深圳市智诚光电发展有限公司

LCD MODULE
SPECIFICATION

Customer: _____

Model Name: **ZC057FIA00**

Date: **2022/11/24**

Version: **01**

☐ Preliminary Specification

■ Final Specification

Remark

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

Record of Revision

Version	Revise Date	Page	Content
Pre-spec.01	2022/11/24		Initial Release.

1. General Specifications

The ZC057FIA00 is a 5.7 inch LCD,The resolution of the panel is 1920(RGB)*1080 pixels and can display up to 16.7M color

No.	Item	Specification	Remark
1	LCD size	5.7 inch(Digital)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1920 × RGB ×1080	
4	Display mode	Normally Black	
5	Dot pitch	0.02191(W) × 0.06573(H) mm	
6	Active area	126.20(W) × 70.99(H) mm	
7	Module size	148.00(W) ×98.15(H) × 6.38(D) mm	
8	Surface treatment	Hard Coating	
9	Color arrangement	RGB-stripe	
10	Interface	MIPI	
11	Backlight Power consumption		
12	Panel Power consumption		
13	Weight		

2. Pin Assignment

2.1. TFT LCD Panel Driving Section

FPC connector is used for the module electronics interface. "

Pin No.	Symbol	I/O	Function	Remark
1	V_{LED+}	P	Power for LED backlight anode	
2	V_{LED+}	P	Power for LED backlight anode	
3	V_{LED+}	P	Power for LED backlight anode	
4	NC	-	No connection	
5	V_{LED-}	P	Power for LED backlight cathode	
6	V_{LED-}	P	Power for LED backlight cathode	
7	V_{LED-}	P	Power for LED backlight cathode	
8	GND	P	Power Ground	
9	GND	P	Power Ground	
10	GND	P	Power Ground	
11	VCC	P	Powersupply3.3/5V	
12	VCC	P	Powersupply3.3/5V	
13	GND	P	Power Ground	
14	GND	P	Power Ground	
15	GND	P	Power Ground	
16	MIPI-3N	I	MIPI Data negative signal	
17	MIPI-3P	I	MIPI Data Positive signal	
18	GND	P	Power Ground	
19	MIPI-0N	I	MIPI Data negative signal	
20	MIPI-0P	I	MIPI Data Positive signal	

21	GND	P	Power Ground	
22	MIPI-CLKN	I	MIPI CLK negative signal	
23	MIPI-CLKP	I	MIPI CLK Positive signal	
24	GND	P	Power Ground	
25	MIPI-1N	I	MIPI Data negative signal	
26	MIPI-1P	I	MIPI Data Positive signal	
27	GND	P	Power Ground	
28	MIPI-2N	I	MIPI Data negative signal	
29	MIPI-2P	I	MIPI Data Positive signal	
30	GND	P	Power Ground	
31	BKLTCT	P		
32	NC	-	No connection	
33	MIPI PWM	O		
34	BKLTEN	P	Powersupply3.3V	
35	DSI-RST	P	Powersupply3.3V	
36	NC	-	No connection	
37	VCC	P	Powersupply1.8V	
38	VCC	P	Powersupply3.3V	
39	VCC	P	Powersupply3.3V	
40	VCC	P	Powersupply3.3V	

3. Operation Specifications

3.1. Absolute Maximum Ratings

4.

| Item	Symbol	Values			Unit	Remark
		Min.	**Typ.**	**Max.**		
Power voltage	VDD	3.0	3.3	5.0	V	
Input logic high voltage	V_{IH}	0.7 VDD	-	VCCS	V	
Input logic low voltage	V_{IL}	0	-	0.3 DV_{DD}	V	

Low Power Mode

DSI-CLK+/- lanes can be driven to the Low Power Mode (LMP),when DSI-CLK lanes are entering

LP-11 State Code , in three different ways:

After SW Reset, HW Reset or Power On Sequence=>LP-11

After DSI-CLK+/- lanes are leaving Ultra Low Power Mode (ULPM,LP-00 State Code)=>LP10=>LP-11(LPM).
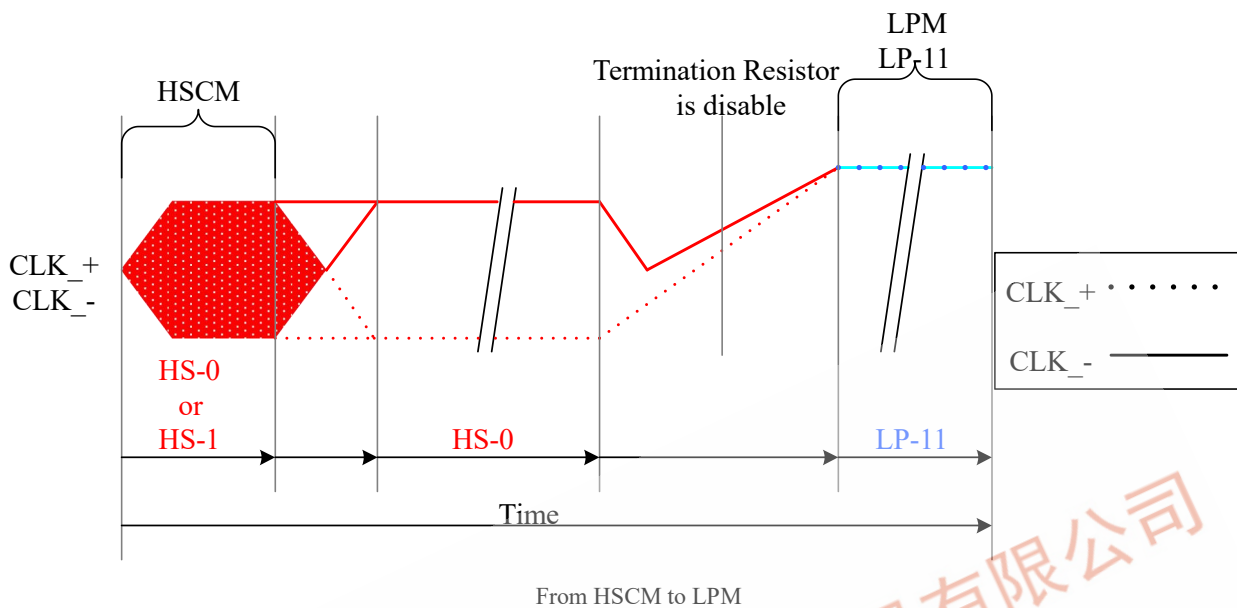
This sequence is illustrated below.
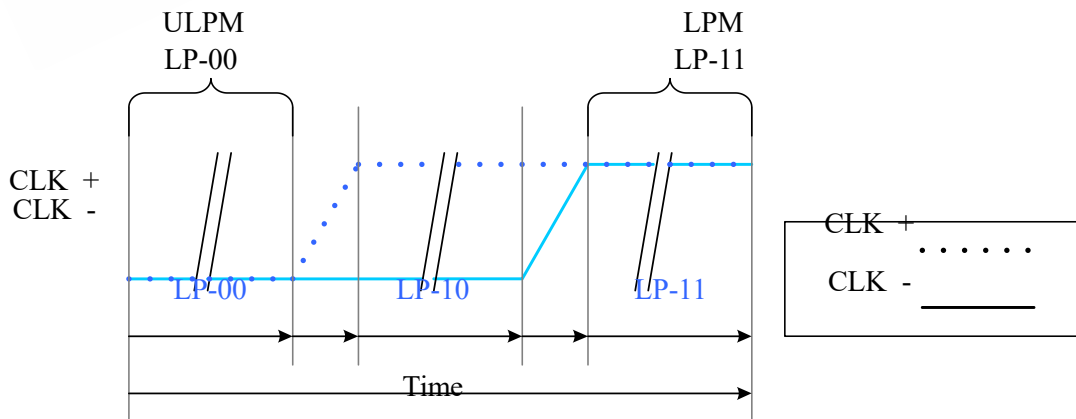
From ULPM to LPM

After DSI-CLK+/- lanes are leaving High Speed Clock Mode (HSCM, HS-0 or HS-1 State Code) =>HS-0 =>LP-11 (LPM).

This sequence is illustrated below.

From HSCM to LPM

All three mode changes are illustrated a flow chart below.

# High-Speed Clock Mode (HSCM)

DSI-CLK+/- lanes can be driven to the High Speed Clock Mode (HSCM), when DSI-CLK lanes are starting to work between HS-0 and HS-1 State Codes.
The only entering possibility is from the Low Power Mode (LPM, LP-11 State Code) =>LP-01 =>LP-00 =>HS-0 =>HS-0/1 (HSCM).

From LPM t
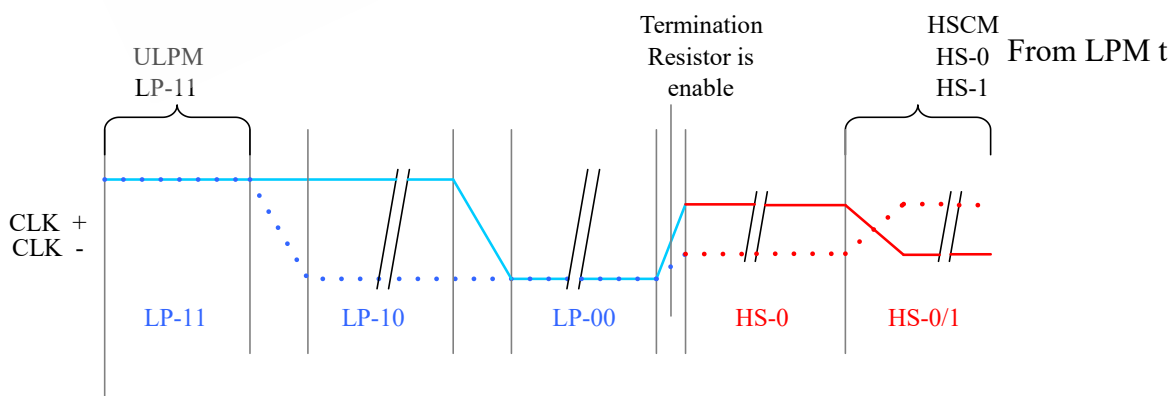
he high speed clock (DSI-CLK+/-) is started before high speed data is sent via DSI-Dn+/- lanes. The high speed clock continues clocking after the high speed data sending has been

stopped.
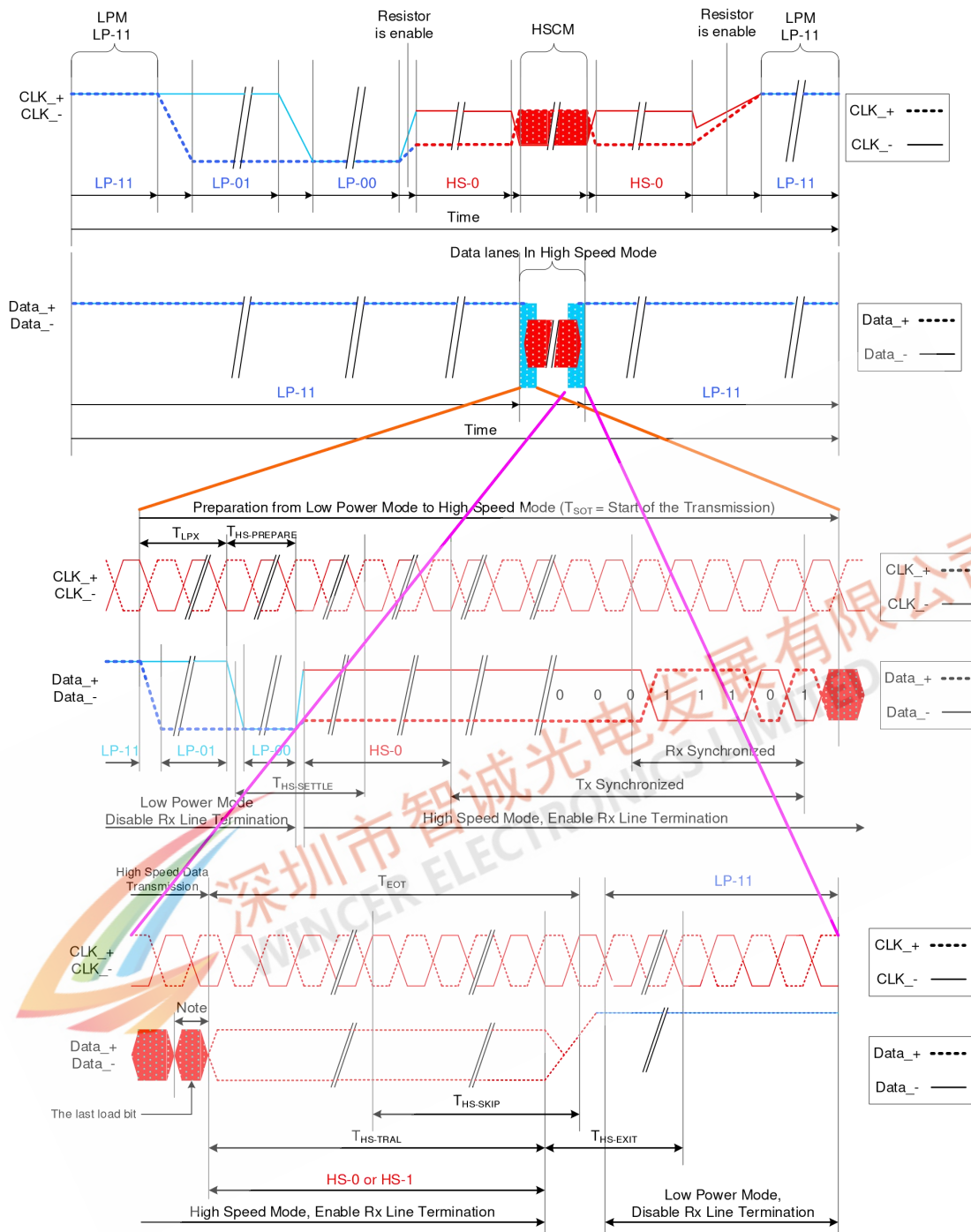
3.2 Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V_L	9.2	9.6	9.9	V	Note 2
Current for LED Backlight	I_L	–	180	–	mA	
LED life time	-	20,000	-	-	Hr	Note 1

Note 1: The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is 25℃ and I_L =180mA. The LED lifetime could be decreased if operating I_L is lager than 180 mA.

Note 2: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and I_L =180mA.

4. CTP+Coverlens Specification

Item 项目	CONTENTS 内容	Unit 单位
Outline Dimension 外形尺寸	148.00*98.15	mm
Touch Active Area(W*L)动作区	127.90*72.69	mm
Coverlens View Area 可视区	126.90*71.69	mm
ITO Glass thickness ITO 厚度	0.7	mm
Coverlens thickness 钢化玻璃厚度	0.7	mm
Total 总厚度	1.6	mm
Touch IC 触摸IC	GT911	--

Number of touchpoint 触点数量	5	points
跌落测试(钢球重量110g,高度20CM)表面硬度：	6H	-
Interface Type 接口方式	IIC	-
The active information. 主动笔的信息	--	--
Operation Temperature 工作温度	-20℃~70℃	℃
Storage Temperature 储存条件	常温（室内）条件；湿度 40%~70%RH（装机前）仓储不能超过 3 个月。	℃
	温度-30℃~80℃（装机后）	℃

Optical Characteristics 光学参数

Item 项目	CONTENTS 内容	Remark 备注
Transparency 透过率	>86%	--

Block diagram 功能方框图
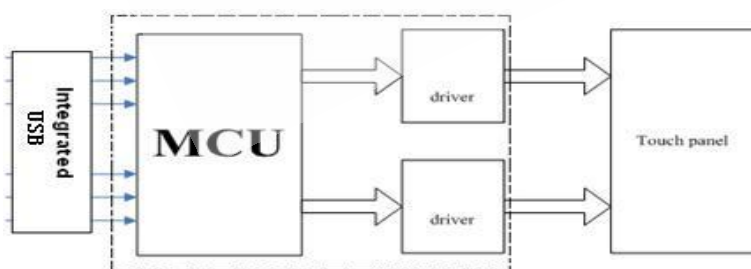
Touch panel pin assignment 引脚定义

Pin1	Symbol
1	VCC（３.３Ｖ）
2	VCC（３.３Ｖ）

3	REST
4	SCL
5	SDA
6	INT
7	NC
8	VCC（1.8V）
9	GND
10	GND

5. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180°(9 o'clock)	80	89	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	80	89	-		
	θ_T	Φ=90°(12 o'clock)	80	89	-		
	θ_B	Φ=270°(6 o'clock)	80	89	-		
Response time	T_{ON}		-	10	20	msec	Note 3
	T_{OFF}		-	15	30	msec	Note 3
Contrast ratio	CR		1000	1500	-	-	Note 4
Color chromaticity	W_X	Normal θ=Φ=0°	0.27	0.31	0.35	-	Note 2 Note 5 Note 6
	W_Y		0.29	0.33	0.37	-	
	R_X		0.52	0.56	0.60	-	
	R_Y		0.29	0.33	0.37	-	
	G_X		0.30	0.34	0.38	-	

			0.55	0.59	0.63	-	
	G_Y						
	B_X		0.10	0.14	0.18	-	
	B_Y		0.04	0.08	0.12	-	
Luminance	L		300	350	-	cd/m²	Note 6
Luminance uniformity	Y_U		75	80	-	%	Note 7
NTSC			53	58	-	%	

Test Conditions:

1. I_L=180mA (Backlight current), the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range
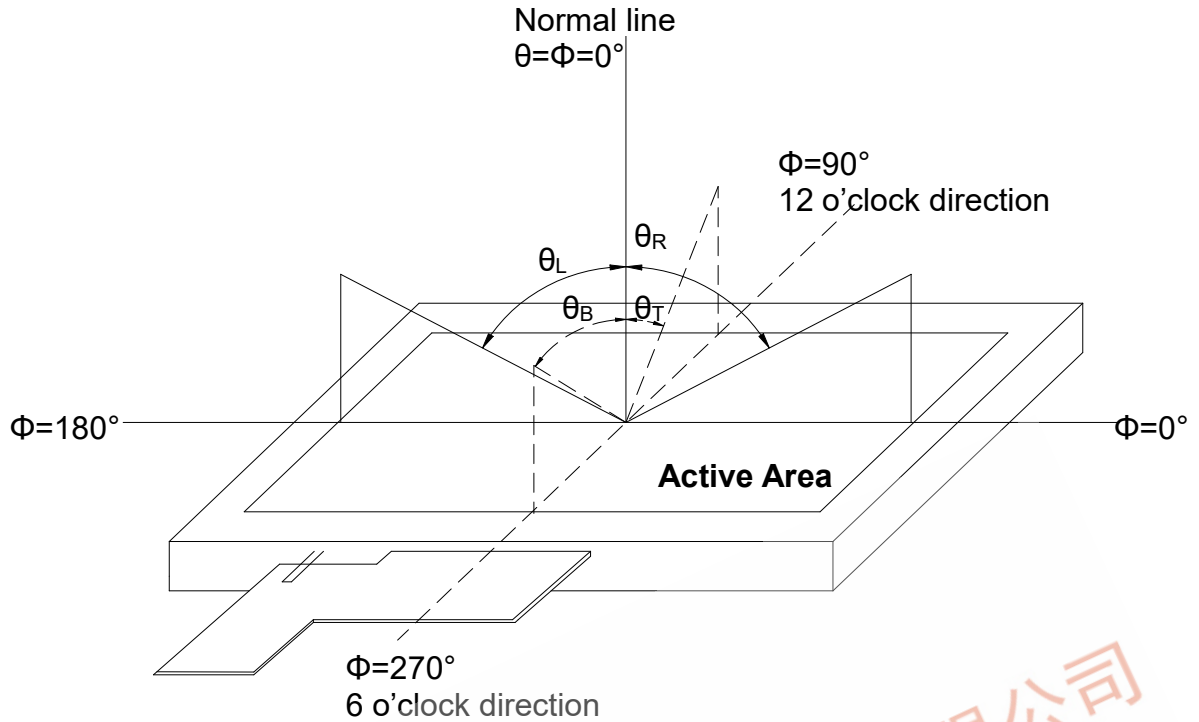
Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.
The optical characteristics should be measured in dark room. After 10 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)
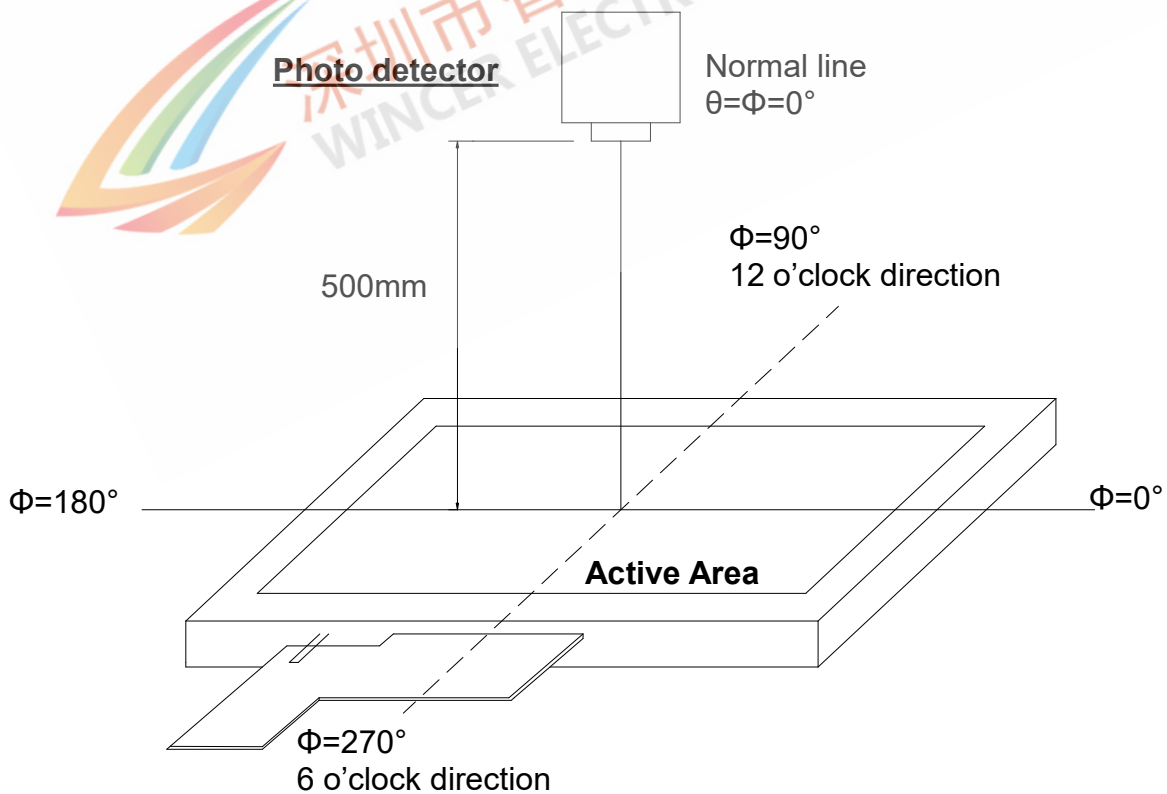

Fig. 4-2 Optical measurement system setup

Note 3: 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%.
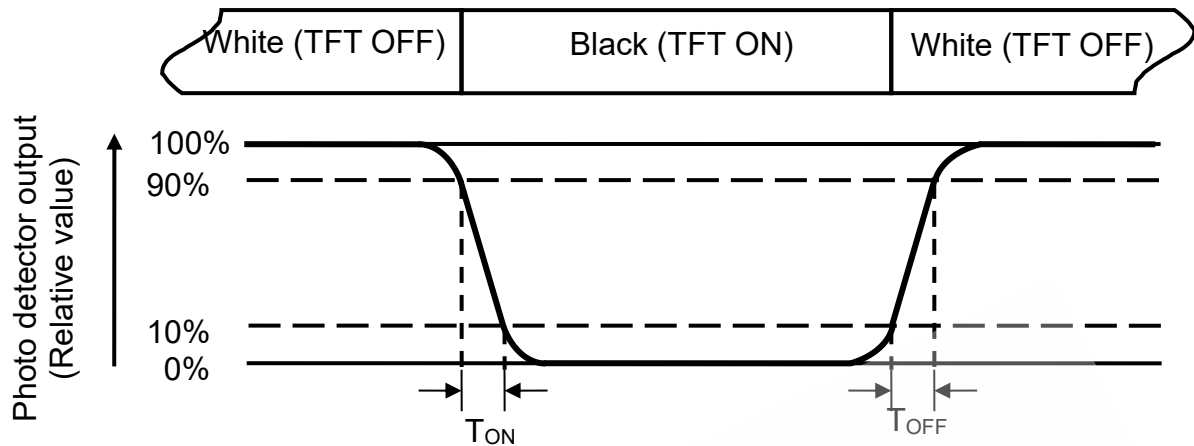
Fig. 4-3 Definition of response time

Note 4: Definition of contrast ratio

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

Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance

$$Luminance = \frac{Summation\ of\ the\ 9\ measuring\ point\ Luminance}{9}$$

This shall be measured on the 9 measuring point as shown in the Fig.4-4. The LED driving condition is $I_L=40mA$.

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).Every measuring point is placed at the center of each measuring area.

$$Luminance\ \ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$

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

Fig. 4- 4 Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.
B_{min}: The measured minimum luminance of all measurement position.

Note 8: Measured the center of panel by Photo detector K8.

Fig. 4- 5 Definition of flicker

6. Reliability Test Items

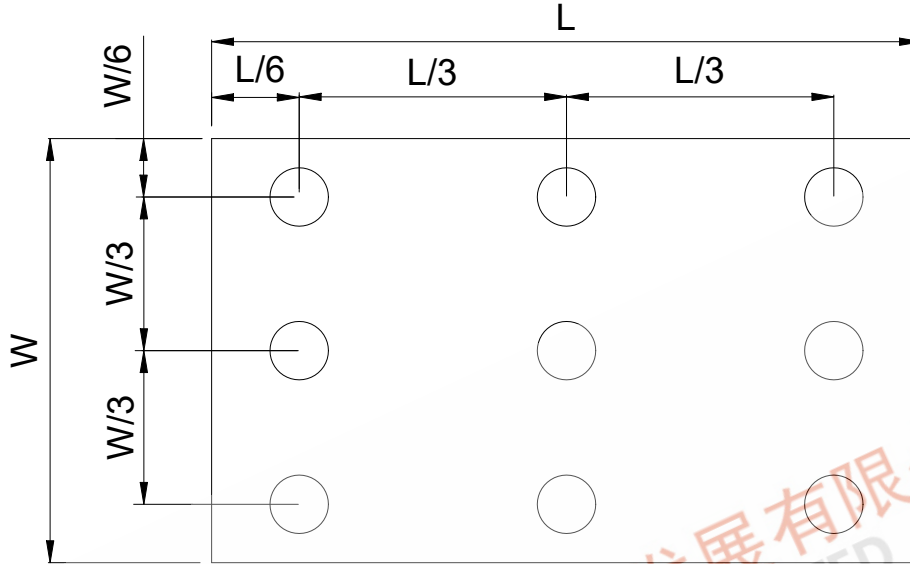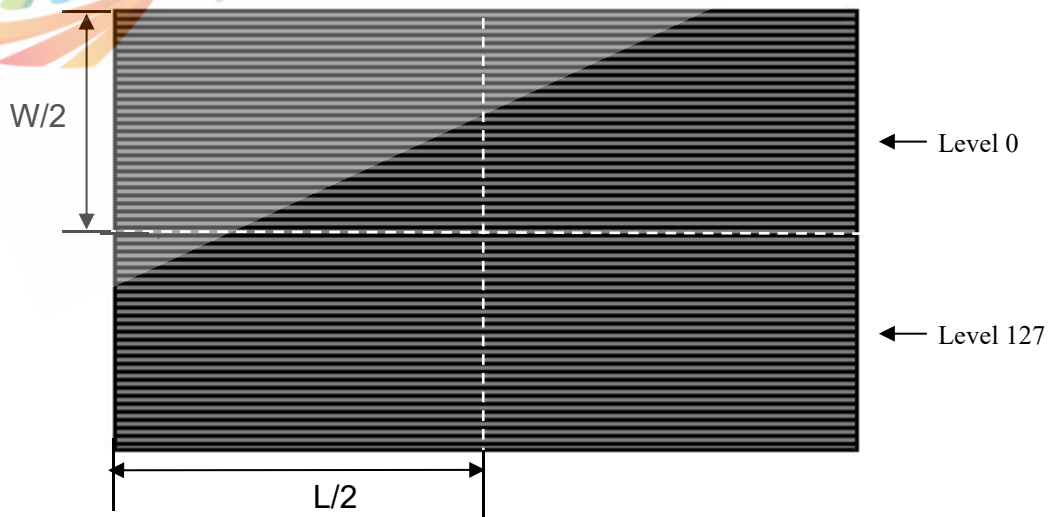| Item	Test Conditions		Remark
High Temperature Storage	Ta = 80℃	24hrs	Note 1,Note 4
Low Temperature Storage	Ta = -30℃	24hrs	Note 1,Note 4
High Temperature Operation	Ts = 70℃	24hrs	Note 2,Note 6
	Ts = 70℃	24hrs	Note 2,Note 7
Low Temperature Operation	Ta = -20℃	24hrs	Note 1,Note 4
Operate at High Temperature and Humidity	+60℃, 90%RH	24hrs	Note 5
Thermal Shock	-20℃/30 min ~ +60℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature		Note 4
Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)		
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction		
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)		
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces		
Electro Static Discharge	± 2KV, Human Body Mode, 100pF/1500Ω		

Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel's surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note 5: Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

Note 6: Before cosmetic tests, the product must have enough recovery time, at least 2 hours at room temperature.

Note 7: After the reliability test, the product only guarantees operation. Before the cosmetic and linearity of touch screen panel test, the product must have enough recovery time, at least 24 hours at room temperature.

7. General Precautions

7.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

7.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

7.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

7.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

7.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.
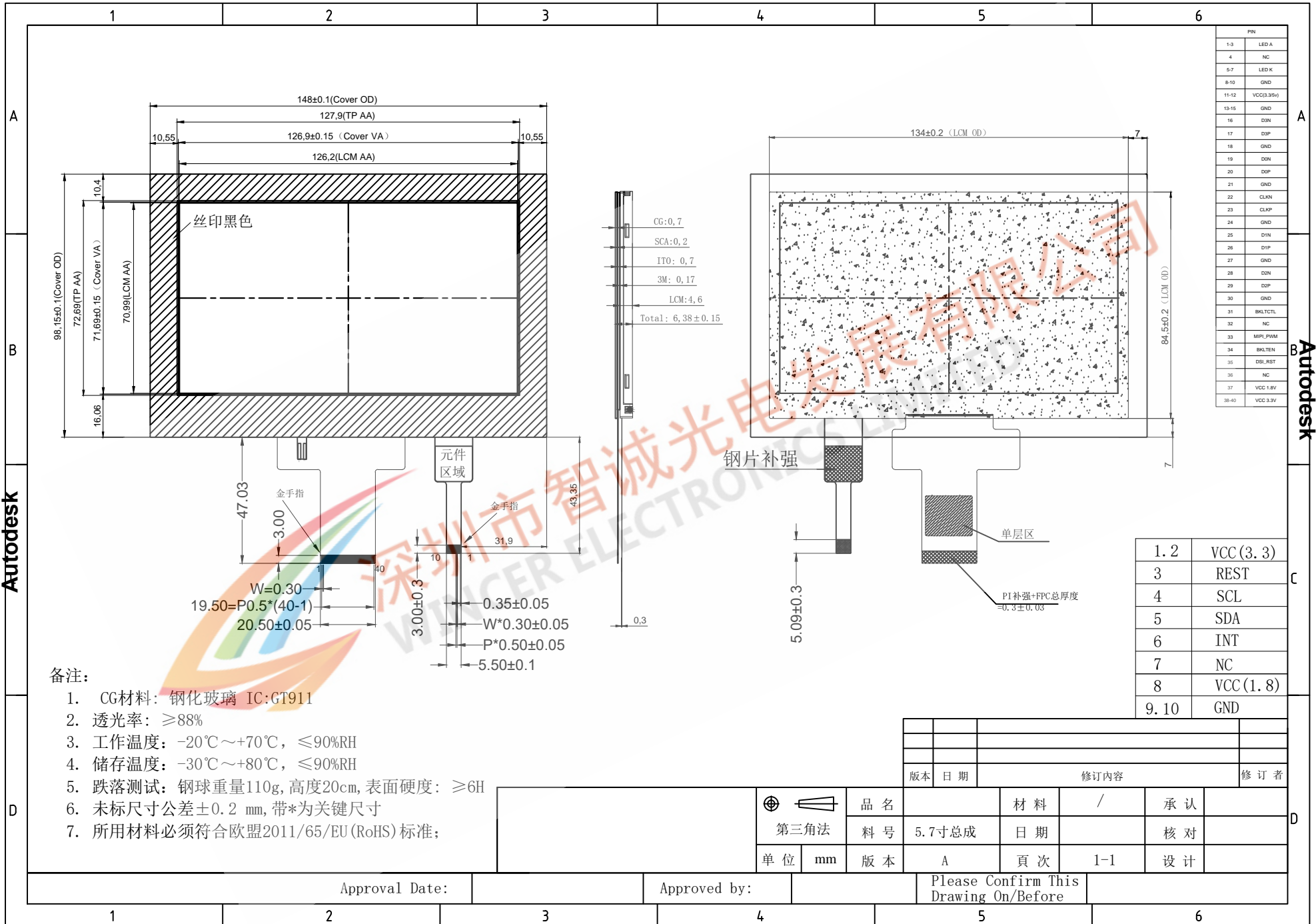
PIN	
1-3	LED A
4	NC
5-7	LED K
8-10	GND
11-12	VCC(3.3/5v)
13-15	GND
16	D3N
17	D3P
18	GND
19	D0N
20	D0P
21	GND
22	CLKN
23	CLKP
24	GND
25	D1N
26	D1P
27	GND
28	D2N
29	D2P
30	GND
31	BKLTCTL
32	NC
33	MIPI_PWM
34	BKLTEN
35	DSI_RST
36	NC
37	VCC 1.8V
38-40	VCC 3.3V

148±0.1(Cover OD)
127,9(TP AA)
126,9±0.15（Cover VA）
126,2(LCM AA)
10,55　　10,55

98.15±0.1(Cover OD)
72.69(TP AA)
71,69±0.15（Cover VA）
70,99(LCM AA)
10,4
16,06

丝印黑色

CG:0,7
SCA:0,2
ITO: 0,7
3M: 0,17
LCM:4,6
Total: 6,38±0.15

134±0.2（LCM OD）
7
84,5±0.2（LCM OD）
7

钢片补强
单层区
PI补强+FPC总厚度=0.3±0.03
5.09±0.3

元件区域
金手指
47.03
43,35
3.00
31,9
10
40
1
W=0.30
19.50=P0.5*(40-1)
20.50±0.05
金手指
3.00±0.3
0.35±0.05
W*0.30±0.05
P*0.50±0.05
5.50±0.1
0,3

1.2	VCC(3.3)
3	REST
4	SCL
5	SDA
6	INT
7	NC
8	VCC(1.8)
9.10	GND

备注：
1. CG材料：钢化玻璃 IC:GT911
2. 透光率：≥88%
3. 工作温度：-20℃～+70℃，≤90%RH
4. 储存温度：-30℃～+80℃，≤90%RH
5. 跌落测试：钢球重量110g,高度20cm,表面硬度：≥6H
6. 未标尺寸公差±0.2 mm,带*为关键尺寸
7. 所用材料必须符合欧盟2011/65/EU(RoHS)标准；

第三角法

版本	日期		修订内容		修订者

品 名		材 料	/	承 认	
料 号	5.7寸总成	日 期		核 对	
单 位	mm	版 本	A	页 次	1-1	设 计	

Approval Date:　　　Approved by:　　　Please Confirm This Drawing On/Before