PRODUCT SPECIFICATION

MODEL: ZC080IA03

< ◆> PRELIMINARY SPECIFICAION

< ◇> APPROVAL SPECIFICATION

CUSTOMER
APPROVED BY
DATE:

DESIGNED	CHECKED	APPROVED

REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2019.05.10	-	First Issued.	Jason

CONTENTS

1. GENERAL DESCRIPTION

1.1 DESCRIPTION

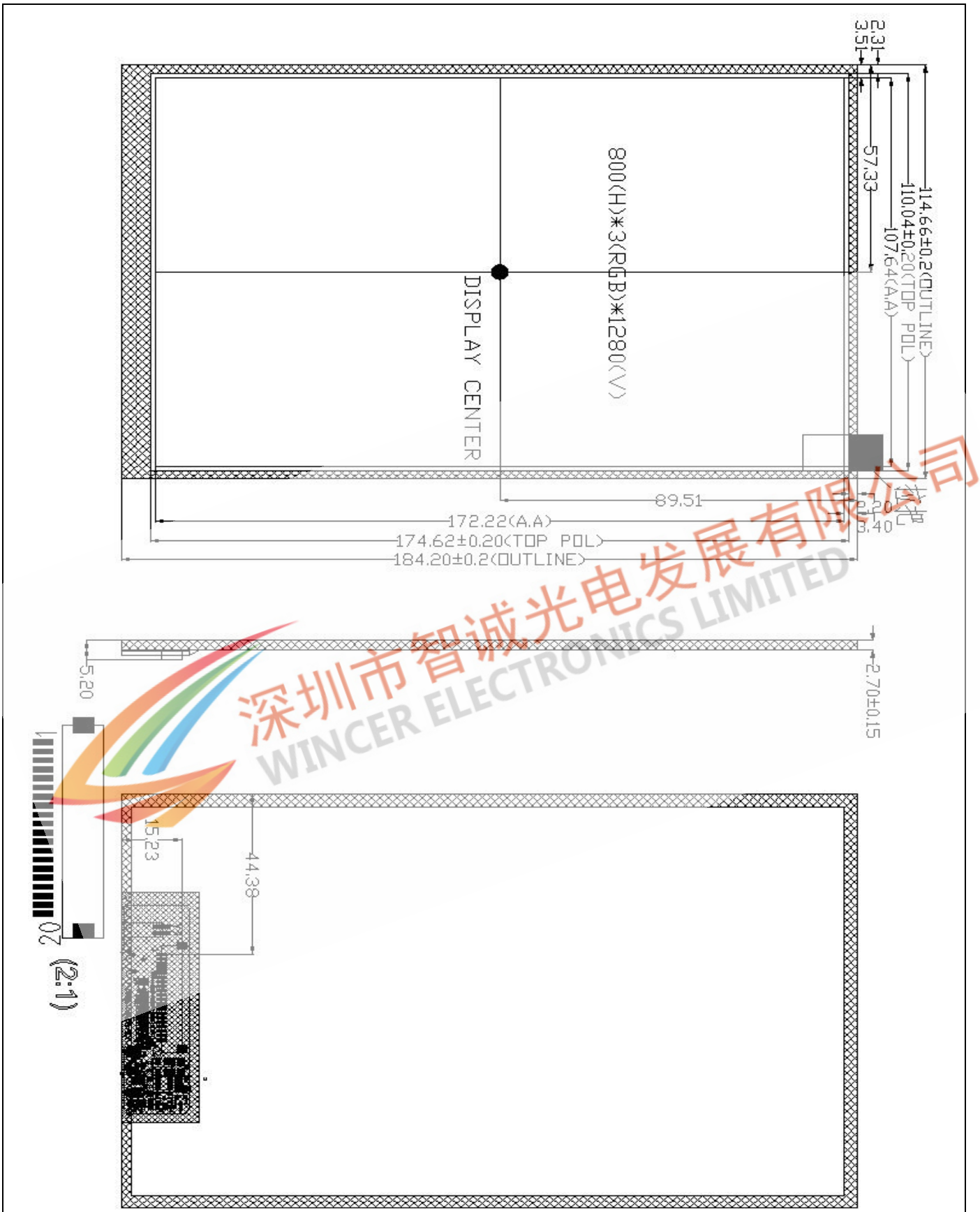
AINFULL Display model 080R1120B01 is a transmissive type color active matrix liquid crystal display (LCD) which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT LCD panel, driver ICs and a backlight unit. The following table describes the features of this LCM.

1.2 FEATURES

No.	Item	Specification	Unit
1	Panel Size	8	inch
2	Number of Pixels	800 × 3(RGB) ×1280	pixels
3	Active Area	107.64(H) ×172.224(V)	mm
4	Dot Pitch	0.13455(H) ×0.13455(V)	mm
5	Outline Dimension	114.66(H) × 184.2(V) × 2.7(D)	mm
6	Pixel arrangement	RGB Vertical stripe	-
7	Display Mode	IPS with Normally Black	-
8	Viewing Direction	ALL Viewing Direction	-
9	Display Color	16.7M	-
10	Surface Treatment	Anti-Glare and Hard-coating 3H	-
11	Interface	LVDS	-
12	Backlight	White LED	-
13	Drive IC	-	-
14	Operation Temperature	0~50	ºC
15	Storage Temperature	-20~60	ºC
16	Weight	97(Typ.)	g

2. MECHANICAL SPECIFICATION

Unit:mm



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DATE	2019-05-10	080R1120B01			
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3. PIN DESCRIPTION

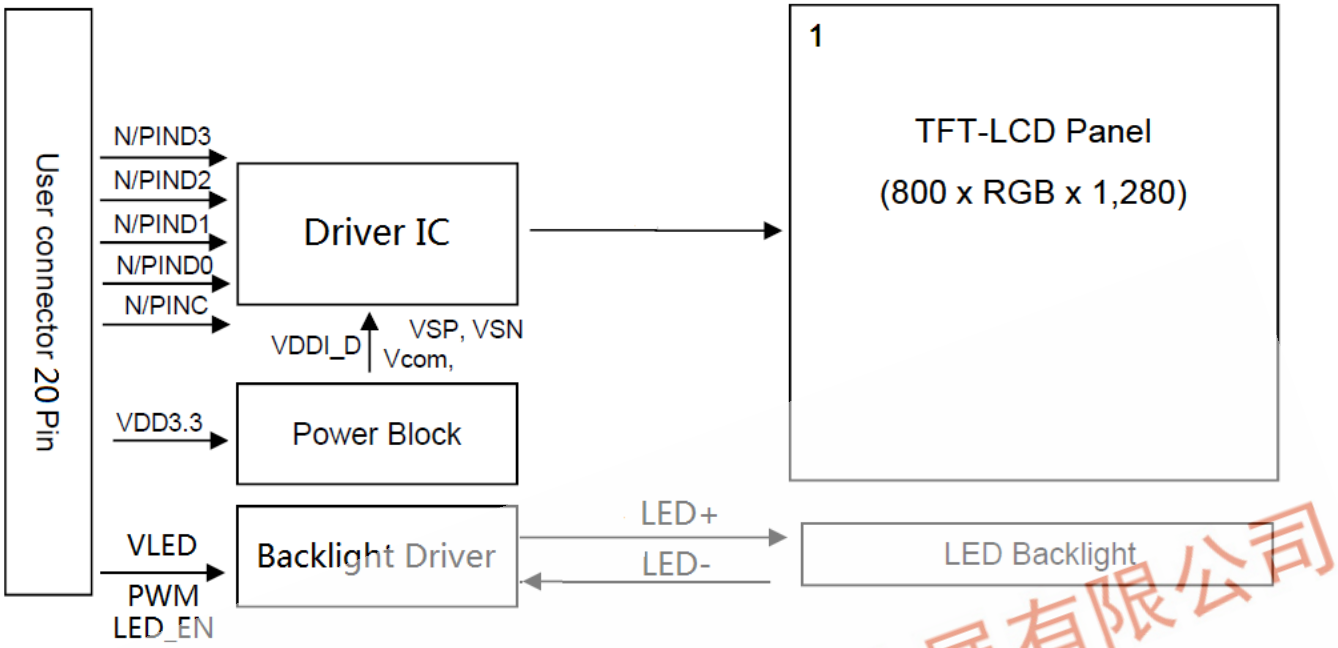
3.1 CN1 of FPC

Pin No.	Symbol	I/O	Function	Remark
1	VDDIN	P	Power supply VDDIN=3.3V	
2	VDDIN	P	Power supply VDDIN=3.3V	
3	LED_EN	I	Backlight Enable Signal,3.3V~5V.	
4	GND	P	Ground	
5	RXIN0N	I	-LVDS differential data	
6	RXIN0P	I	+LVDS differential data	
7	GND	P	Ground	
8	RXIN1N	I	-LVDS differential data	
9	RXIN1P	I	+LVDS differential data	
10	GND	P	Ground	
11	RXIN2-	I	-LVDS differential data	
12	RXIN2+	I	+LVDS differential data	
13	GND	P	Ground	
14	RX_CLKN	I	-LVDS differential clock input	
15	RX_CLKP	I	+LVDS differential clock input	
16	GND	P	Ground	
17	RXIN3-	I	-LVDS differential data	
18	RXIN3+	I	+LVDS differential data	
19	PWM	I	Backlight brightness:apply 0.7V to 1.4V DC voltage signal	
20	VLED	P	Power supply VLED=5~12V(Typ.)	

I/O definition:

I: input, O: output, P: Power, -:No Connection

4. BLOCK DIAGRAM



5. ELECTRICAL CHARACTERISTICS

5.1 ABSOLUTE MAXIMUM RATINGS (Note1)

AGND= GND=0V, Ta = 25 ℃

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power input	VDDIN	-0.3	6.5	V	
VSP voltage	VSP	-0.3	6.5	V	
VSN voltage	VSN	-6.5	0.3	V	
B/L circuit input voltage	VLED	5	12	V	

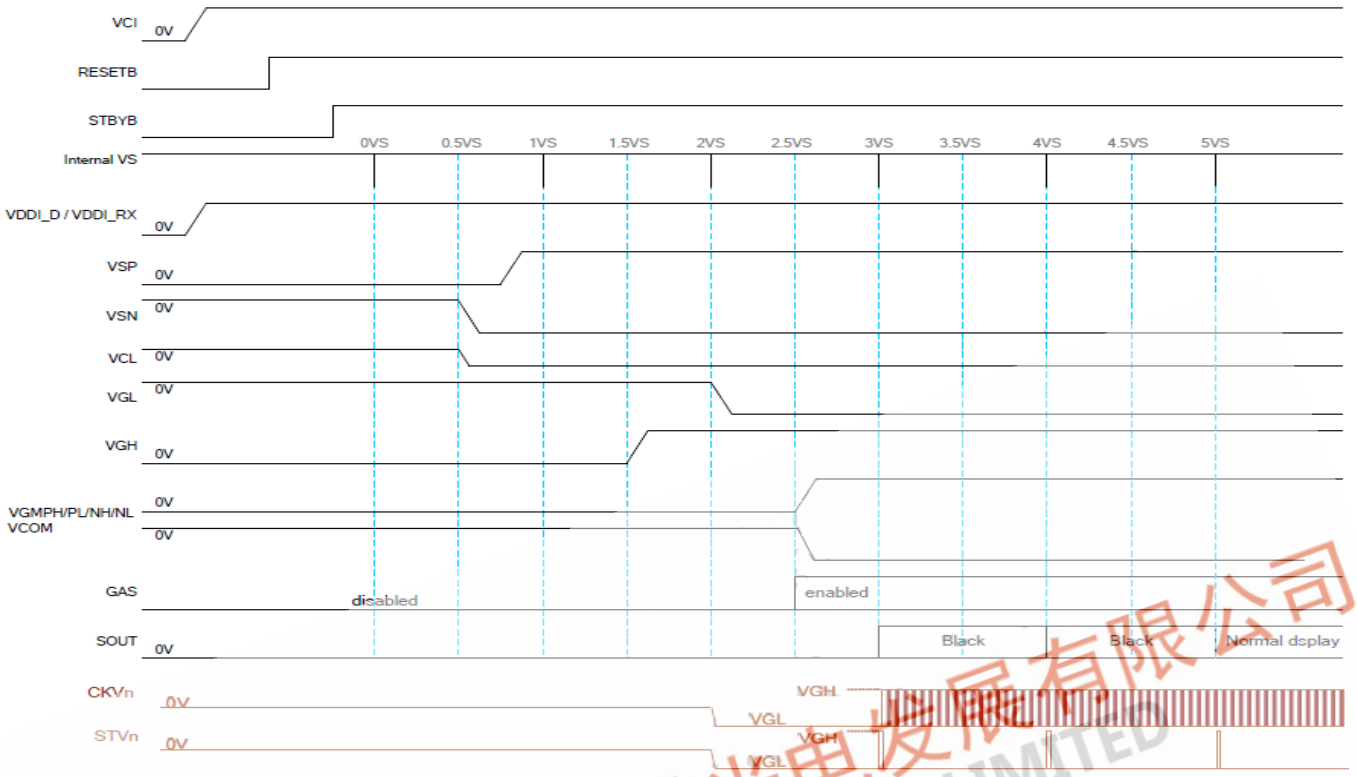
5.2 RECOMMENDED OPERATING CONDITION

AGND=GND=0V, Ta = 25℃

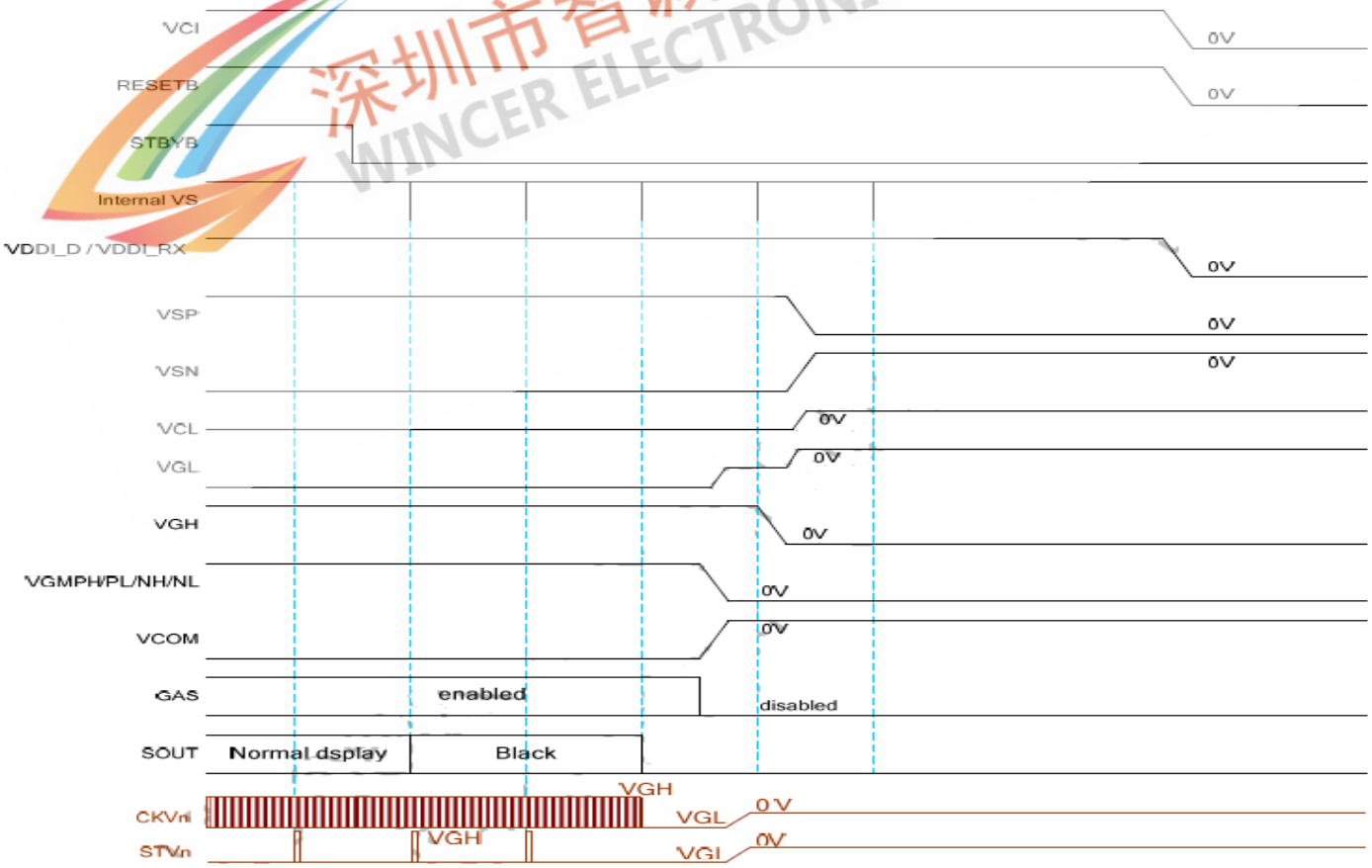
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power input	VDDIN	2.6	3.3	6	V	
VSP voltage	VSP	4.5	-	6	V	
VSN voltage	VSN	-6	-	-4.5	V	
B/L circuit input voltage	VLED		5~12		V	

5.3 POWER SEQUENCE

5.3.1 Power on sequence



5.3.2 Power off sequence

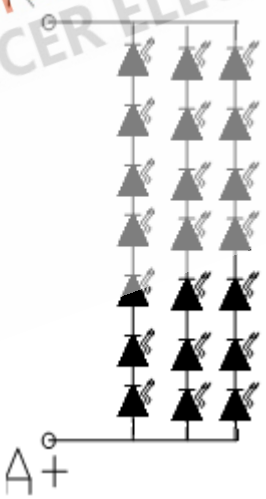


5.4 BACKLIGHT UNIT

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Forward voltage	VF	19.5	21	22.5	V	IF=20mA/1-chip
Forward current	IF	-	60	-	mA	
B/L circuit input voltage	VLED	5		12	V	
PWM Signal Voltage	PWM_h	2.0	3.3	3.6	V	-
PWM Signal Voltage	PWM_l	0	-	0.5	V	-
Output PWM frequency	PWM_f	-	200	1000	Hz	-
LED enable Voltage	EN_h	2.6	3.3	3.6	V	-
	EN_l	0	-	0.4	V	-

Note1:The LED supply Voltage is defined by the number of LED at Ta=25℃ and IL=60mA.
Note2:The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=60mA.The LED life time could be decreased if operating IL is larger than 60mA.

5.7.1 Internal Circuit Diagram

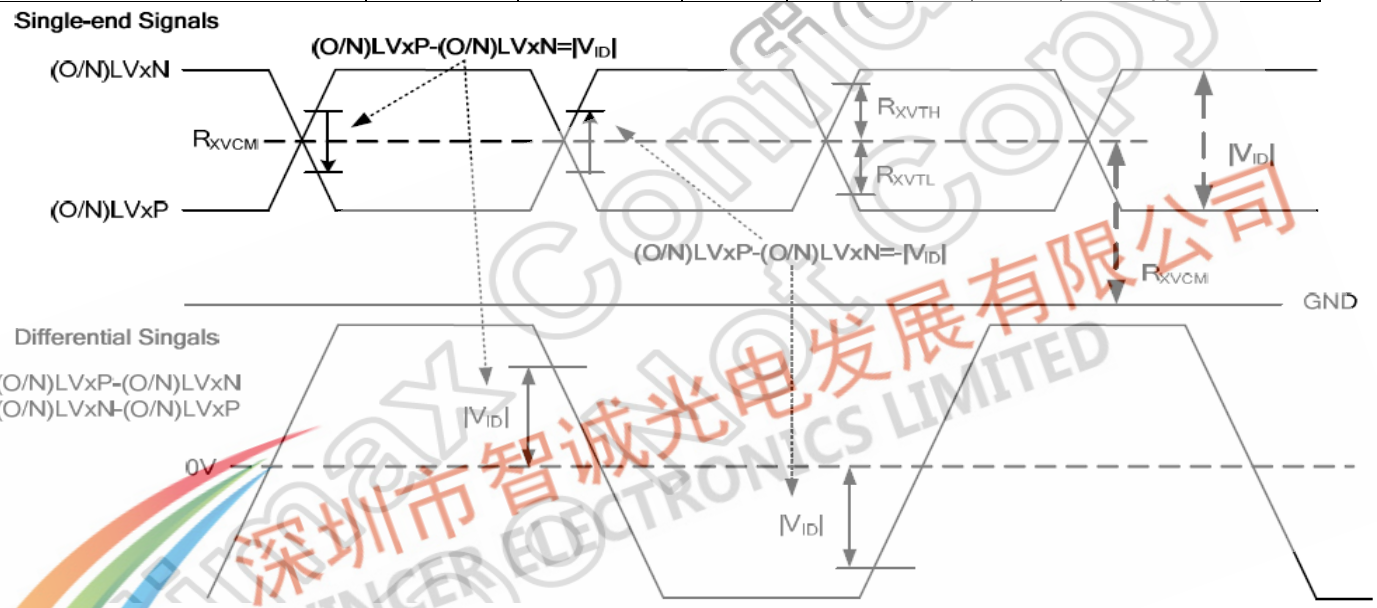


CURRENT IF=60mA

6. INPUT SIGNAL CHARACTERISTICS

6.1 LVDS mode DC electrical characterstics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold	R_{XVTH}	+0.1	-		V	R_{XVCM}=1.2V
Differential input low threshold voltage	R_{XVTL}	-	-	-0.1	V	-
Input voltage range(singled-end)	R_{XVIN}	0.7-|VID|/2	-	1.4+|VID|/2	V	-
Differential input common Mode voltage	R_{XVCM}	0.7	-	1.4	V	-
Differential input voltage	$\|V_{ID}\|$	0.2		0.6	V	-
Differential input leakage current	RVxliz	-10	-	+10	uA	-
LVDS digital operating current	Iddlvds	-	15	30	mA	Fclk=65MHz VDD=3.3V
LVDS digital stand-by current	Istlvds	-	10	50	uA	Clock & all Functions are stopped



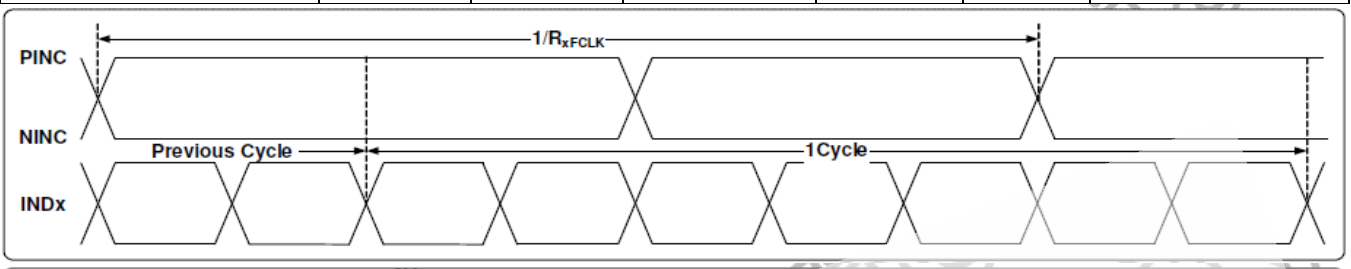
6.2 Input Timing table

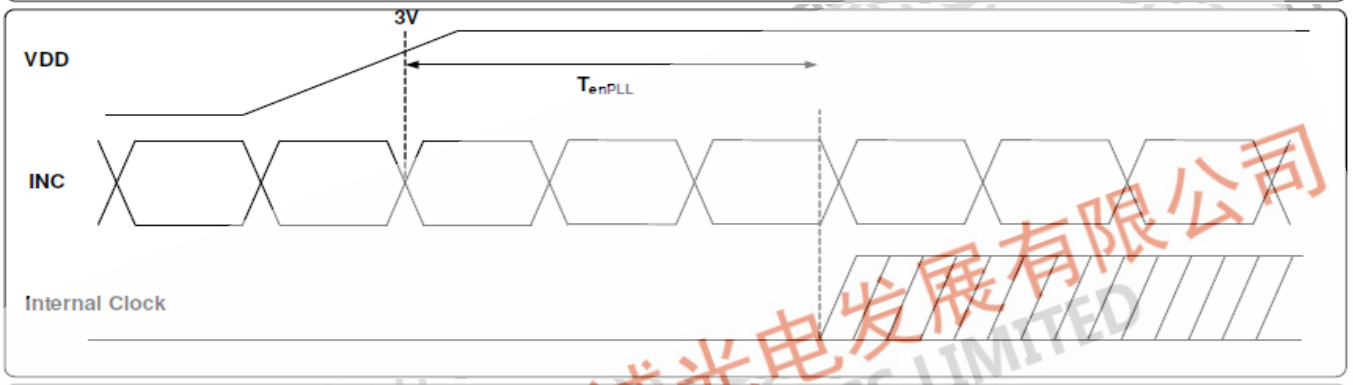
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
DCLK frequency@Frame rate=60Hz	F_{DCLK}	-	71.9	80	MHz	-
HSYNC period time	T_H	880	920	1600	DCLK	-
Horizontal display area	T_{HD}	-	800	-	DCLK	-
HSYNC pulse width	T_{HPW}	10	24	-	DCLK	-
HSYNC back porch	T_{HBP}	10	24	-	DCLK	-
HSYNC front porch	T_{FBP}	20	72	-	DCLK	Data to DCLK
VSYNC period time	T_V	1300	1304	2047	T_H	Data to DCLK
Vertical display area	T_{VD}	-	1280	-	T_H	-
VSYNC pulse width	T_{VPW}	1	2	-	T_H	-
VSYNC back porch	T_{VBP}	8	10	-	T_H	
VSYNC front porch	T_{VFP}	8	12	-	T_H	

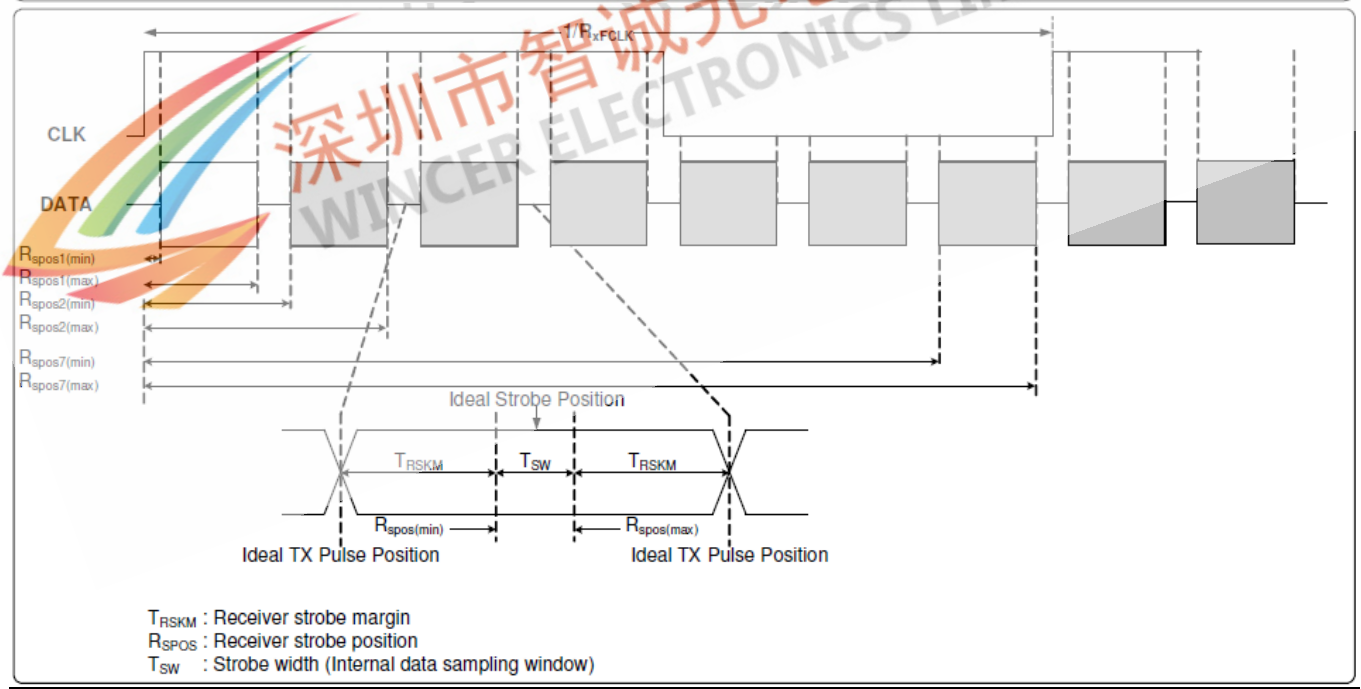
6.3 LVDS mode AC electrical characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition

Clock frequency	R_{XFCLK}	20	-	85	MHz	R_{XVCM}=1.2V
Input data skew margin	T_{RSKM}	500	-	-	ps	$\|V_{ID}\|$=400mV R_{XVCM}=1.2V R_{XFCLK}=71MHZ
Clock high time	T_{LVCH}	-	4/(7*R_{XFCLK})	-	ns	-
Clock low time	T_{LVCL}	-	3/(7*R_{XFCLK})	-	ns	-
PLL wake-up time	T_{RMPLL}	-	-	150	us	-







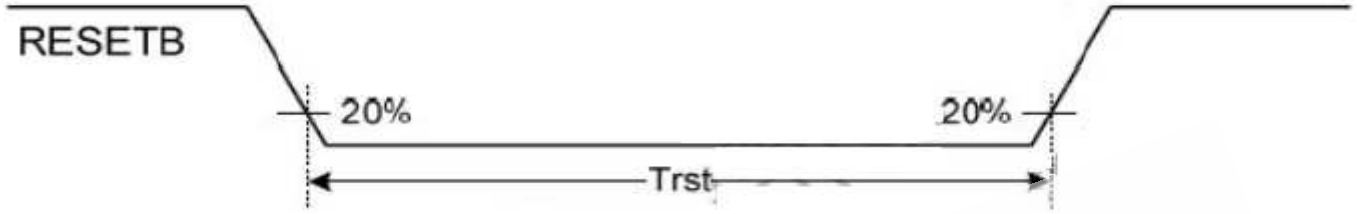
Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Modulation frequency	SSC_{MF}	23	-	93	KHz	R_{XVCM}=1.2V
Modulation rate	SSC_{MR}	-	-	±3	%	LVDS clock=71MHz center spread

6.4 Reset Timing Characteristics

When RESETB of reset pin equals to Low,it will be in the condition of reset.
When it is in the condition of reset,it will make the device recover the initial set.
However,in order to avoid the reset noise cause reset,there is a mechanism to judge

about whether the reset is needed or not.
The closed interval of Low can be shown as the following.
(VDDI_D=1.7V~1.9V,VSS=0V)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Reset low pulse width	Trst	-	20	-	-	us



7. OPTICAL CHARACTERISTICS

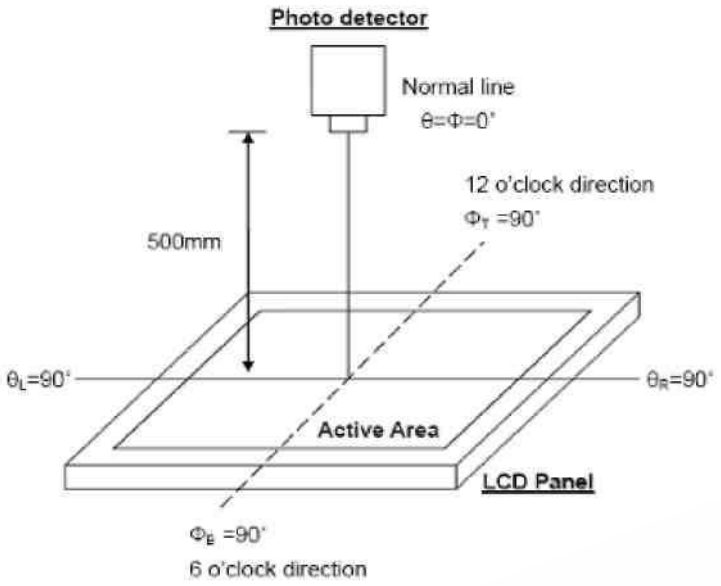
Light source :c-light(with normal polarizer)

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		

Viewing angle		Θ_u	CR≧10	80	85	-	degree	Note2
		Θ_D		80	85	-		
		Θ_L		80	85	-		
		Θ_R		80	85	-		
Response time		$T_{ON}+T_{OFF}$	θ=Φ =0° Normal viewing angle	-	25	50	ms	Note1 Note3
Contrast ratio		CR		600	800	-	-	Note1 Note4
Luminance		L		250	280	-	cd/m²	
Luminance uniformity		YU		75	-	-	%	
Color chromaticity (CIE1931)	White	W_X		0.271	0.301	0.331		Note1 Note5
		W_Y		0.296	0.326	0.356		
	Red	R_X		0.593	0.623	0.653		
		R_Y		0.329	0.359	0.389		
	Green	G_X		0.292	0.322	0.352		
		G_Y		0.555	0.585	0.615		
	Blue	B_X		0.108	0.138	0.168		
		B_Y		0.028	0.058	0.088		

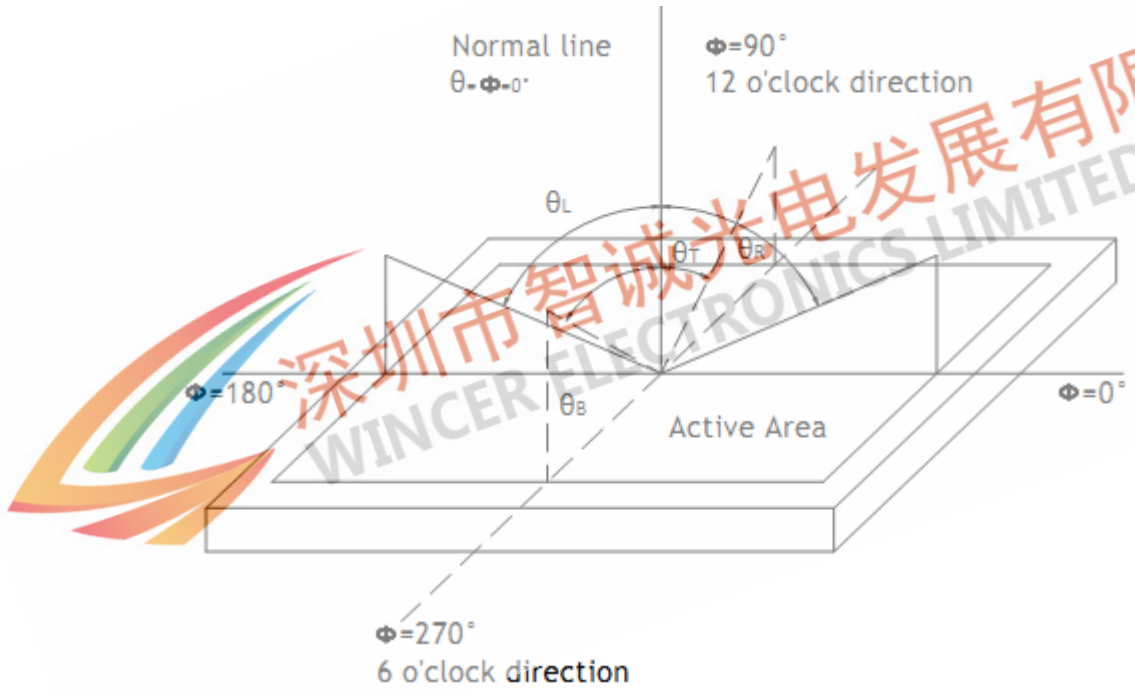
Test Conditions:
1.Measuring surrounding:dark room
2.The ambient temperature is 25±2°C.
3.The test systems refer to Note1 and Note2.

Note1: Definition of optical measurement system



Note2: Definition of viewing angle range and measurement system

Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).



Note3: 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%.

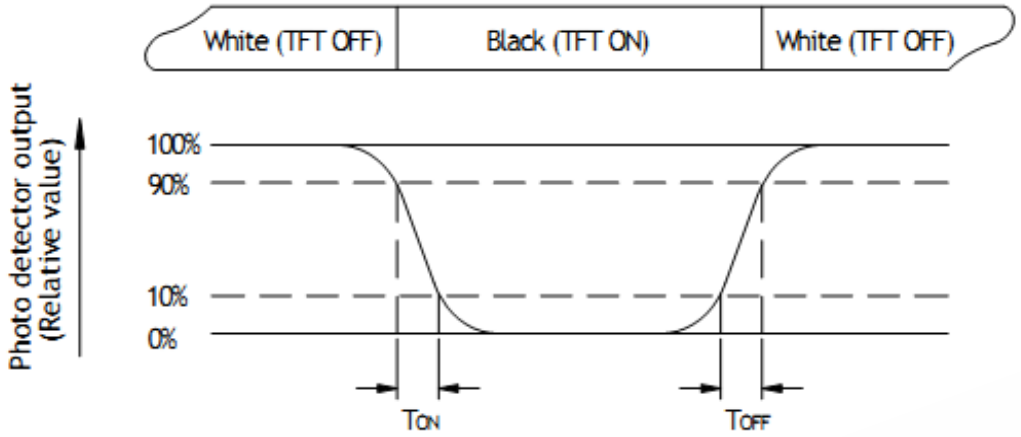


Fig. 6-3 Definition of response time

Note4: Definition of contrast ratio

$$\text{Contrast ratio(CR)} = \frac{\text{Luminance measured when LCD on the Whitestate}}{\text{Luminance measured when LCD on the Blackstate}}$$

"White state ": The state is that the LCD should drive by Vwhite.

"Black state": The state is that the LCD should drive by Vblack.

Vwhite: To be determined Vblack: To be determined.

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note6: All input terminals LCD panel must be ground while measuring the center area of the panel.

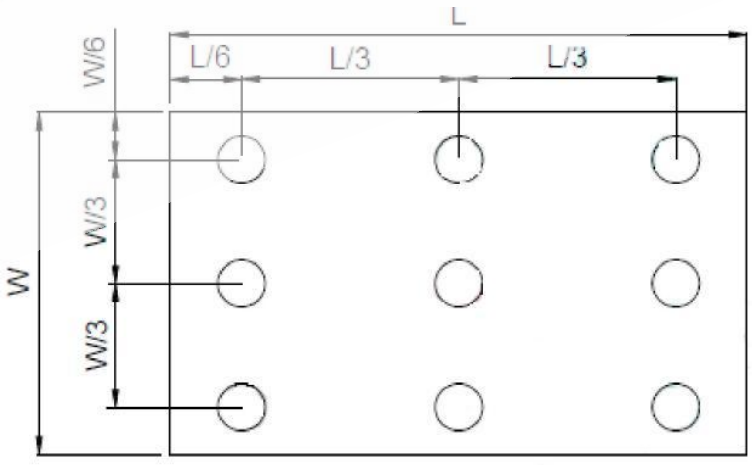
The LED driving condition is IL=20mA of which each LED module is 3 LED serial.

Note7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas.Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

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



Bmax: The measured maximum luminance of all measurement position.

Bmin: The measured minimum luminance of all measurement position.

Note8: Definition of Luminance

Measure the luminance of white state at center point.

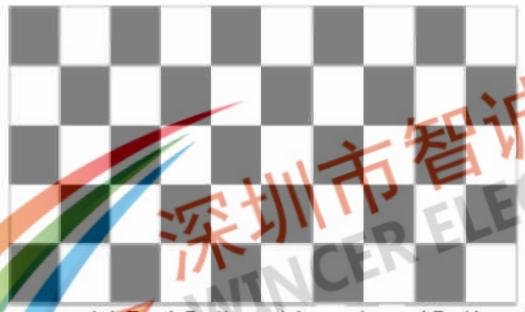
8. RELIABILITY TEST

8.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition
High Temperature Storage	Ta=60℃; 240hrs
Low Temperature Storage	Ta=-20℃; 240hrs
High Temperature Operation	Ta=50℃ ; 240hrs
Low Temperature Operation	Ta=0℃; 240hrs
High Temperature High Humidity Operation	Ta=60℃ ; 90%RH ; 240hrs(no condensation)
Thermal Shock	-20℃(0.5hrs) ~ 60℃(0.5hrs) / 100 cycles
Image Sticking	25℃ ; 2hrs Note1

Note1:Condition of image sticking test :25°C±2°C

Operation with test pattern sustained for 4hrs,then change to gray pattern immediately.after5 mins,the mura must be disappeared completely



(a) Test Pattern (chess board Pattern)

(b) Gray Pattern

8.2 VIBRATION & SHOCK

Test item	Conditions
Packing Shock (non-operation)	Shock level:980m/s^2 Waveform:1/2 Sine wave,6msec ±X, ±Y ±Z,each axis 1 times
Packing Vibration (non-operation)	Frequency range:8 HZ~33.3HZ Stroke:1.0mm,sweep:10 HZ ~50 HZ x,y,z 2 hours for each direction

8.3 ESD

Test item	Conditions
Electro Static Discharge Test (non-operation)	150pF,330Ω， Contact±4KV,Air :±8KV Note 1
	200pF,0Ω， ±200V Contact test.Note 2

Note1:LCD glass and metal bezel

Note2:IF connector pins

9. GENERAL PRECAUTION

9.1 SAFETY

(1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
(2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
(3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

9.2 STORAGE CONDITIONS

(1) Store the panel or module in a dark place where the temperature is 23±5°C and the humidity is below 50±20%RH.
(2) Store in anti-static electricity container.
(3) Store in clean environment, free from dust, active gas, and solvent.
(4) Do not place the module near organics solvents or corrosive gases.
(5) Do not crush, shake, or jolt the module.

9.3 HANDLING PRECAUTIONS

(1) Avoid static electricity which can damage the CMOS LSI.
(2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
(3) Do not give external shock.
(4) Do not apply excessive force on the surface.
(5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
(6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
(7) Do not operate it above the absolute maximum rating.
(8) Do not remove the panel or frame from the module.
(9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
(10) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining and discoloration may occur.
(11) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

9.4 WARRANTY

(1) The period is within twelve months since the date of shipping out under normal using and storage conditions.
(2) Do not repaired or modified the LCM . It may cause function to lose efficacy , Starry does not warrant the LCM.
(3) All process and material comply RoHS.

10. PACKAGE DRAWING

TBD