深圳市勋瑞光电科技有限公司
Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

Product Specification

Customer: ______________________

Model Name: H057BWV60I3501

Date: 2023.06.01

Version: A0

■ **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

Version	Revise Date	Content	Editor
A0	2023/06/01	First Release.	

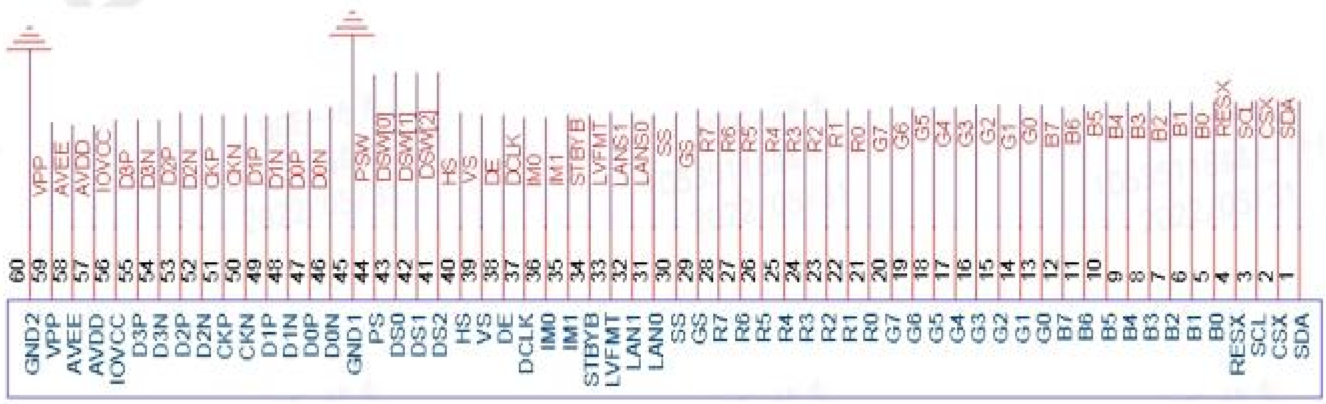
2 General Specifications

Feature		Spec
Characteristics	LCD Size	5.7 inch
	Display Format	640 (RGB) × 480
	Interface	RGB&LVDS&MIPI
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec.	0.180(H) x 0.180(V)
	Display Mode	Normally Black
	Driver IC	JD9168S
	Surface Treatment	HC
	Viewing Direction	ALL
	Gray Viewing Direction	FREE
Mechanical	LCM (W x H x D) (mm)	127*98.43*5.9
	Active Area(mm)	115.2(H)x 86.4(V)
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	21LEDs

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

3 Input/Output Terminals

Pin NO.	Pin name	Description	Pin NO.	Pin name	Description	Pin NO.	Pin name	Description	Pin NO.	Pin name	Description
1	SDA	SPI data	16	G3	RGB data	31	LAN0	lane mode	46	D0N	LVDS D0N
2	CSX	Chip select	17	G4	RGB data	32	LAN1	lane mode	47	D0P	LVDS D0P
3	SCL	SPI clock	18	G5	RGB data	33	LVFMT	LVDS data for mat	48	D1N	LVDS D1N
4	RESX	Reset	19	G6	RGB data	34	STBYB	standy mode	49	D1P	LVDS D1P
5	B0	RGB data	20	G7	RGB data	35	IM1	IF mode slect	50	CKN	LVDS CKN
6	B1	RGB data	21	R0	RGB data	36	IM0	IF mode slect	51	CKP	LVDS CKP
7	B2	RGB data	22	R1	RGB data	37	DCLK	RGB clock	52	D2N	LVDS D2N
8	B3	RGB data	23	R2	RGB data	38	DE	RGB data enab le	53	D2P	LVDS D2P
9	B4	RGB data	24	R3	RGB data	39	VS	RGB V-sync	54	D3N	LVDS D3N
10	B5	RGB data	25	R4	RGB data	40	HS	RGB H-sync	55	D3P	LVDS D3P
11	B6	RGB data	26	R5	RGB data	41	DS2	data lane seq	56	IOVCC	Power
12	B7	RGB data	27	R6	RGB data	42	DS1	data lane seq	57	AVDD	Power
13	G0	RGB data	28	R7	RGB data	43	DS0	data lane seq	58	AVEE	Power
14	G1	RGB data	29	GS	gate scan	44	PS	data lane seq	59	VPP	OTP power
15	G2	RGB data	30	SS	source scan	45	GND	Ground	60	GND	Ground



4 Absolute Maximum Ratings

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage values are listed in Table 2. All the measurements should be operated with driver IC and FPC mounted.

<Table 2. Absolute Maximum Ratings>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Supply Voltage	IOVCC	2.5	3.3	3.3	V	Note 1&2
	VSP	4.5	5.5	6.0	V	
	VSN	-4.5	-5.5	-6.0	V	
Operating Temperature (Humidity)	T_{OP}	-30	-	+80	℃	
	RH	-	-	90	%	At 60° C
Storage Temperature (Humidity)	T_{ST}	-30	-	+80	℃	
	RH	-	-	90	%	At 60° C

Note:
1. These range above is maximum value not the actual operating temperature . Actual Operating temperature is no more than 40℃ and temperature refers to the LCM surface temperature ;
2.BOE is not responsible for product problems beyond the use conditions.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Supply Voltage	IOVCC	2.5	3.3	3.3	V	Note 1&2
	VSP	4.5	5.5	6.0	V	
	VSN	-4.5	-5.5	-6.0	V	
Operating Temperature (Humidity)	T_{OP}	-30	-	+80	℃	
	RH	-	-	90	%	At 60° C
Storage Temperature (Humidity)	T_{ST}	-30	-	+80	℃	
	RH	-	-	90	%	At 60° C

5 Electrical Characteristics

5.1 Electrical Specifications

<Table 3. LCD FOG Electrical Specifications >

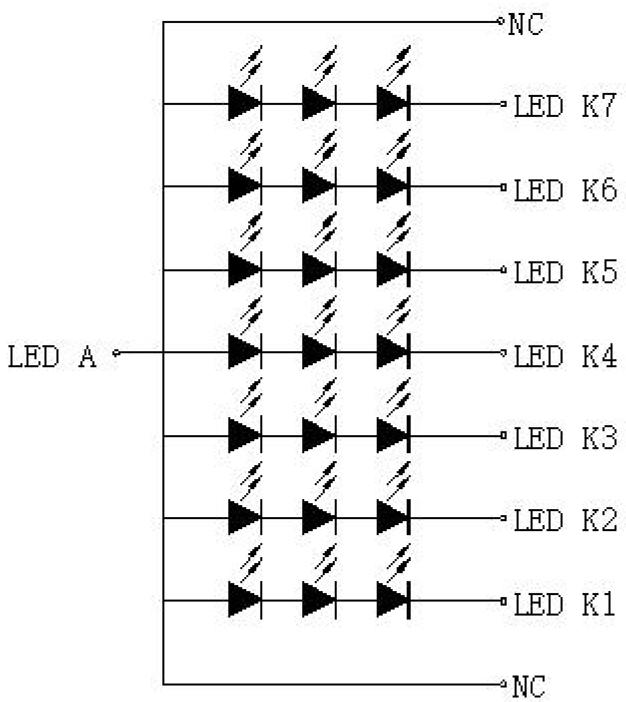
Parameter		Symbol	Values Min.	Typ.	Max.	Unit	Notes
Power Supply Input Voltage		IOVCC	2.5	3.3	3.3	V	Ta = 25 ℃ Note 1
		VSP	4.5	5.5	6.0	V	
		VSN	-4.5	-5.5	6.0	V	
Current Consumption	Operating	IOVCC	5	5.09	6.1	mA	@L255
		VSP	9.2	9.49	11.4	mA	
		VSN	8.25	8.44	10.1	mA	
		Power	112.5	115.5	138.5	mA	
	Sleep in	IOVCC	-	0.45	-	mA	
		VSP	-	0.0068	-	mA	
		VSN	-	0.065	-	mA	
		Power	-	1.88	-	mW	

Note:
1.This is the voltage range of the IC. In this range, when the voltage is too low, the brightness of LCD may decrease

5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I_F	-	140	-	mA	
Power Consumption		-	1.08	-	mW	
LED Voltage	V_F	8.4	9	9.6	V	Note 1
LED Life Time	W_{BL}	30000	-	-	Hr	Note 2,3

Note 1 : There are 7 Groups LED



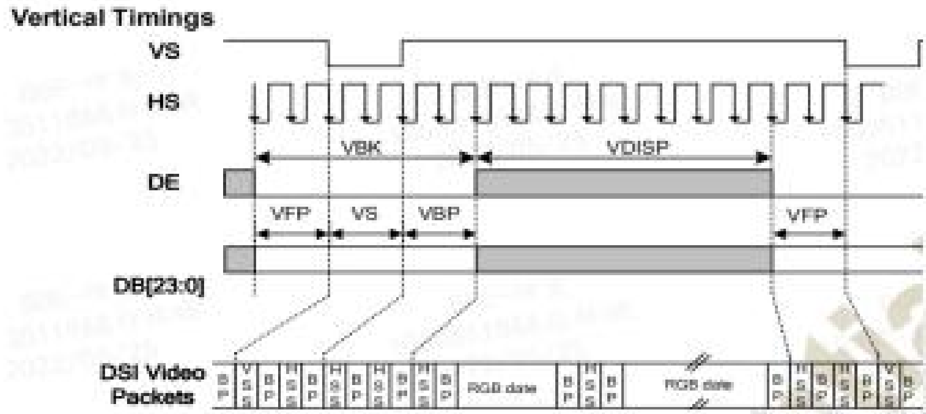
3*7=21EA If=140mA

Note 2 : Ta = 25℃

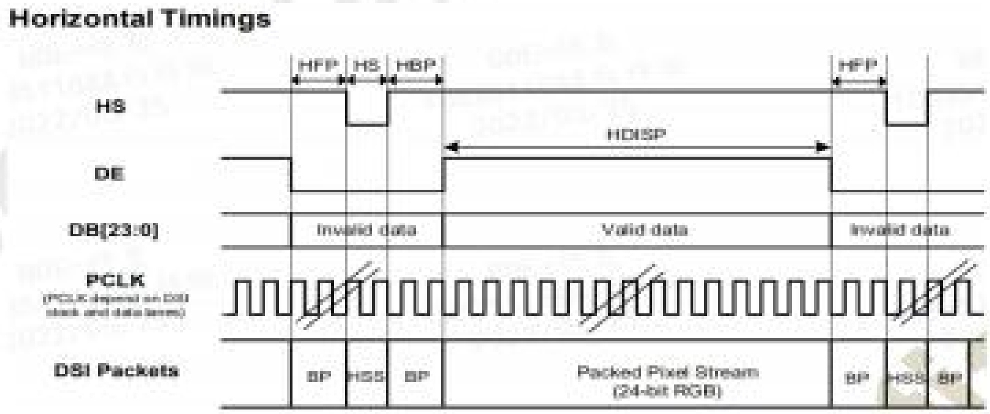
Note 3 : Brightness to be decreased to 50% of the initial value

6 Interface Timing

6.1 Timing Chart of Signals in RGB Interface



Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Vertical low pulse width	VS	-	2	-	Note[1]	Line
Vertical front porch	VFP	-	2	-	-	Line
Vertical back porch	VBP	-	2	-	Note[1]	Line
Vertical blanking period	VBK	VS+VBP+VFP	6	-	-	Line
Vertical active area	-	VDISP	-	480	-	Line
Vertical Refresh rate	VRR	-	-	60	-	Hz

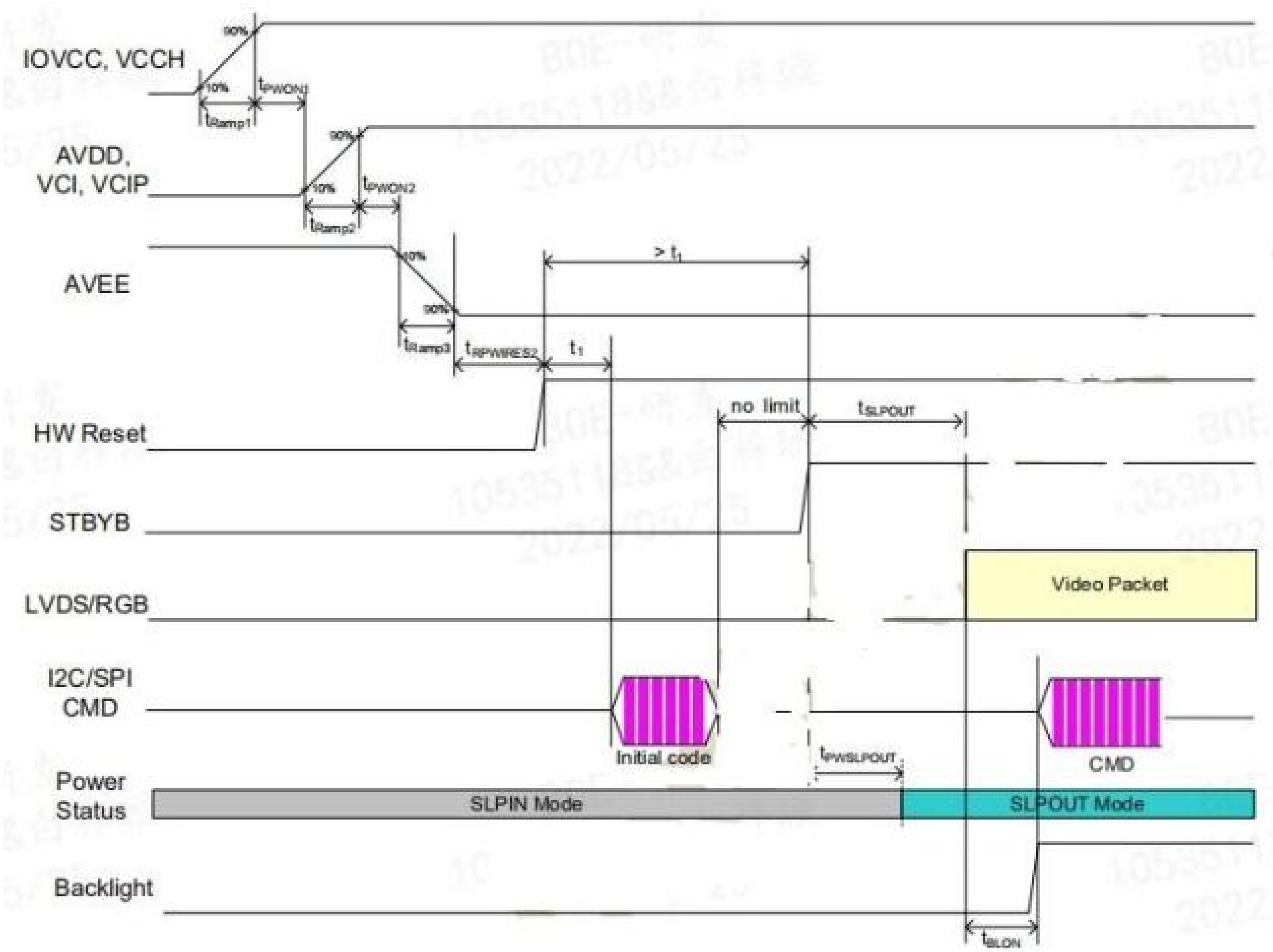


Item	Symbol	Condition	Min.	Typ.	Max.	Unit
HS low pulse width	HS	-	100			ns
Horizontal back porch	HBP	-	100			ns
Horizontal front porch	HFP	-	400			ns
Horizontal blanking period	HBLK	HS+HBP+HFP		900[1]		ns
Horizontal active area	HDISP	800 pixels	-	12[2]	-	us

Remark：Porch setting is related to MCU PCLK and Frames

6.2 power mode power on sequence

< Figure 6. 3 power mode power on sequence >

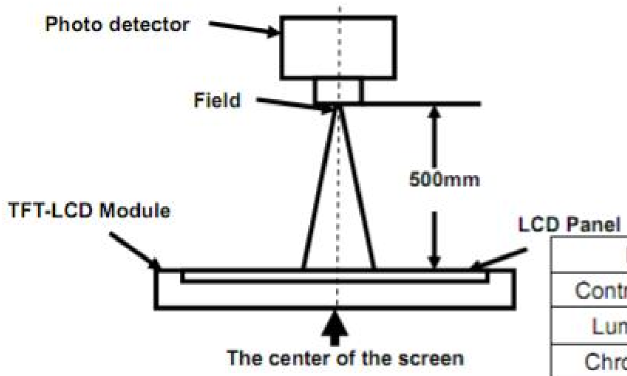


7 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	75	80	-	Degree.	Note2
		θ_B		75	80	-		
		θ_L		75	80	-		
		θ_R		75	80	-		
Contrast Ratio		CR	Θ =0	1000	1200	-	-	Note1 Note3
Response Time		T_{ON}	25° C	-	30	35	ms	Note1 Note4
		T_{OFF}		-	30	35		
Chromaticity	White	X_W	Backlight is on	0.288	0.318	0.348	-	Note1 Note5
		Y_W		0.301	0.331	0.361	-	
	Red	X_R		0.618	0.647	0.677	-	
		Y_R		0.292	0.322	0.352	-	
	Green	X_G		0.253	0.283	0.313	-	
		Y_G		0.535	0.565	0.595	-	
	Blue	X_B		0.105	0.135	0.165	-	
		Y_B		0.111	0.141	0.171	-	
Uniformity		U		75	80	-	%	Note1 Note6
NTSC				55	60	-	%	Note5
Luminance		L		300	350	-	cd/m2	Note1 Note7

Test Conditions:
1. IF= 20Ma (one channel),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	BM-7A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	SR-3A	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).

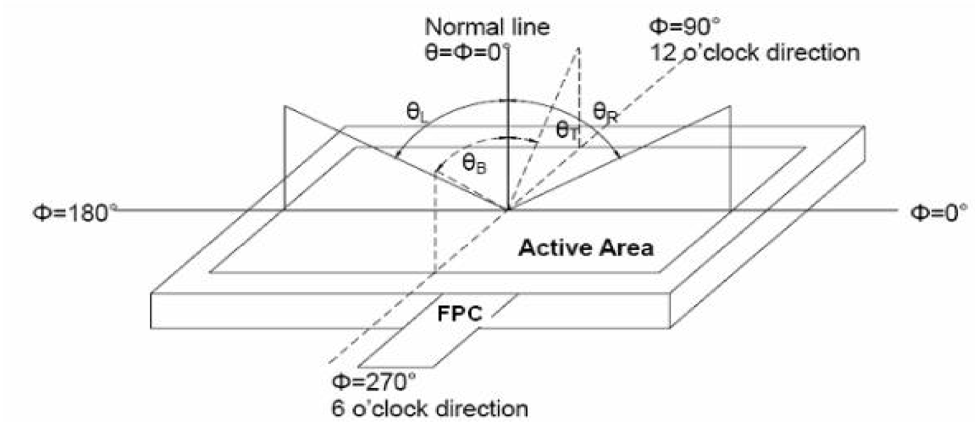


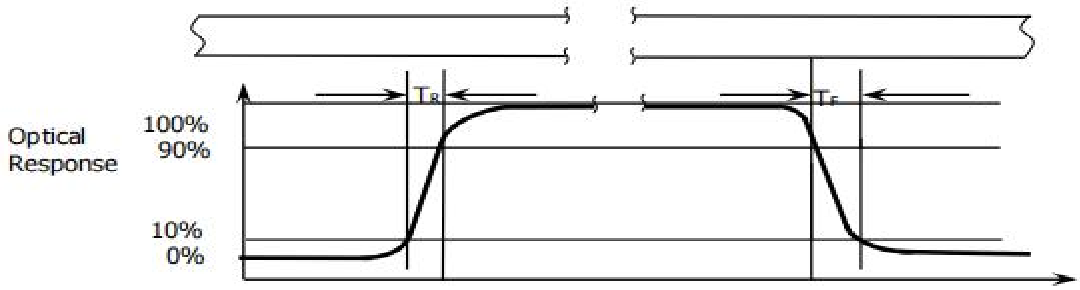
Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

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



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 X100%

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

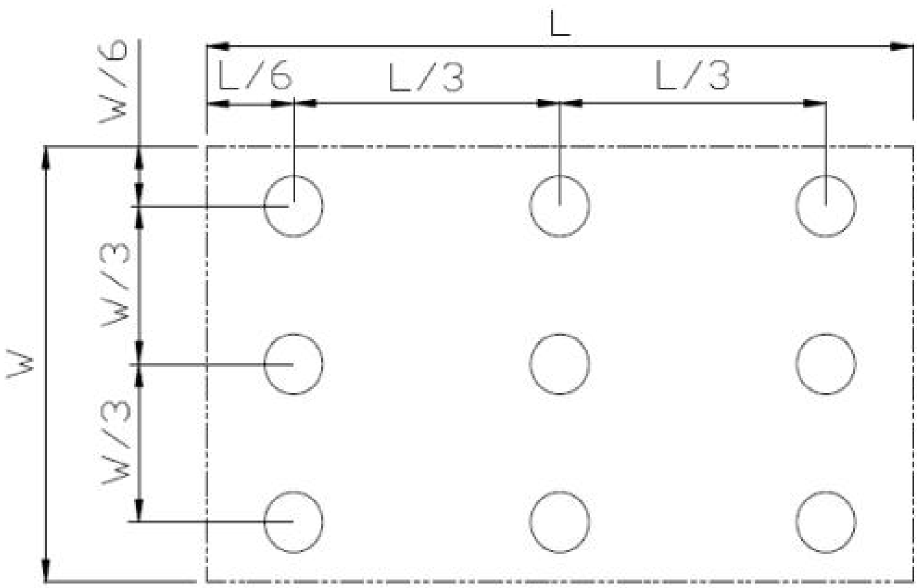


Fig. 2 Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.

Lmin: The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance:

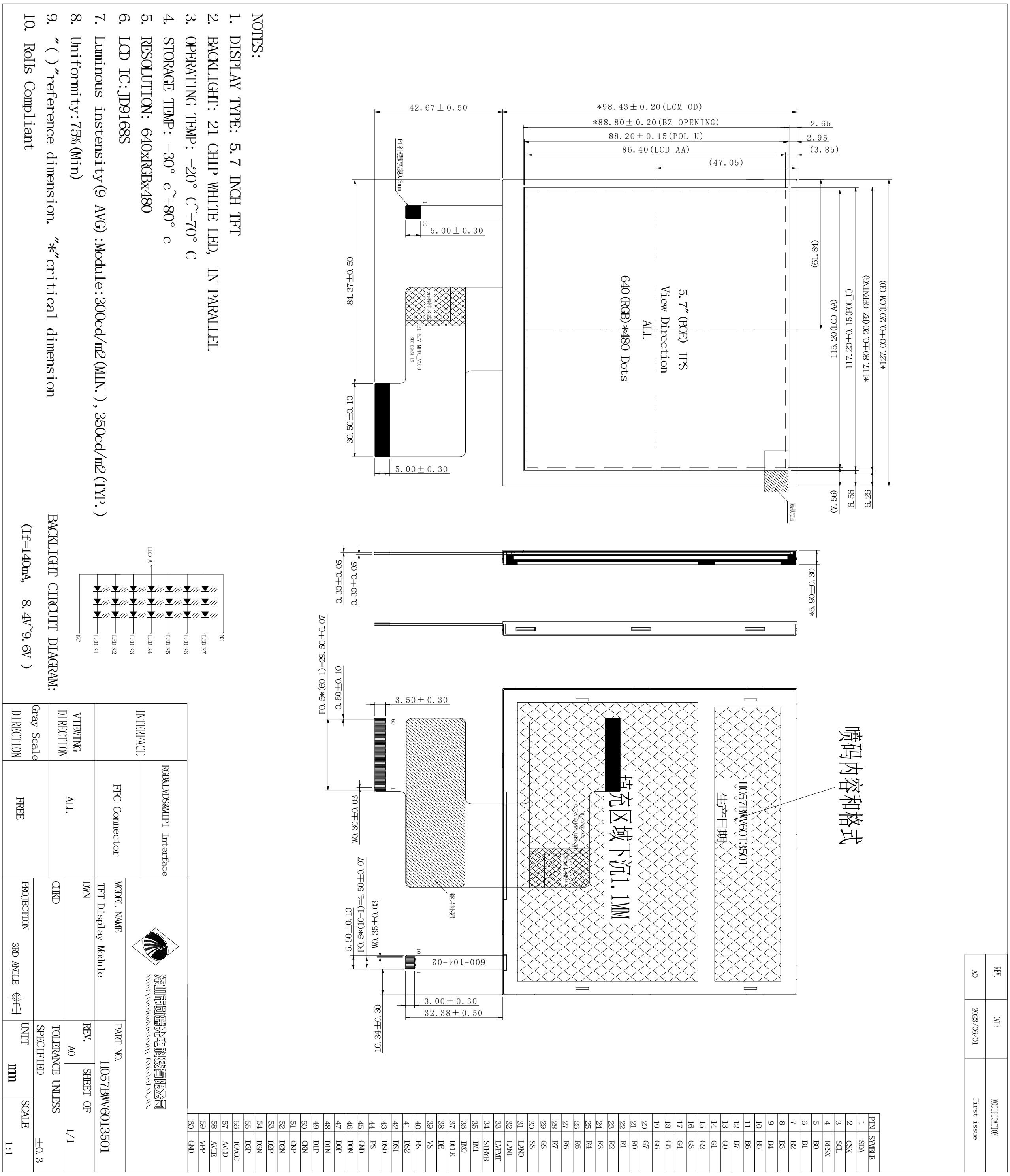
Measure the luminance of white state at center point.

8 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70℃, 96hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	Ta= -20℃, 96hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 96hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30℃, 96hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 96 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 20 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Operation)	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: 60 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



1 0.Packing

TBD

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 ； Ketene ； 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.