=2.8V,Ta=25°C)

Item	Symbol	Min	Type	Max	Unit	Test condition
Operating voltage	V _{DD}	2.8	3.3	3.6	V	-
Supply current	I _{DD}	-	-	30	mA	V _{DD} =2.8V,Ta=25. °C
Input voltage	V _{IH}	0.8VDD	-	VDD	V	-
	V _{IL}	0	-	0.2VDD	V	
Input leakage current	I _{IL}	-1.0	-	1.0	μA	V _{IN} =V _{DD} or V _{SS}

Note: Voltage greater than above may damage the module.

All voltages are specified relative to VSS=0V.

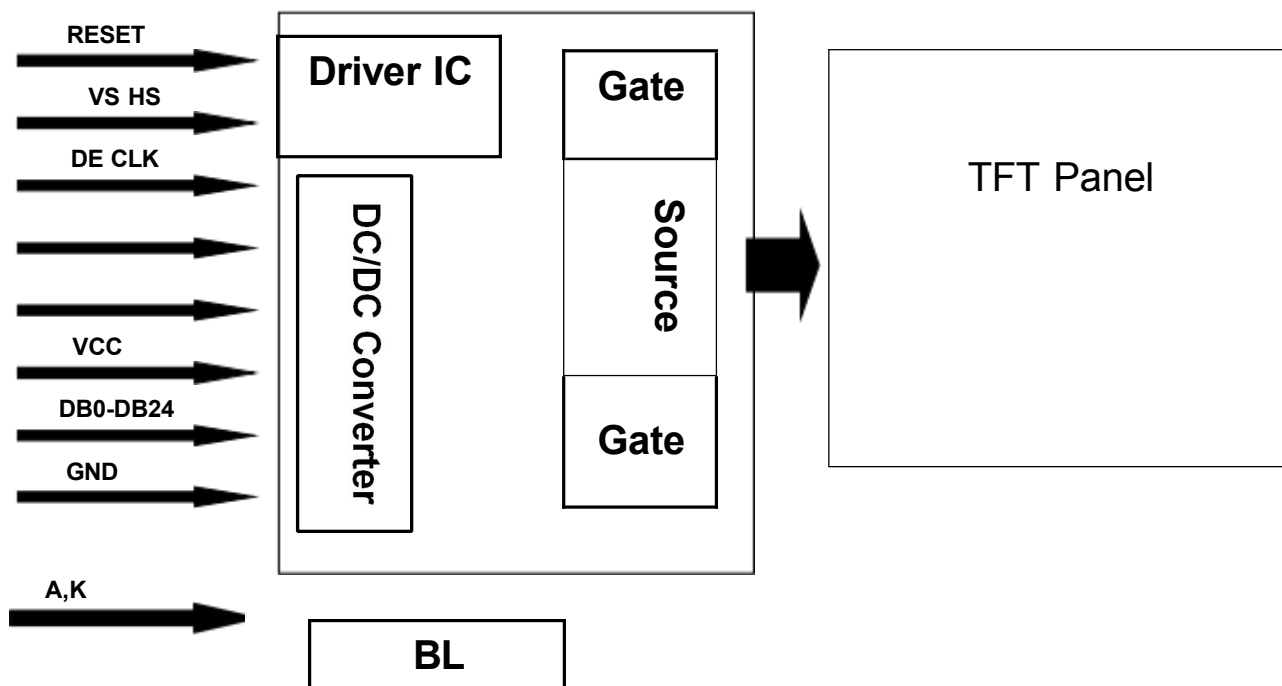
4.2 Driving Backlight

Ta=25°C

Item	Symbol	Min	Typ	Max	Unit	Remark
Forward Current	I _F	--	20	100	mA	
Forward Voltage	V _F	-	21	-	V	
Connection mode	P	--	7S	--		
LED number	/		7		pcs	
LED life time			20000		hour	

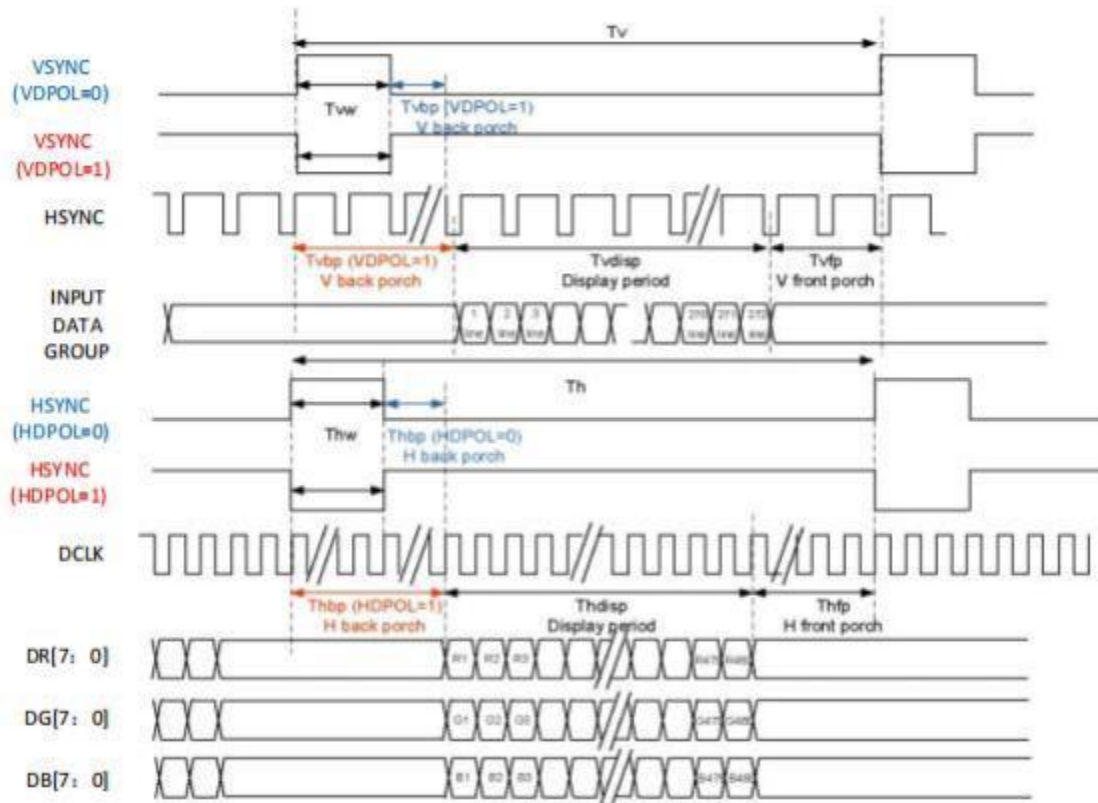
Note1: Optical performance should be evaluated at Ta=25°C only .If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

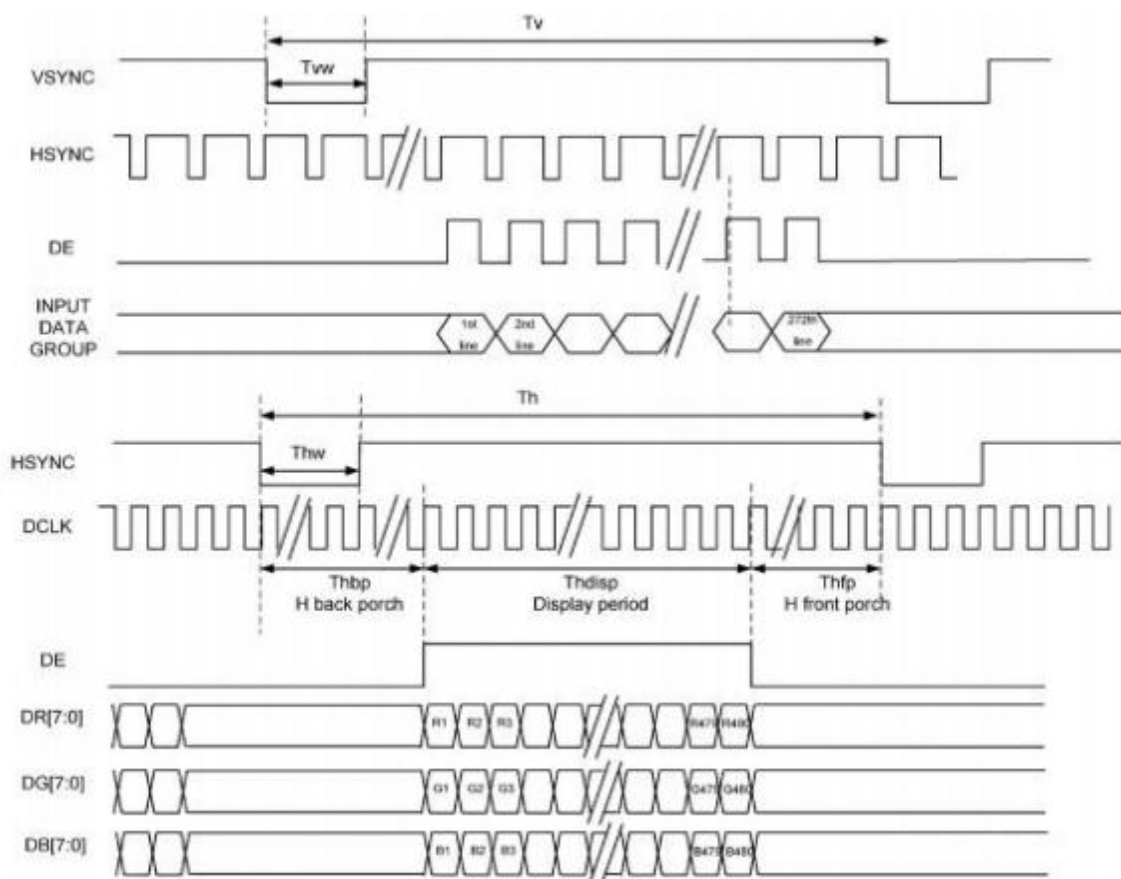
4.3 Block Diagram



5 INTERFACE TIMING

5.1 RGB interface



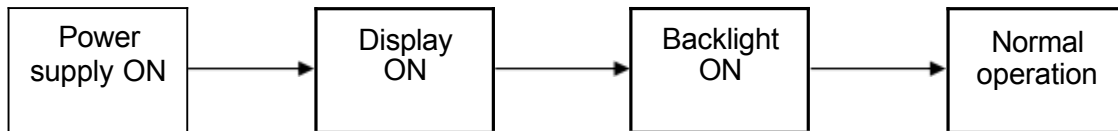
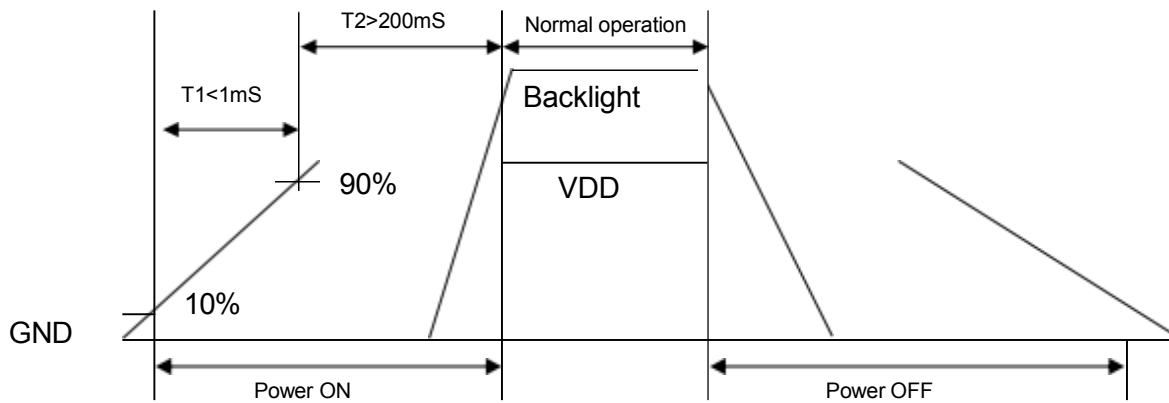


Parallel 24-bit RGB Input Timing (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

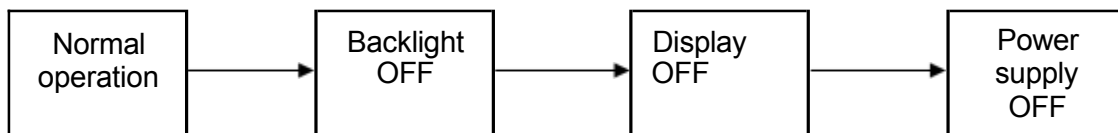
480RGB X 272 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_BLANKING setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	43	DCLK	
VSYNC	Period Time	Tv	276	292	321	HSYNC	
	Display Period	Tvdisp		272		HSYNC	
	Back Porch	Tvbp	2	12	12	HSYNC	By V_BLANKING setting
	Front Porch	Tvfp	2	8	37	HSYNC	
	Pulse Width	Tw	2	4	12	HSYNC	

Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

5.2 Power ON/OFF Timing



Power ON sequence



Power OFF sequence

6 Optical Characteristics

Ta=25°C

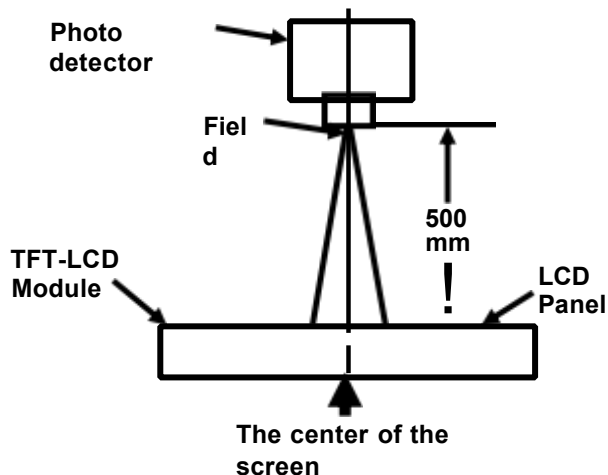
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles	θT	$CR \geq 10$	70	80	-	Degree	Note 2
	θB		70	80	-		
	θL		70	80	-		
	θR		70	80	-		
Contrast Ratio	CR	$\theta=0^\circ$	500	700	-	-	Note1 Note3
Response Time	T_{ON}	25°C	-	15	-	ms	Note1 Note4
	T_{OFF}						
Uniformity	U	-	70	80	-	%	Note1 Note6
NTSC	-	-	-	50	-	%	Note 5
Luminance	L		-	250	-	cd/m ²	Note1 Note7

Test Conditions:

1. $V_F=21V$, $I_F=20mA$, 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.



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).

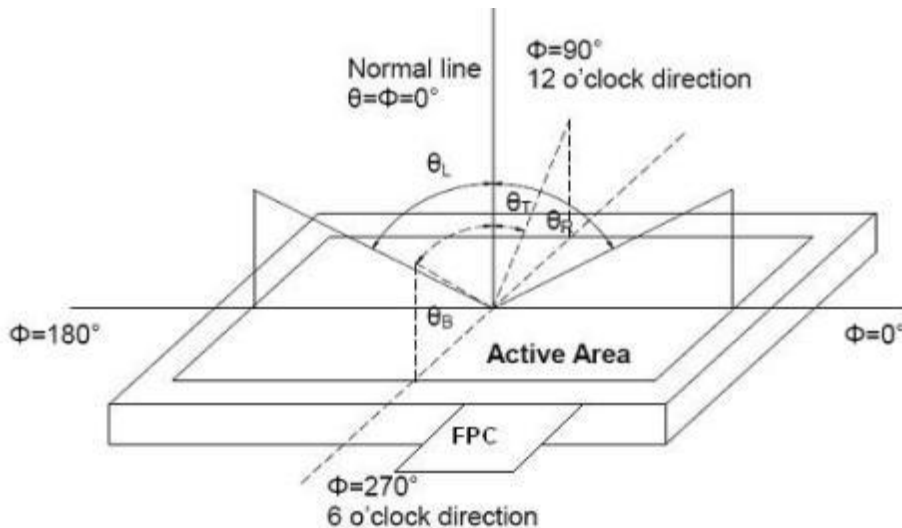


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

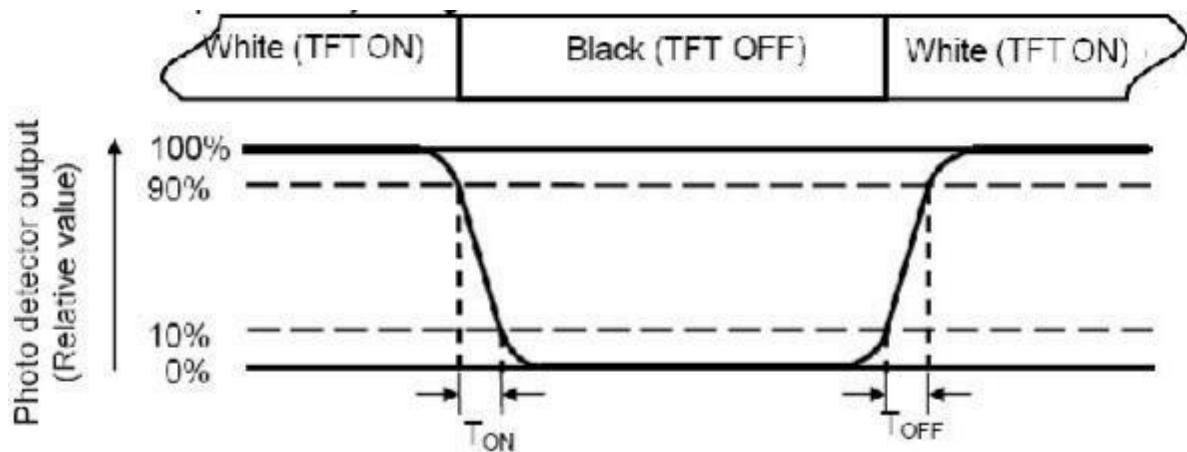
“White state “:The state is that the LCD should be driven by V_{white}.

“Black state”: The state is that the LCD should be driven by V_{black}.

V_{white}: To be determined V_{black}: 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) = L_{min} / L_{max}

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

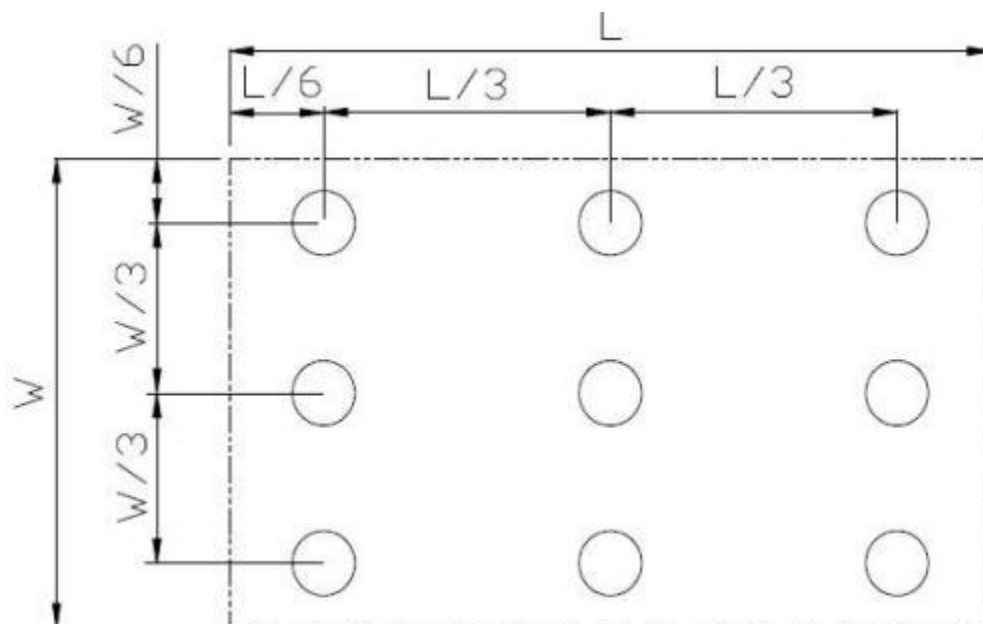


Fig. 2 Definition of uniformity

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

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

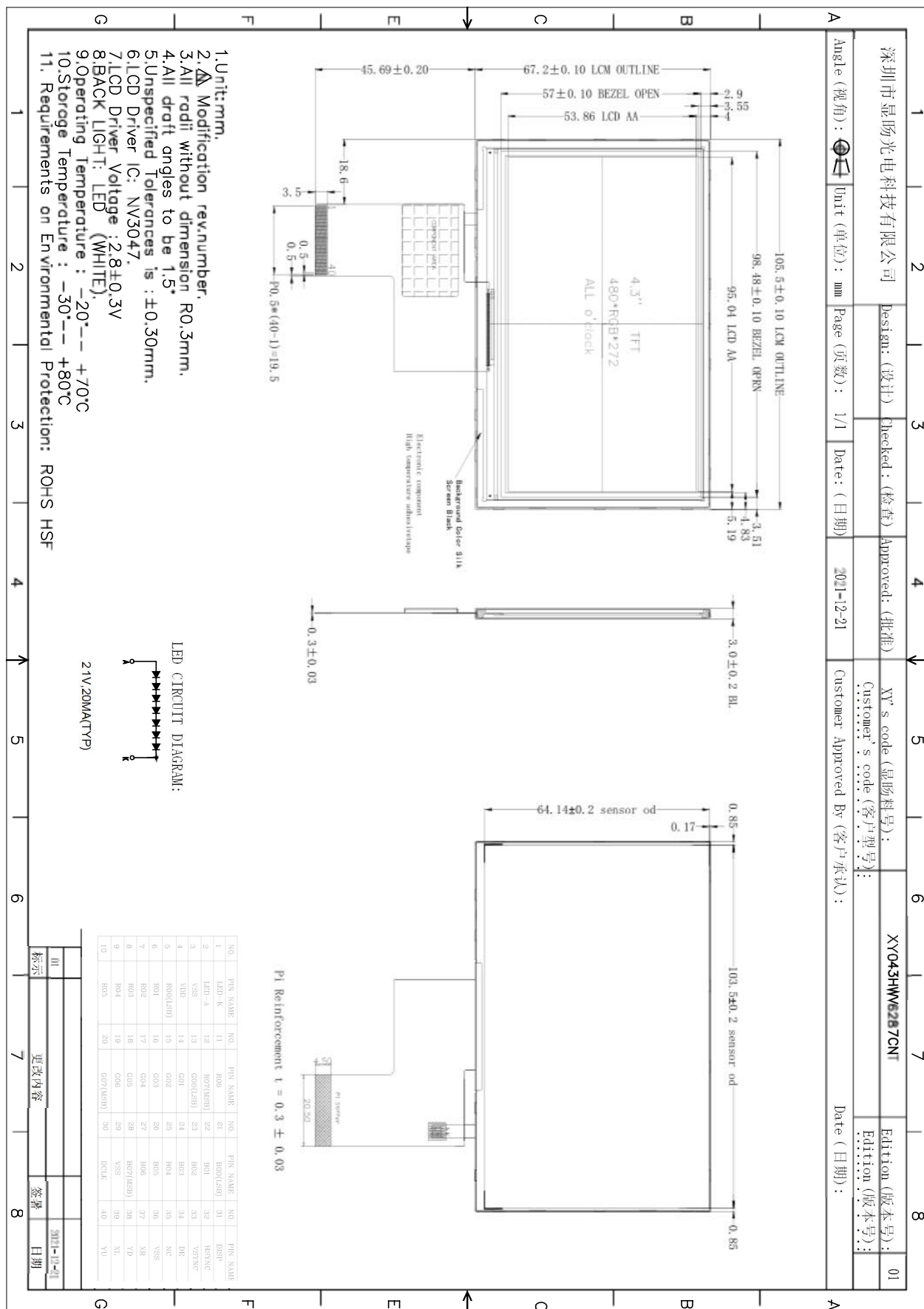
Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

7 Environmental / Reliability Test

Item	Condition	Time (hrs)	Assessment
High temp. Storage	80. C	120	No abnormalities in functions and appearance
High temp. Operating	70. C	120	
Low temp. Storage	-30. C	120	
Low temp. Operating	-20. C	120	
Humidity	40. C/ 90%RH	120	
Thermal Shock(Non-operation)	-20. C ← 25. C → 70. C (0.5 hour ← 5 min → 0.5 hour)	10cycles	

8 Mechanical Drawing



9 Precautions For Use of LCD Modules

9.1 Handling Precautions

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

9.1.1.2 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.

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

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

9.1.1.5 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

9.1.1.6 Do not attempt to disassemble the LCD Module.

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

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

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

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

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

9.1.1.12 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.

9.1.1.13 Storage precautions

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

9.1.1.15 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:

9.1.1.16 Temperature : 0℃ ~ 40℃ Relatively humidity: ≤80%

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

9.2 Transportation Precautions

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