深圳显旸光电科技有限公司
Shenzhen Xianyang Optoelectronic Technology Co., Ltd

PRODUCTION SPECIFICATION OF LCD MODULE

MODULE NO.： XY067BHW8683ANT

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

Prepared By	Checked By	Approved By

. Revision Record

Date	Rev.No.	Page	Revision Items	Prepared
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1. General Specifications

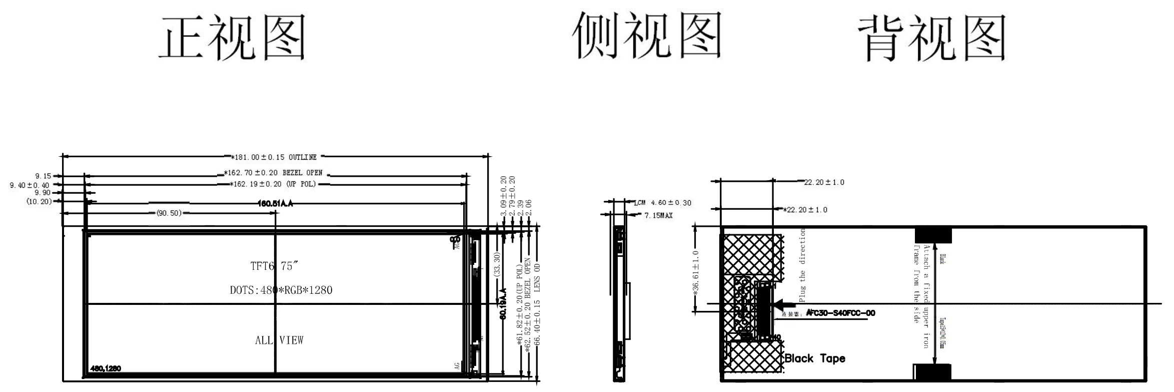
Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16M		1
Viewing Direction	ALL	O'clock	
Operating temperature	-20~+70	℃	
Storage temperature	-30~+80	℃	
Module size	66.6*181.0*4.6	mm	2
Active Area(W×H)	60.19*160.51	mm	
Number of Dots	480×RGB×1280	dots	
Power Supply Voltage	3.3	V	
Backlight	12-LEDs (white)	pcs	
Brightness(LCM)	520(TYP)	cd/m^2	TYP
Data Transfer	MIPI	-	
LCM Connector Type	AFC30-S40FCC-00	**0.5PITCH 40pin**	
Driver IC	FL7707		

Note 1: Color tune is slightly changed by temperature and driving voltage.

Note 2: Without FPC and Solder.

2. Outline.Drawing

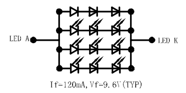
深圳市显旸光电科技有限公司	DESIGN:(设计)	CHECKED:(检查)	APPROVED:(批准)	SPECIFICATION	规　格	
	HOU			CUSTOMER'S CODE:(客户型号)		EDITION:(版本号)
Date:(日期) 2023.06.29	Page:(页数)	1/1	图纸视角:⊕◁	XY'S CODE:(显旸料号)	XY067BHW8683ANT	EDITION:(版本号) 01


正视图
侧视图
背视图
*181.00±0.15 OUTLINE
*162.70±0.20 BEZEL OPEN
*162.19±0.20 (UP POL)
160.51A.A
(90.50)
9.15
9.40±0.40
9.90
(10.20)
TFT6.75"
DOTS:480*RGB*1280
ALL VIEW
480,1280
AG
3.09±0.20
2.79±0.20
2.39
2.06
(33.30)
60.15A.A
*61.82±0.20(UP POL)
*62.52±0.20 BEZEL OPEN
66.40±0.15 LENS OD
LCM 4.60±0.30
7.15MAX
22.20±1.0
*22.20±1.0
*36.61±1.0
Plug the direction
连接器: AFC30-S40FCC-00
Black Tape
Attach a fixed upper iron frame from the side
Black
Tape

1	GND
2	D0P
3	D0N
4	GND
5	D1P
6	D1N
7	GND
8	CLKP
9	CLKN
10	GND
11	D2P
12	D2N
13	GND
14	D3P
15	D3N
16	GND
17	GND
18	VCC-1V8
19	VCC-1V8
20	REFCLK/NC
21	SDA
22	SCL
23	BIST
24	RSTB
25	STBYB
26	AVDD/NC
27	GND
28	K
29	K
30	GND
31	VGL/NC
32	GND
33	GND
34	VGH/NC
35	A
36	A
37	GND
38	VDD-3V3
39	VDD-3V3
40	VCOM/NC

Luminance:520nits

LED service life:50,000 Hours


LED A
LED K
If=120mA, Vf=9.6V(TYP)

Backlit circuit diagram

1. Unit:mm.
2. ⚠ Modification rev. number.
3. All radii without dimension R0.3mm.
4. All draft angles to be 1.5°
5. Unspecified Tolerances is :±0.20mm.
6. Driver IC:FL7707
7. Display Type:6.86 TFT
8. Operating Temperature : -20° -- +70° C
9. Storage Temperature : -30° -- +80° C
10. Requirements on Environmental Protection: ROHS HSF

标示	日　期	更改内容	签　署

Customer Name: 客户名称		Approval Date: 承认日期		Approved By: 承认		Please Confirm This Drawing On/Before 请 签 回 此 图	

3 Interface signals

Pin No.	Symbol	Function
1	GND	Ground
2	D0P	MIPI Data lane0 input （positive）
3	D0N	MIPI Data lane0 input (negative)
4	GND	Ground
5	D1P	MIPI Data lane1 input（positive）
6	D1N	MIPI Data lane1 input(negative)
7	GND	Ground
8	CLKP	MIPI CLK input （positive）
9	CLKN	MIPI CLK input (negative)
10	GND	Ground
11	D2P	MIPI Data lane2 input（positive）
12	D2N	MIPI Data lane2 input (negative)
13	GND	Ground
14	D3P	MIPI Data lane3 input（positive）
15	D3N	MIPI Data lane3 input (negative)
16-17	GND	Ground
18-19	VCC-1V8	IO Power Supply(1.65V~3.6V)
20	REFCLK/NC	NC
21	SDA/NC	NC
22	SCL/NC	NC
23	BIST/NC	NC
24	RSTB	global reset pin. Active low to enter reset state. suggest to connecting with an RC reset circuit for stability. Normally pull high.
25	STBYB	NC
26	AVDD/NC	NC
27	GND	Ground
28-29	K	Backlight LED Ground
30	GND	Ground
31	VGL/NC	NC
32-33	GND	Ground
34	VGH/NC	NC
35-36	A	Backlight LED Power
38-39	VDD-3V3	Power Supply(3.3~3.6V)
40	VCOM/NC	NC

4. Absolute Maximum Ratings(Ta=25℃)

4.1 Electrical Absolute Maximum Ratings.(Vss=0V ,Ta=25℃)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply	VDD	Ta=25℃	-	3.3	-	V	
Gate On Power Supply Voltage	VGH		-	15	-	V	
Gate Off Power Supply Voltage	VGL		-	-11	-	V	

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also eXYeeded, the

   module will malfunction and cause poor reliability.
2. $V_{CC} > V_{SS}$ must be maintained.
3. Please be sure users are grounded when handing LCD Module

4.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	80℃	-20℃	70℃	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.
2. Background color changes slightly depending on ambient temperature.

   The phenomenon is reversible.
3. Ta<=60℃:85%RH MAX.

   Ta>=60℃:Absolute humidity must be lower than the humidity of 85%RH at 40℃.

5. Electrical Specifications and Instruction Code

5.1 Electrical characteristics(Vss=0V ,Ta=25℃)

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply		VDD	Ta=25℃	-	3.3	3.6	V	
Power supply		IOVCC	Ta=25℃	-	1.8	-	V	
Input voltage	'H'	V_{IH}	V_{IOVCC}= 1.8V	0.8V_{IOVCC}	-	V_{IOVCC}	V	
	'L'	V_{IL}	V_{IOVCC}= 1.8V	0	-	0.2V_{IOVCC}	V	

Note:

1:When an optimum contrast is obtained in transmissive mode.

2: Tested in 1×1 chessboard pattern.

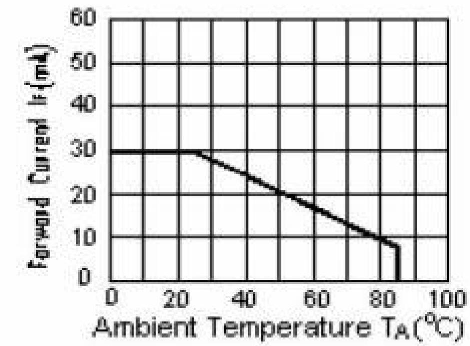
5.2 LED backlight specification(VSS=0V ,Ta=25℃)

Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage		-	-	-	9.6	-	V	1
Supply current		I_f	-	-	120	-	mA	2
Forward current	Normal	I_{pn}	3-chip series x 4	-		-	mA	
	Dimming	I_{pd}		-	-	-		
LED LIFE		-	-	-	20000	-	Hrs	

Note:

1: V_{LED}=V_{LED}(+)-V_{LED}(-).

2:The current of LED is 20mA.
A LED drive in constant current mode is recommended.



6. Optical Characteristics

Item	Symbol	**Condition**	Min.	Typ.	Max.	Unit	Note
Brightness	Bp	θ=0° Φ=0°	460	520	-	cd/m^2	1
Uniformity	⊿Bp		75	80	-	%	1,2
Viewing Angle	3:00	Cr≥10	70	80	-	Deg	3
	6:00		70	80	-		
	9:00		70	80	-		
	12:00		70	80	-		
Contrast Ratio	Cr	θ=0° Φ=0°	1000	1500		-	4
Response Time	T_r+T_f		25	35	-	ms	5
Color of CIE Coordinate	W x	θ=0° Φ=0°	-0.03	0.292	+0.03	-	1,6
	W y		-0.03	0.331	+0.03	-	
	R x		-0.03	0.660	+0.03	-	
	R y		-0.03	0.324	+0.03	-	
	G x		-0.03	0.257	+0.03	-	
	G y		-0.03	0.582	+0.03	-	
	B x		-0.03	0.134	+0.03	-	
	B y		-0.03	0.121	+0.03	-	
NTSC Ratio	S		-	70	-	%	

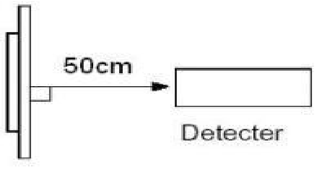
Note：The parameter is slightly changed by temperature, driving voltage and materiel

Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white. The brightness is the average value of 9 measured spots. Measurement equipment BM-7 (Φ7.5mm)

Measuring condition:

- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- Adjust operating voltage to get optimum contrast at the center of the display.

Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.

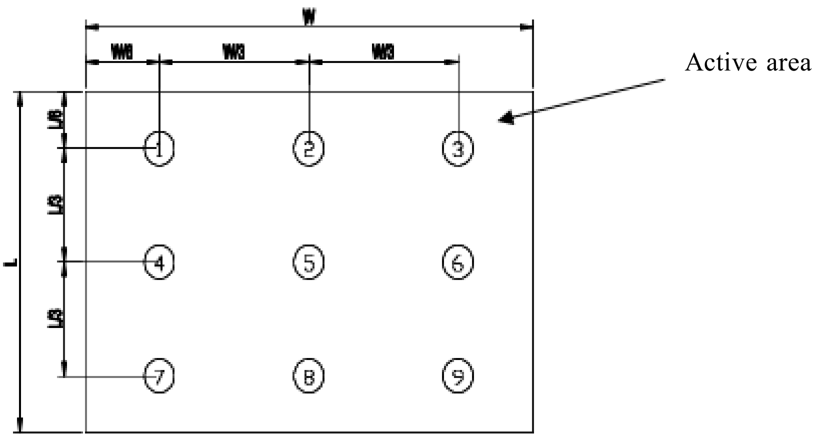

50cm
Detecter

Note 2: The luminance uniformity is calculated by using following formula.

⊿Bp = Bp (Min.) / Bp (Max.) × 100 (%)

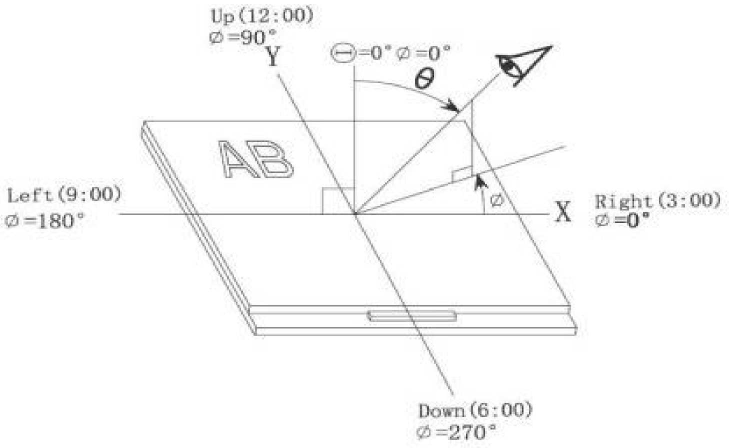
Bp (Max.) = Maximum brightness in 9 measured spots

Bp (Min.) = Minimum brightness in 9 measured spots.

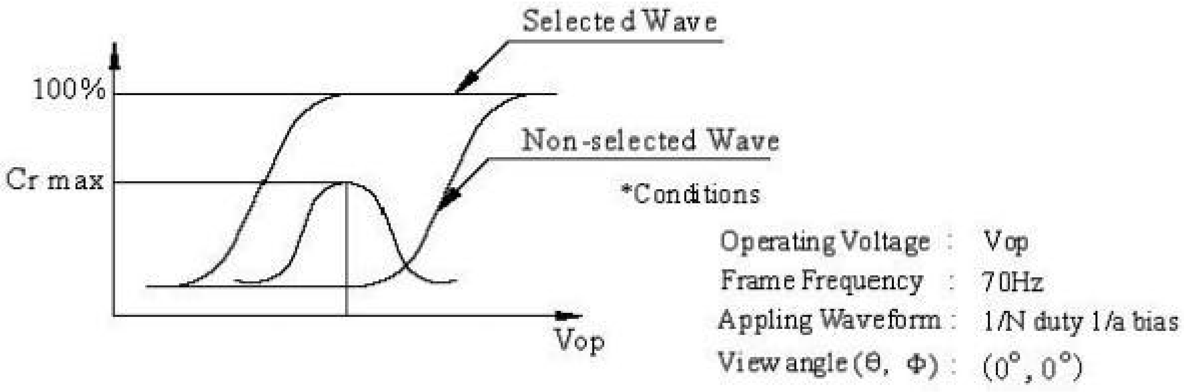

W
W/6
W/3
W/3
Active area
L
L/6
L/3
L/3
①
②
③
④
⑤
⑥
⑦
⑧
⑨

Note 3: The definition of viewing angle:

Refer to the graph below marked by θ and Φ



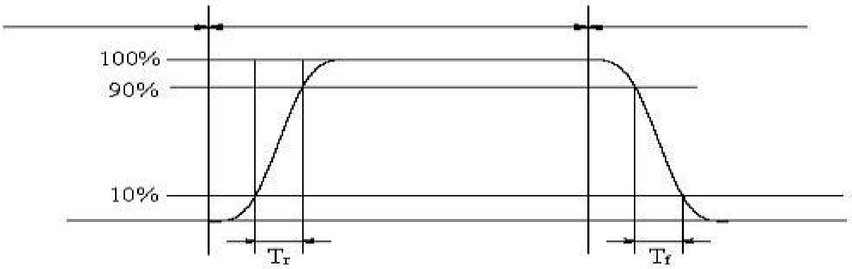
Note 4: Definition of contrast ratio.(Test LCD using DMS501)



$$Contrast\ ratio(Cr) = \frac{Brightness\ of\ selected\ dots}{Brightness\ of\ non-selected\ dots}$$

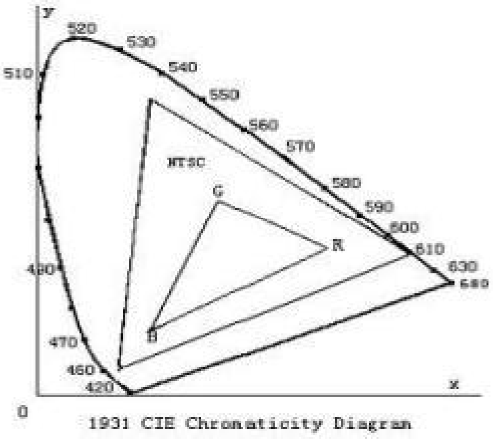
Note 5: Definition of Response time. (Test LCD using DMS501):

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes.Refer to figure as below.


100%
90%
10%
Tr
Tf

The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.

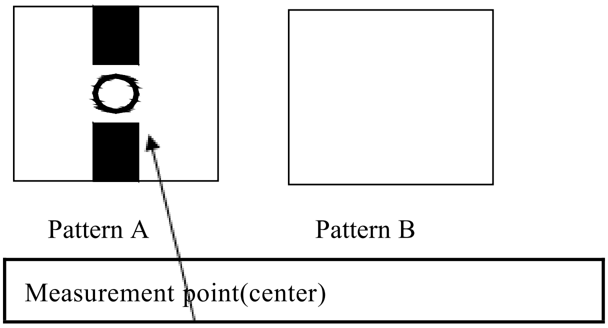

y
520
530
540
550
560
570
580
590
600
610
630
680
510
490
470
460
420
0
x
NTSC
G
R
B
1931 CIE Chromaticity Diagram

Color gamut:

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \text{根} \, 100\%$$

Note 7: Definition of cross talk.

Cross talk ratio(%)= ｜pattern A Brightness-pattern B Brightness ｜/pattern A Brightness*100


Pattern A
Pattern B
Measurement point(center)

Electric volume value=3F+/-3Hex

7. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80℃±2℃ 96H Restore 2H at 25℃ Power off	1. After testing, cosmetic and electrical defects should not happen. 2. Total current consumption should not be more than twice of initial value.
2	Low Temperature Storage	-30℃±2℃ 96H Restore 2H at 25℃ Power off	
3	High Temperature Operation	70℃±2℃ 96H Restore 2H at 25℃ Power on	
4	Low Temperature Operation	-20℃±2℃ 96H Restore 4H at 25℃ Power on	
5	High Temperature/Humidity Operation	60℃±2℃ 90%RH 96H Power on	
6	Temperature Cycle	–30℃←————————→80℃ 30min 5min 30min after 5 cycle, Restore 2H at 25℃ Power off	
7	Vibration Test	10Hz~150Hz, 100m/s^2, 120min	Not allowed cosmetic and electrical defects.
8	Shock Test	Half- sine wave,300m/s^2,11ms	
9	ESD Test	Air discharge:+/-8KV, Contact discharge:+/-4KV	

Note: Operation: Supply 2.8V for logic system.

The inspection terms after reliability test, as below

ITEM	Inspection
Contrast	CR>50%
IDD	IDD<200%
Brightness	Brightness>60%
Color Tone	Color Tone+/-0,05

8 Quality level

As Quality department <<Product Cosmetic SPEC>>.

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

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

9.1.2 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.

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

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

9.1.5 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

9.1.6 Do not attempt to disassemble the LCD Module.

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

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

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

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

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

d. 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.

9.2 Storage precautions

9.2. 1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 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℃ ~ 60℃

Relatively humidity: ≤80%

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

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