深圳市阿美林电子科技有限公司
Shenzhen Amelin Electronic Technology Co. ,Ltd

PRODUCT SPECIFICATION

MODEL: AML101WXBI40-02A

<◇>PRELIMINARY SPECIFICATION

<◆>APPROVAL SPECIFICATION

CUSTOMER
APPROVED BY
DATE:

DESIGNED	CHECKED	APPROVED

深圳市阿美林电子科技有限公司
Shenzhen Amelin Electronic Technology Co. ,Ltd

REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2017.09.20	-	First Issued.	linjie

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1. GENERAL DESCRIPTION

1.1 DESCRIPTION

AML101WXBI40-02A is a color active matrix thin film transistor (TFT) IPS liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, Driver IC , FPC and Backlight.

1.2 FEATURES:

No.	Item	Specification	Unit
1	Panel Size	10.1"	inch
2	Number of Pixels	800×RGB (3) ×1280	pixels
3	Active Area	135.36 (W)x 216.58 (H)	mm
4	Pixel Pitch	0.1692 (W)×0.1692(H)	mm
5	Outline Dimension	143 (W)×228.6 (H)×2.6(D)	mm
6	Number of Colors	16.7M	-
7	Display Mode	Normally Black	-
8	Viewing Direction	Whole View	-
9	Display Format	RGB vertical stripe	-
10	Center Luminance (cd/m^2)	280(TYP.)	nit
11	Contrast Ratio	900(TYP.)	
12	Surface Treatment	Anti-Glare	-
13	Interface	MIPI	-
14	Backlight	White LED	-
15	Operation Temperature	-10~50	℃
16	Storage Temperature	-15~55	℃
17	Polarizer Type	AG: Anti Glare (2H,3H)	
		HC: Hard Coating	

2. MECHANICAL SPECIFICATION

Specification:
1). Display mode: 16.7M TFT/Transmissive, Normally Black
2). Viewing angle: Full View
3). Operating temp.: -10°C~+50°C
   Storage temp.: -15°C~+55°C
4). Backlight: 28chip White LED , IH=80mA, VF=21V~23.8V
5). LCM brightness:250cd/m2(min), 280cd/m2(typ):
   LCM Chromaticity(White): X=0.325+/-0.05;Y=0.347+/-0.05.
6). General Tolerance:±0.20.
7). Rohs Compliancy.
8). with mark "O" are referenced
9). 泡棉开窗小于LCD外形0.5mm以上

7*4=28LED
VF=21V~23.8V,
20mA*4=80mA

10.1" IPS
800X1280

FPC弯折示意图
FPC弯折出货

黑色维修胶2118*1840.05
DM01000024042

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核准	产品型号	AML101WXBI40-02A
审查	产品描述	N/A
提供者	单位 mm	料号版本 V1
2017.12.11	尺寸公差 ±0.20mm	出图版本 V1
	比例 1:1	
	图纸尺寸 A4	页数 1 of 1

3rd ANGLE

PIN	DESCRIPTION
1	NC
2	VDD
3	VDD
4	GND
5	RESET
6	GND
7	NC
8	MIPI_0P
9	MIPI_0N
10	GND
11	MIPI_1P
12	MIPI_1N
13	GND
14	MIPI_CKN
15	MIPI_CKP
16	GND
17	MIPI_2P
18	MIPI_2N
19	GND
20	MIPI_3P
21	MIPI_3N
22	GND
23	NC
24	GND
25	NC
26	NC
27	NC
28	NC
29	NC
30	GND
31	LED-
32	NC
33	NC
34	NC
35	GND
36	NC
37	NC
38	NC
39	LED+
40	LED+

REV(修改)	DATE(日期)	DESCRIPTION(修改内容)
A0	2017.10.18	修改L-POL尺寸以及贴附公差
A1	2017.12.11	加大黑色维缘胶尺寸

REDACTOR(修订者)

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3. PIN DESCRIPTION

Pin No.	Symbol	Type	Function
1	NC	-	NC
2	VDD	P	Power supply 3.3V
3	VDD	P	Power supply 3.3V
4	GND	P	Ground
5	RESET	p	Global reset pin
6	NC	-	No connection
7	GND	P	Ground
8	MIPI-0N	I	MIPI Date negative signal
9	MIPI-0P	I	MIPI Date Positive signal
10	GND	P	Ground
11	MIPI-1N	I	MIPI Date negative signal
12	MIPI-1P	I	MIPI Date Positive signal
13	GND	P	Ground
14	MIPI-CLKN	I	MIPI CLK negative signal
15	MIPI-CLKP	I	MIPI CLK Positive signal
16	GND	P	Ground
17	MIPI-2N	I/O	MIPI Date negative signal
18	MIPI-2P	I/O	MIPI Date Positive signal
19	GND	P	Ground
20	MIPI-3N	I	MIPI Date negative signal
21	MIPI-3P	I	MIPI Date Positive signal
22	GND	P	Ground
23	NC	-	No connection
24	NC	-	No connection
25	GND	P	Ground
26	NC	-	No connection
27	NC	-	No connection
28	NC	-	No connection
29	NC	-	No connection
30	GND	P	Ground
31	LED-	P	Power for LED backlight (Cathode)
32	LED-	P	Power for LED backlight (Cathode)
33	NC	-	No connection
34	NC	-	No connection
35	NC	-	No connection
36	NC	-	No connection
37	NC	-	No connection
38	NC	-	No connection
39	LED+	P	Power for LED backlight (Anode)
40	LED+	P	Power for LED backlight (Anode)

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4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

4.1.1 LCD Module Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power Supply Voltage (LCD Module)	VDD	-0.3	3.3	4.2	V	
Logic Low Threshold (LED_EN,PWM)	VIL	-	-	0.8	V	
Logic High Threshold (LED_EN,PWM)	VIH	1.9	-	-	V	
PWM Dimming Frequency	fDIM	100	-	30K	Hz	

4.2 ELECTRICAL SPECIFICATIONS

4.2.1 LCD Module Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Digital Supply Voltage 1	VDDIO	1.65	1.8	3.3	V	
Voltage Current 1	Ivddio	100			mA	
Digital Supply Voltage 2	VDD	3.0	3.3	3.6	V	
Voltage Current 2	Ivdd	200			mA	

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM. The current draw and power consumption specified is for 3.3V at 25℃.
b) Typ. : Color Bar Pattern
a) Max. : White(L255) Pattern

4.4 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below
Power-On/Off Timing Sequence:
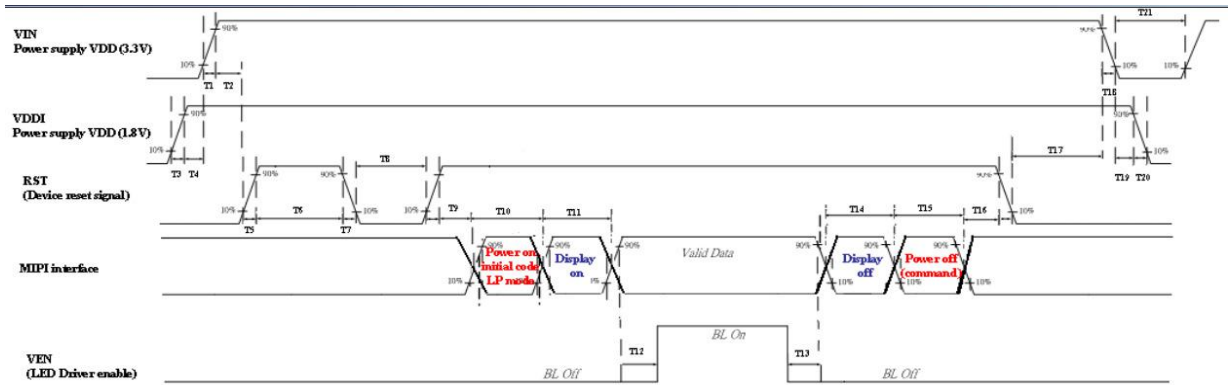
Power Sequence Timing			
Parameter	Value		Unit
	Min.	Max.	
T1	0.5	10	ms
T2	1	-	
T3	0.5	10	
T4	0	50	
T5	0	0.002	
T6	1	-	
T7	0	0.002	
T8	0.01	-	
T9	5	-	
T10	180	-	
T11	33.4	-	
T12	200	-	
T13	200	-	
T14	33.4	-	
T15	180	-	
T16	50	-	
T17	120	-	
T18	0	10	
T19	0	10	
T20	0	10	
T21	500	-	

4.5 BACK LIGHT UNIT

Ta=25℃

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	ILED		80		mA	28LEDS
Forward voltage	VF	21	22.4	23.8	V	IF=80mA 28LEDS
Reverse current	IR			50	μA	VR=10V,1LED
Luminous tolerance	IV-M	70	75		%	(Min/Max)×100
Power dissipation	Pd		1792		mW	28LEDS
Peak forward current	IFP		100		mA	1LED
Reverse Voltage	VR		10		V	1LED

4.5.1 Internal Circuit Diagram
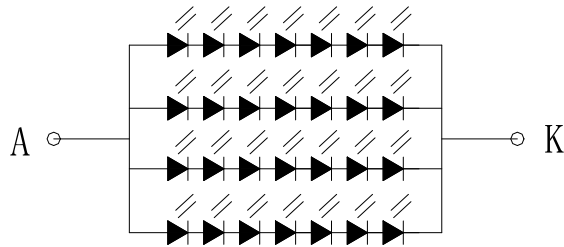
7*4=28LED, VF=21~23.8V, 20mA*4=80mA

5. INPUT SIGNAL TIMING

5.1 LCM INITIALIZATION CODE
TBD

5.2 PARALLEL MIPI INPUT TIMING TABLE
5.2.1 Porch data parameter

Vertical Total	VT	1300	Line
V-Front porch	VFP	12	Line
V-Back porch	VBP	12	Line
V-sync	VS	5	Line
V-active	VA	1280	Line
Horizontal Total	HT	960	Pixel
H-Front porch	HFP	50	Pixel
H-Back porch	HBP	40	Pixel
H-sync	HS	4	Pixel
H-active	HA	800	pixel

5.3 TIMING DIAGRAM

5.3 High speed mode timing

Parameter	Symbol	Parameter	Specification			Unit
			MIN	TYP	MAX	
High Speed Mode						
DSI-CLK+/-	$2xUI_{INST}$	Double UI instantaneous	2.22	-	25	ns
DSI-CLK+/-	UI_{INSTA} , UI_{INSTB}	UI instantaneous Halfs	1.11	-	12.5	ns
DSI-Dn+/-	t_{DS}	Data to clock setup time	0.15	-	-	UI
DSI-Dn+/-	t_{DH}	Data to clock hold time	0.15	-	-	UI
DSI-CLK+/-	t_{DRTCLK}	Differential rise time for clock	150	-	0.3UI	ps
DSI-Dn+/-	$t_{DRTDATA}$	Differential rise time for data	150	-	0.3UI	ps
DSI-CLK+/-	t_{DFTCLK}	Differential fall time for clock	150	-	0.3UI	ps
DSI-Dn+/-	$t_{DFTDATA}$	Differential fall time for data	150	-	0.3UI	ps
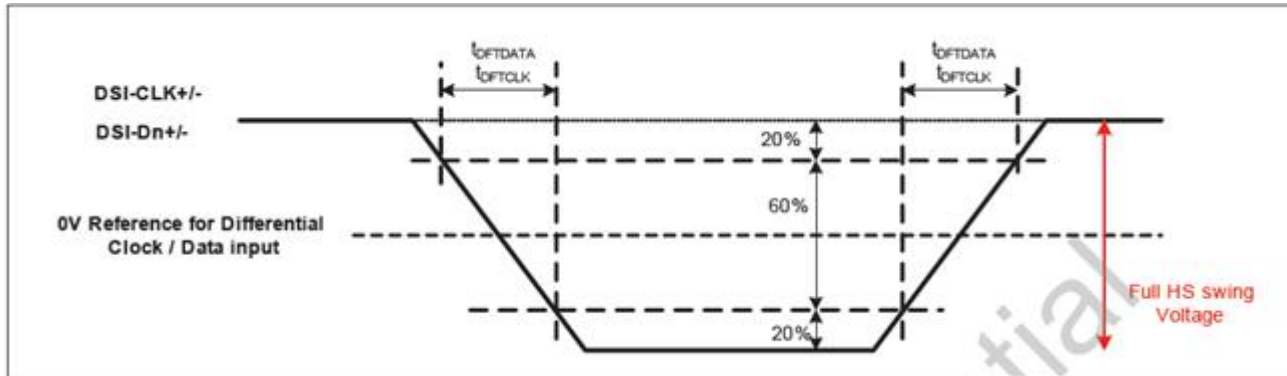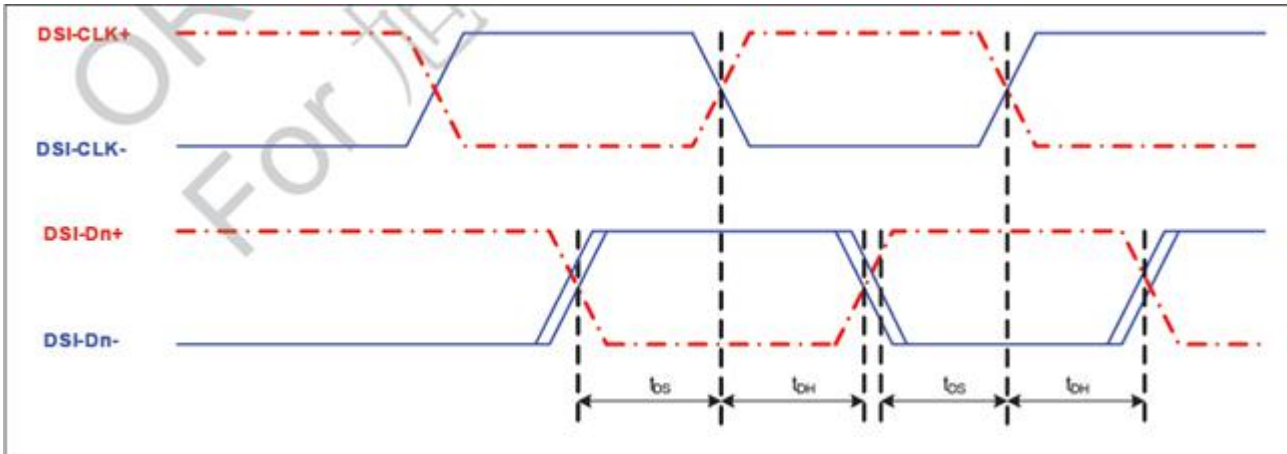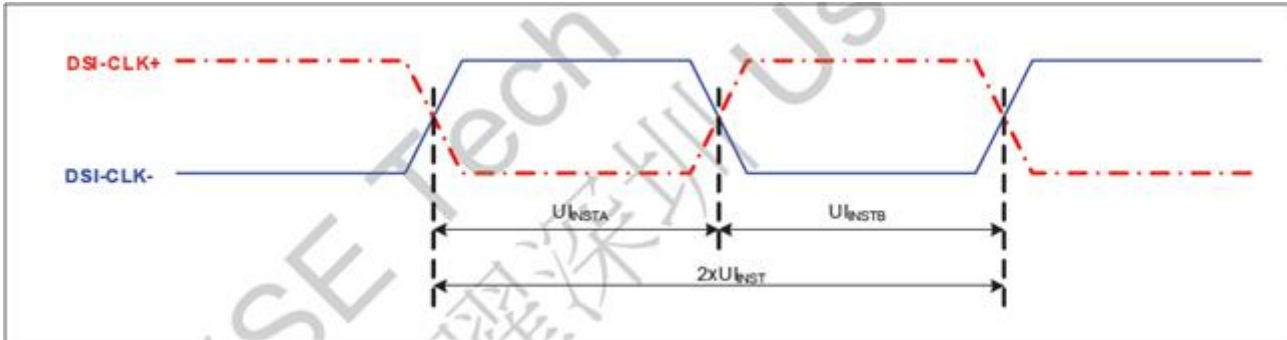
## 5.4 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

Color & Gray Scale		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△				↑								↑								↑				
	▽				↓								↓								↓				
	Brighter	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	▽	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	△				↑								↑								↑				
	▽				↓								↓								↓				
	Brighter	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	△				↑								↑								↑				
	▽				↓								↓								↓				
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Gray Scale of White	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
	△				↑								↑								↑				
	▽				↓								↓								↓				
	Brighter	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
	▽	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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6.Optical Characteristics

Ta=25℃±2

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	Θ = 0°	700	900	-		Note1 Note4
Center Luminance		YL		250	280	-	cd/m2	Note1 Note6 Note7
Luminance Uniformity		IV-M		70	75		%	
Response Time (Rising + Falling)		T$_{RT}$	Ta= 25℃ Θ = 0°	-	25	-	ms	Note1 Note3
Viewing Angle range	Horizontal	ΘL	CR > 10	-	80	-		Note2
		ΘR		-	80	-		
	Vertical	ΘU		-	80	-		
		ΘD		-	80	-		
Color Chromaticity	White	x		Typ -0.03	0.304	Typ +0.03		Note1 Note5 Note7
		y			0.333			
	Red	x			0.600			
		y			0.325			
	Green	x			0.282			
		y			0.536			
	Blue	x			0.143			
		y			0.151			
NTSC				-	50	-	%	

Note1: Definition of optical measurement system
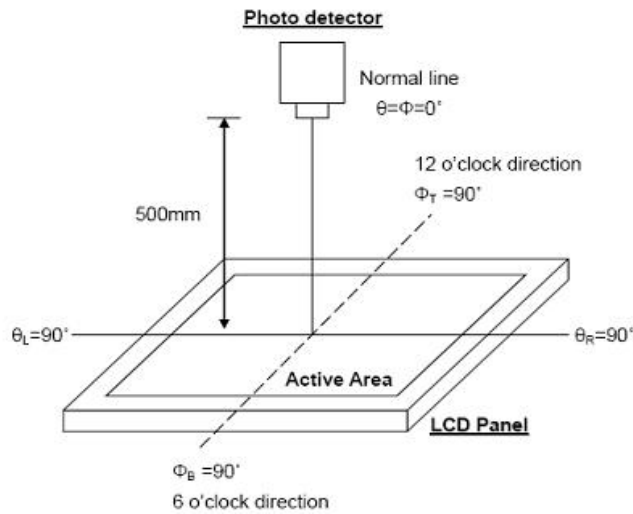
Note2: Definition of viewing angle range and measurement system
   Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).
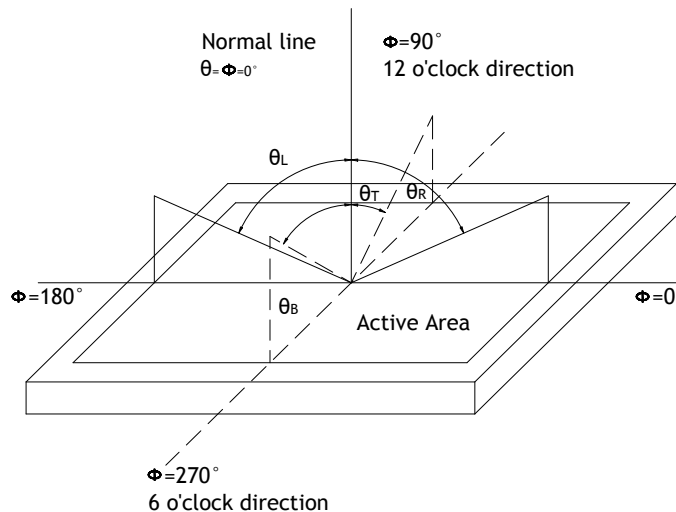
Note3: Definition of Response time
   The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.
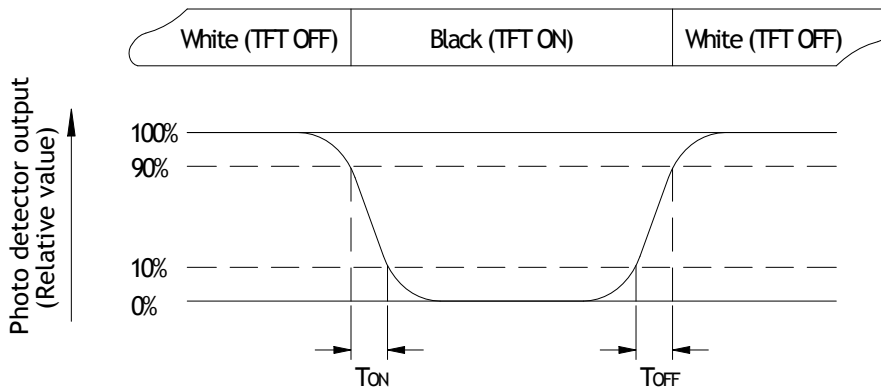
Fig. 6-3 Definition of response time

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=225mA.

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
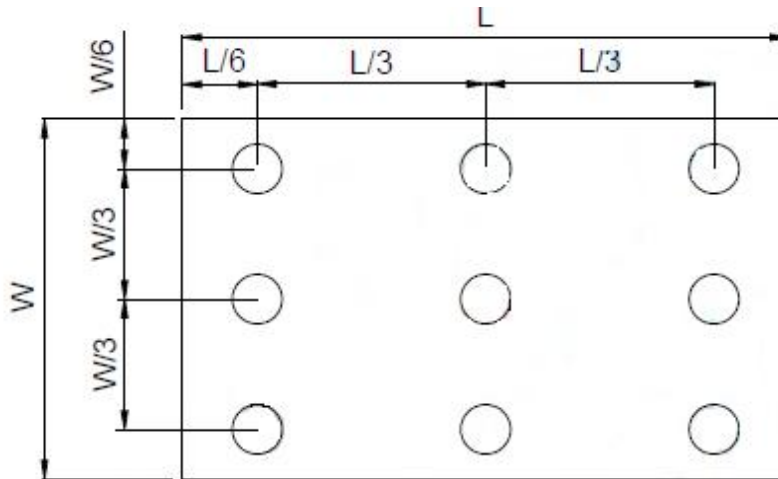
Bmax: The measured maximum luminance of all measurement position.

Bmin: The measured minimum luminance of all measurement position.

7. RELIABILITY TEST ITEMS

7.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition	Remark
High Temperature Storage	Ta=55℃; 72hrs	IEC60068-2-1：2007 GB2423.2-2008
Low Temperature Storage	Ta=-15℃; 72hrs	IEC60068-2-1：2007 GB2423.1-2008
High Temperature Operation	Ta=50℃，72Hrs	IEC60068-2-1：2007 GB2423.2-2008
Low Temperature Operation	Ta=-10℃; 72hrs	IEC60068-2-1：2007 GB2423.1-2008
High Temperature High Humidity Operation	Ta=50℃，90%RH，72Hrs(no condensation)	IEC60068-2-78：2001 GB/T2423.3-2006
Thermal Shock	-15℃(0.5h) ~ 55℃(0.5h) / 10cycles	Start with cold temperature，End with high temperature，IEC60068-2-14:1984,GB2423.22-2002
Image Sticking	25℃ ; 4hrs	Note1

Note1:Condition of image sticking test :25℃±2℃

Operation with test pattern sustained for 4hrs,then change to gray pattern immediately.after5 mins, the mura must be disappeared completely
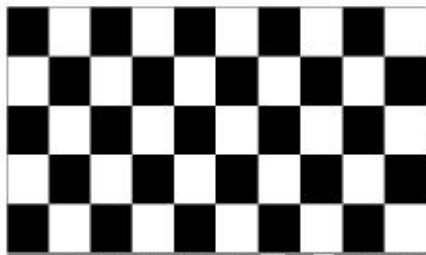
(a) Test Pattern (chess board Pattern)   (b) Gray Pattern

7.2 VIBRATION & SHOCK

Test item	Conditions	Remark
Packing Shock (non-operation)	980m/s2,6ms, ±x,y,z 3times for direction	IEC60068-2-27：1987 GB/T2423.5-1995
Packing Vibration (non-operation)	Frequency range:10 HZ~50HZ Stroke:1.0mm,sweep:10 HZ ~50HZ x,y,z 2 hours for each direction	IEC60068-2-32：1990 GB/T2423.8-1995

7.3 ESD

Test item	Conditions		Remark
Electro Static Discharge Test (non-operation)	150pF，330Ω，Contact:±4KV,Air:±8KV	1	IEC61000-4-2：2001 GB/T17626.2-2006
	200pF，0Ω，±200V contact test	2	

Note: Measure point :
1. LCD glass and metal bezel
2. IF connector pins

8. GENERAL PRECAUTION

8.1 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.

8.2 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.

8.3 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 theeyes or mouth In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

8.4 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, AMELIN does not warrant the LCM.
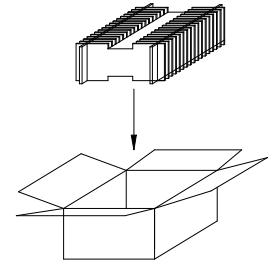(3) All process and material comply ROHS.
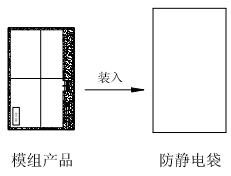
9. PACKAGE DRAWING

珍珠棉

包装箱（外纸箱）

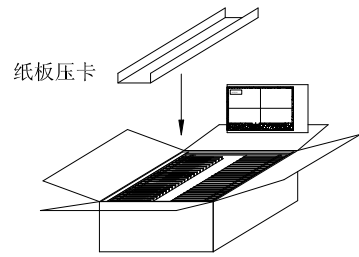第一步：
1、将珍珠棉垫于空纸箱下面
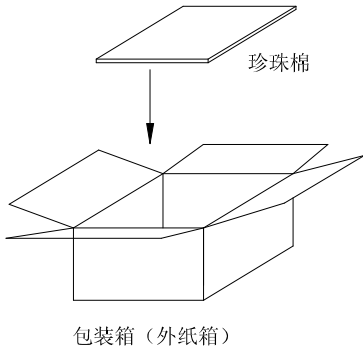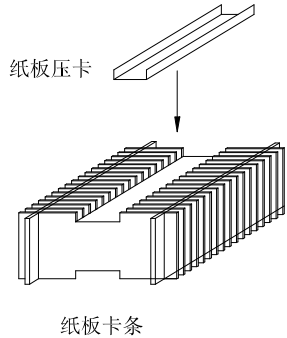
纸板压卡

纸板卡条

第二步：
1、将纸板压卡垫于纸板卡条的下卡槽

第三步：
1、将纸板卡条放入纸箱中

模组产品   装入   防静电袋
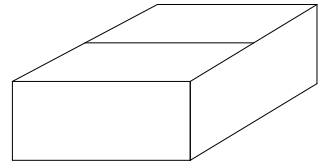
第四步：
1、将模组产品装入防静电袋中

纸板压卡

第五步：
1、将2pcs模组产品玻璃面紧靠放入纸板卡槽中，
2、将纸板压卡装入纸板卡条的上卡槽

第六步：
1、用透明胶封箱

10. The foreign standards

10.1. Appearance Inspection

(1) visual range: 35cm - 40cm

(2) visual Angle: normal visual LCD panel view (figure 1)

(3) temperature: 23 + / - 5 ℃

(4) ambient humidity: 60, plus or minus 5 RH

(5) ambient illumination: under the optical test 50 Lux, test 300 Lux below, the appearance 1000 Lux above, operate 500 Lux above

(6) the test conditions refer to the specification

(7) Mura &leakage USES ND - 5%

(8)The standards are not implemented according to the explicit standards
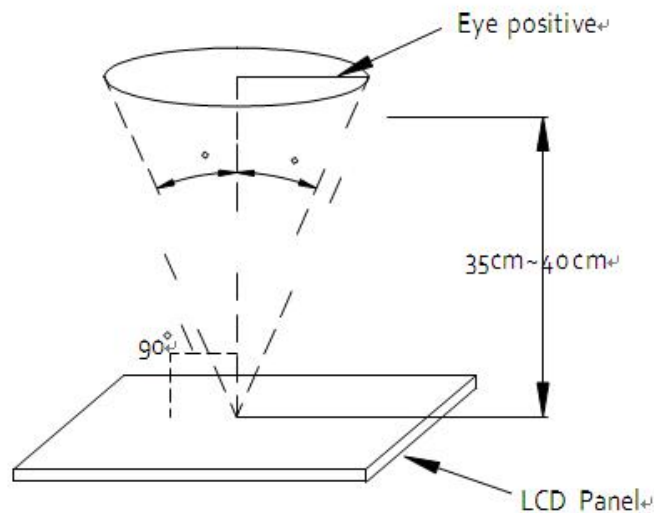
figure 1

10.2. Special survey

(1) visual distance: check the distance between the adjacent points and the defect points

(2) view change check

(3) special inspection: image residue test
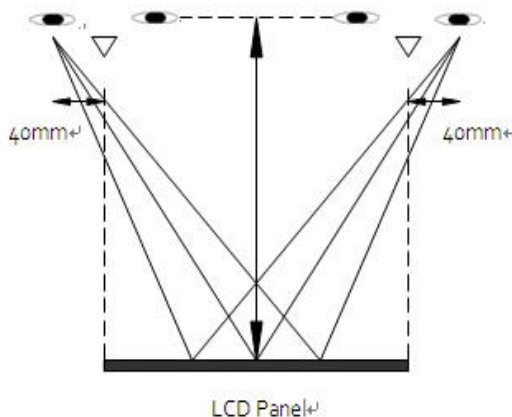
10.3. Inspection standard

Defect types			specifications				note
Visual impairment	The scratch		W≦0.05mm			ignore	note 1
			0.05mm≦w≦0.1mm L≦10mm			N≦3	
			10mm＜l, 0.1mm＜w			N=0	
	internal	point	Φ＜0.15mm			ignore	note 1
			0.15mm≦Φ≦0.35mm			N≦3	
			0.35mm＜Φ			N=0	
		Linear foreign	0.1mm ≦W≦0.2mm, l≦5mm			N≦4	note
			0.2mm＜w, 2.5mm＜l			N=0	
		POL convex-concave point	Φ＜0.15mm			ignore	note 1
			0.15mm≦Φ≦0.35mm			N≦2	
			0.35mm＜Φ			N=0	
Electrical defect	specifications		A 区	B 区		Total	note 2
	LCD dot		Φ ＜ 0.15mm	0.15mm＜d≤0.35mm		N≦2	
	BL dot		Φ ＜ 0.15mm	0.15mm＜d≤0.35mm		N≦2	
	Total points		N	N≦2		N≦2	note 3
	Two or more adjacent points		Don't allow				
(1) 1 pixel is 3 subpixels, including R, G, and B (2) the distance between two points is greater than 10cm							

note 1：W：breadth [mm], L：length [mm], N：numberΦ: diameter

$Φ=(a+b)/2$
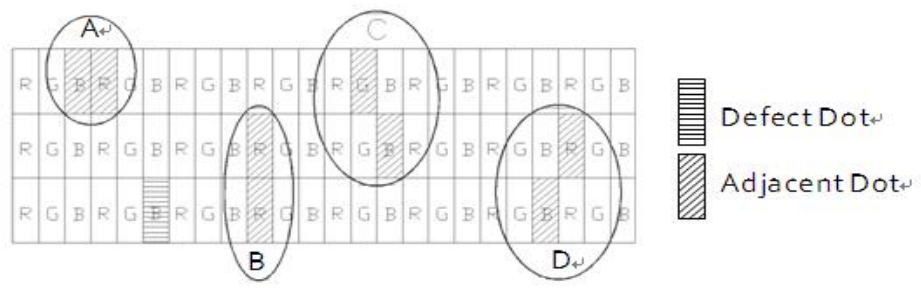1.(White ,Black) Spot
2.Polarizer Bubble

Scratch & Fiber
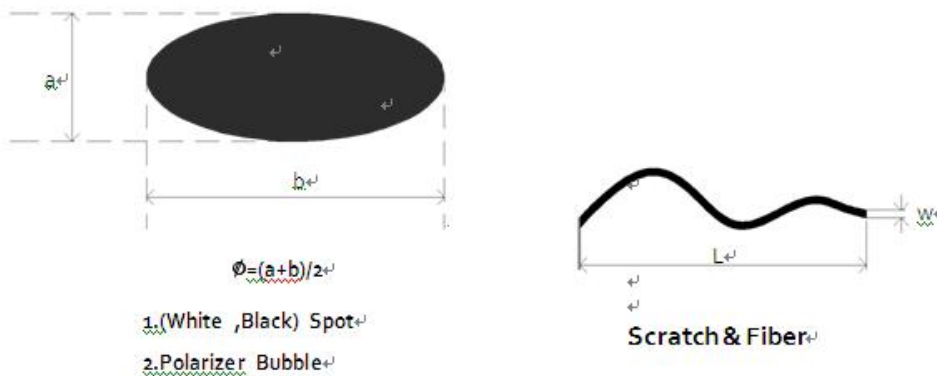
Note2：Highlights: according to panel vendor specification
Note3:areainthemiddle,andotherBareas
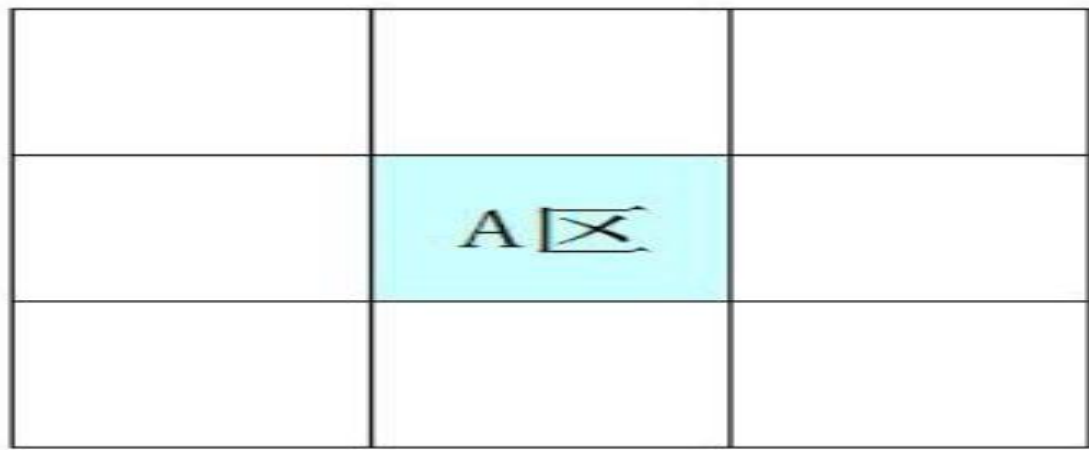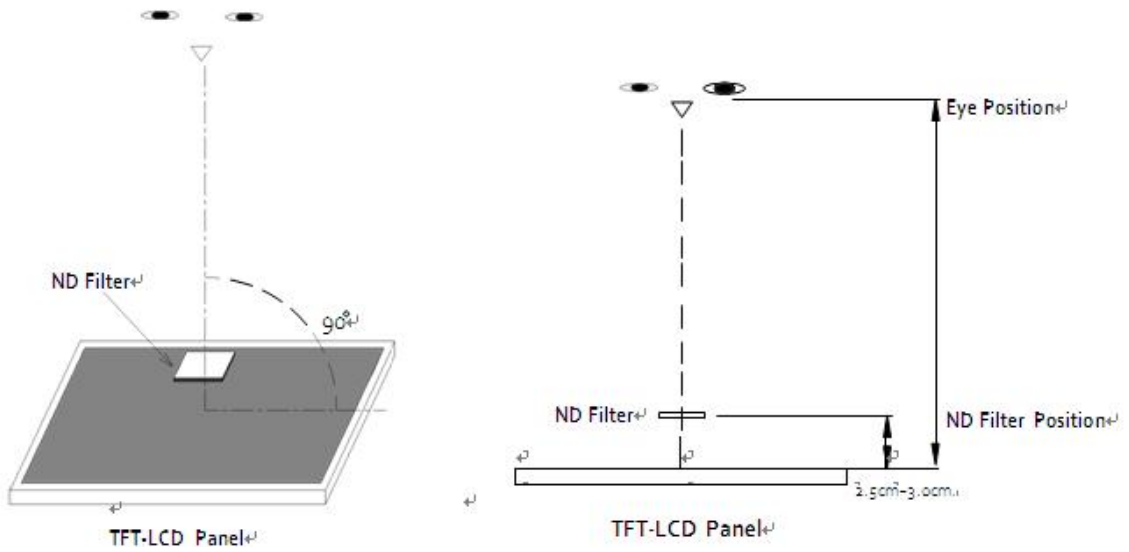
Note 4: the defect points and adjacent points are as follows

Adjacent defect points, including bright and adjacent points.They're going to count the total number of points of defect.

Note 5: other conditions

(1) the lack of line mentioned above shall be handled by both parties

(2) the missing line is not a defect or count under the black interface

10.4. Treatment measures

(1) Don't disassemble and reassemble the module by self.

(2) Acid, alkali, alcohol or touched directly by hand will damage the display.

(3) Static electricity will damage the module. Please configure grounding device.

(4)The strong vibration, shock, twist or bend will cause material damage, even module broken.

(5) It is easy to cause image sticking while displaying the same pattern for very long time.

(6) The response time, brightness and performance will vary from different temperature.

(7)12 months of the product term, Xianchuang shipment date began to count.