Reshine Display (HK) Technology Co., Limited

SPECIFICATION FOR TFT LCD MODULE

MODEL NO:	RXL040026-A
CUSTOMER:	**STD.**
CUSTOMER P/N.	
VERSION	**V1.1**
CUSTOMER APPROVED	

□ **Preliminary Specification**

■ **Final Specification**

PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT

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REVISION RECORD

Date	Rev.No.	Page	Revision Items	Prepared
2018.011.17	**V1.0**		**The first release**	Tom

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1.NOTICE

1.1 announce

1.1.1 These specification sheets are the proprietary product of Reshine DISPLAY and include materials protected under copyright of Reshine DISPLAY. Do not reproduce or cause any third party to reproduce them in any form or by any means, electronic or mechanical, for any purpose,in whole or in part,without theexpress written permission of Reshine DISPLAY . Reshine DISPLAY assumes no responsibility for any problems related to any industrial property right of a third party resulting from the use of the device.

1.1.2 Do not use the device for equipment that requires an extreme level of reliability, such as aerospace applications, nuclear power control equipment and medical or other equipment for life support..Reshine DISPLAY assumes no responsibility for any damage resulting from the use of the device whichdoes not comply with the instructions and the precautions specified in these specification sheets.

1.1.3 Contact and consult. with a Reshine DISPLAY sales representative for any questions about this device.

1.2 For handling and system design

1.2.1 Do not scratch the surface of the polarizer film as it is easily damaged.

1.2.2 If the cleaning of the surface of the LCD panel is necessary, wipe it swiftly with cotton or other soft cloth. Do not use organic solvent as it damages polarizer.

1.2.3 Water droplets on polarizer must be wiped off immediatelyas they may cause color changes, or other defects if remained for a long time.

1.2.4 Since this LCD panel is made of glass, dropping the module or banging it against hard objects may cause cracks or fragmentation.

1.2.5 Certain materials such as epoxy resin (amine's hardener)or silicone adhesive agent(de-alcohol or de-oxym) emits gas to which polarizer reacts(color change).Check carefully that gas from materials used in system housing or packing do not hart polarizer.

1.2.6 Liquid crystal material will freeze below specified storage temperature range and it will not get back to normal quality even after temperature comes back within specified temperature range.Liquid crystal material will become isotropic above specified temperature range and may not get back to normal quality. Keep the LCD module always within specified temperature range.

1.2.7 Do not expose LCD module to the direct sunlight, or to strong ultraviolet light for long time.If the LCD driver IC is exposed to light, normal operation may be impeded. It is necessary
to design so that the light is shut off when the LCD module is mounted.

1.2 Do not disassemble the LCD module as it may cause permanent damage. Hold LCD very carefully when placing LCD module into the system housing. Do not apply excessive stress or pressure to LCD module.

1.2.9 As this LCD module contains components sensitive to electrostatic discharge, be sure to follow the instructions in below.

①Operators

Operators must wear anti-static wears to prevent electrostatic charge up to and discharge from human body.

②Equipment and containers

Process equipment such as conveyer, soldering iron, working bench and containers may possibly generate electrostatic charge up and discharge.Equipment must begrounded through 100Mohms resistance. Use ion blower.

③Floor

Floor is an important part to leak static electricity which is generated from human body or equipment. There is a possibility that the static electricity is charged to them without leakage .in case of insulating floor, so the countermeasure(electrostatic earth:1×108Ω) should be made.

④Humidity

Proper umidityof working roommay reduce the isk ofelectrostatic charge up and discharge. Humidity should be kept over 50% all the time.

⑤Transportation/storage

Storage materials must be anti-static to prevent causing electrostatic discharge.

⑥Others

Protective film is attached on the surface of LCD panel to prevent scratches or other damage.When removing this protective film, remove it slowly under proper anti-ESD control such as ion blower.

1.2.10 Do not hold or touch LCD panel to flex interconnection area as it may be damaged.As the binding material between LCD panel and flex connector mentioned in flex area contains an organic material, any type of organic solvents are not allowed to be used. Direct contact by fingers are also prohibited.

1.2.11 When carrying the LCD module, place it on the tray to protect from mechanical damage.

It is recommended to use the conductive trays to protect the CMOS components from electrostatic discharge. When holding the module, hold the Plastic Frame of LCD module so that the panel ,TCP and other electric parts are not damaged. e.g. chart1

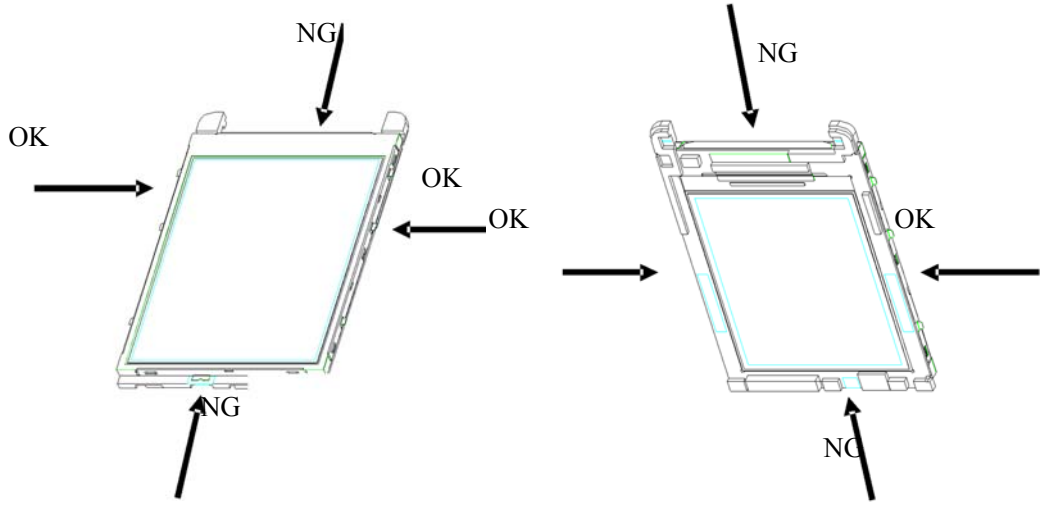


chart1 Note : The LCD module illustration is general module image

1.2.12 Do not touch the FPC ‘s exposed base film and patterning area, slit part. Otherwise the circuit maybe damaged. Do not touch LSI chips as it may cause a trouble in the inner lead connection.

1.2.13 Place a protective cover on the LCD module to protect the glass panel from mechanical damages.

1.2.14 LCD panel is susceptible to mechanical stress and even the slightest stress will cause a color change in background.So make sure the LCD panel is placed on flat plane without any continuous twisting, bending or pushing stress.

1.2.15 Protective film is placed onto the surface of LCD panel when it is shipped from factory. Make sure to peel it off before assembling the LCD module into the system. Be very careful not to damage LCD module by electrostatic discharge when peeling off this protective film. Ion blower and ground strap are recommended.

1.2.16 Make sure the mechanical design of the system in which the LCD module will be assembled matches specified viewing angle of this LCD module.

1.3 For operating LCD module

1.3.1 Do not operate or store the LCD module under outside of specified environmental conditions.

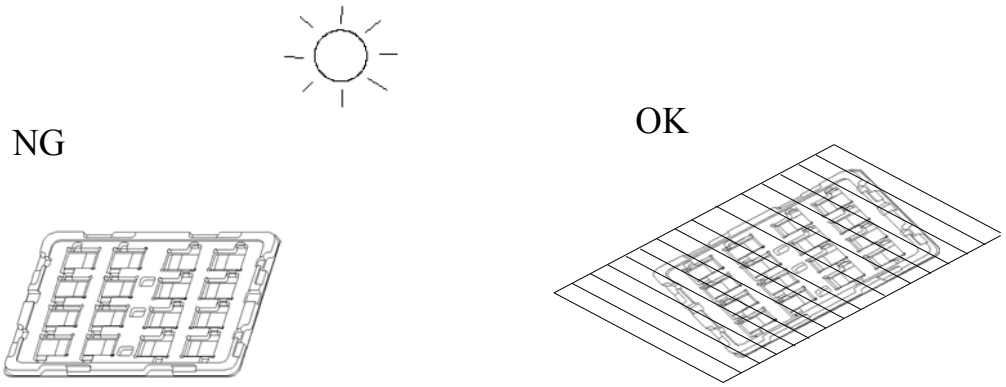
1.3.2 As opto-electrical characteristics of LCD will be changed, dependent on the temperature, the confirmation of display quality and characteristics has to be done after temperature is set at 25 °C and it becomes stable.

1.4 Precautions for Storage

1.4.1 Do not expose the LCD module to direct sunlight or strong ultraviolet light for long periods. Store in a dark place.

1.4.2 The liquid crystal material will solidify if stored below the rated storage temperature and will becomean isotropic liquid if stored above the rated storage temperature, and may not retain its original properties. Only store the module at normal temperature and humidity（25±5℃、60±10％ RH）in order to avoid exposing the front polarizer to chronic humidity.

1.4.3 Keeping method



a.Don't keeping under the direct sunlight. b.Keeping in the tray under the dark place

1.5 Other Notice

1.5.1 Generally, At power on, in order not to apply DC charge directly to LCD panel, supply logic voltage first and initialize LSI logic function including polarity alternation. Then supply voltage for LCD bias. At power off, in order not to apply DC charge directly to LCD panel, execute Power OFF sequence and Discharge command.

1.5.2 Don’t touch to PWB surface, exposed IC chip, electric parts and other parts, to any electric, metallic materials.

1.5.3 No bromide specific fire-retardant material is used in this module.

1.5.4 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.

2.General Specifications

RXL040026-A is a color active matrix LCD module incorporating amorphous silicon TFT (Thin Film Transistor). It is composed of a color TFT-LCD panel, driver IC, FPC and a back light unit. The display area contains 480 x 800 pixels and can display up to 16.7M colors. This product accords with RoHS environmental criterion.

Item	Contents			Unit	Note
LCD Type	TFT			-	
Display Color	262K/16.7M				1
LCD Duty	1/480			-	
Viewing Direction	ALL			O'Clock	
Active Area(W×H)	51.84x86.40			mm	
Number of Dots	480×(RGB)×800			mm	
Dot Pitch(W×H)	0.108X0.108			mm	
Controller	ILI9806E/CTP:GT5663			-	
V_{DD}	2.8V-3.3V			V	
V_{DDIO}	1.8V-3.3V			V	
Outline Dimensions	Refer to outline drawing on next page				
Backlight	8-LEDs(white)			-	
Weight	--			g	
Interface	24bits RGB (LCD)			-	
Polarizer Mode	Transmissive/Positive			-	

Note 1: Color tune is slightly changed by temperature and driving voltage.
Note 2: Requirements on Environmental Protection:RoHS
Note 3: Customer should do assembly according to our FPC bending sketch in the outline drawing.
Note 4: Please approve our spec before placing mass production order. Otherwise we will regard customer has approved the spec when we receive the first 2Kpcs or above order from customer.

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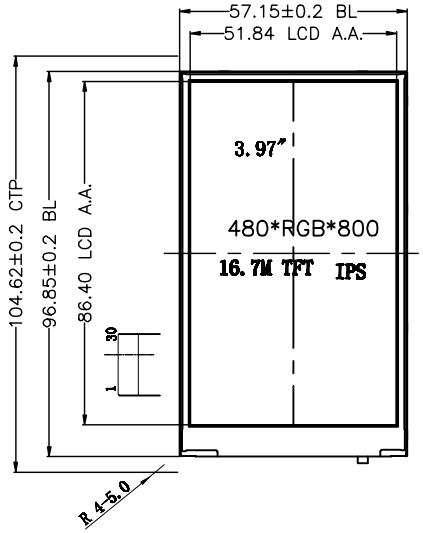
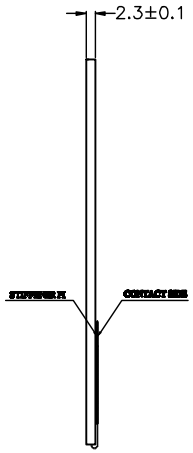
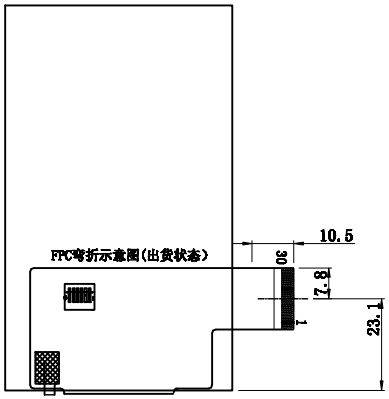
ISSUE	AMENDMENT	DATE
1	First Version	19.01.22

LCD:2 Data Lanes MIPI
CTP: GT911 IIC

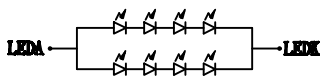
1	GND
2	D0−
3	D0+
4	GND
5	D1−
6	D1+
7	GND
8	CLK−
9	CLK+
10	GND
11	/RST
12	TE
13	GND
14	VCI
15	VCI
16	GND
17	IOVCC
18	IOVCC
19	GND
20	CTP_VDD
21	CTP_SDA
22	CTP_SCL
23	CTP_INT
24	CTP_RST
25	GND
26	LED+
27	LED+
28	LED−
29	LED−
30	GND



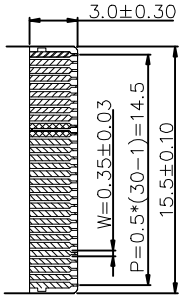




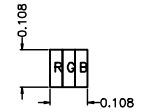
LED CIRCUIT DIAGRAM:



~12 V@ 40mA



DETAIL A(4:1)



(DOTS SIZE FOR CUSTOMER REFERENCE ONLY)

DISPLAY TYPE	TFT, TRANSMISSIVE
DISPLAY RESOLUTION	480 X RGB X 800
VIEWING ANGLE	ALL
LOGIC VOLTAGE/ANALOGIC	~3.2V
LCD CONTROLLER/DRIVER	ILI9806
SURFACE LUMINANCE(cd/m²)	250 (Typ.)
OPERATING TEMPERATURE	-20°C TO +70°C
STORAGE TEMPERATURE	-30°C TO +80°C
BACKLIGHT	TYPE: LED05:8pcs LED; COLOR: White; DRIVING VOLTAGE: ~12 V@ 40mA

NOTES:
1 ◇ : SPECIAL CHARACTERISTIC
2. + : SAFETY CHARACTERISTIC
3. ▽ : CRITICAL DIMENSION
4. (..) : REFERENCE DIMENSION

SCALE: 1 : 1 NOT TO SCALE	
PAGE: 1 OF 1	
GENERAL TOL. 0.50mm	UNITS MM
APPROVALS	DATE
APP:	
CHK:	
DWN: YANH	2019-01-22

Reshine Display (HK) Technology Co.,Limited
电话:0755-29190292 传真:0755-29190291

MODEL NUMBER :
RXL040026-A

CUSTOMER NO.:
DATE:

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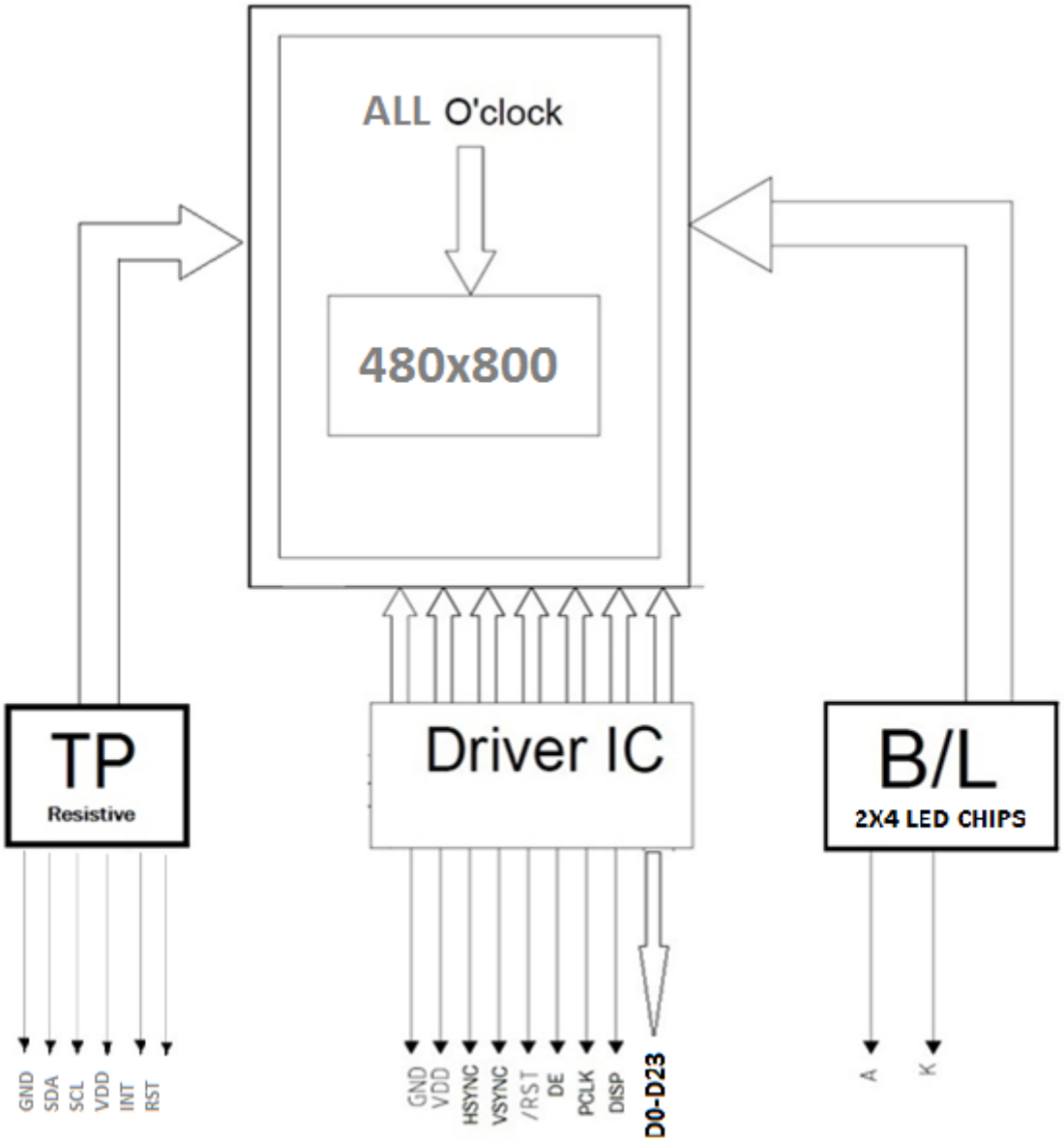
4. Circuit Block Diagram



5. Absolute Maximum Ratings(Ta=25℃)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{DD}	-0.3	3.3	V	1，2,3
Logic Signal Input /Output Voltage	V_{IOVCC}	-0.3	V_{DD}+0.3	V	
Operating Temperature	Top	-20	+70	℃	
Storage Temperature	Tst	-30	+80	℃	

Notes:

1. In case of below 0℃，the response time of liquid crystal (LC)becomes slower and the color
2. Of panel becomes darker than normal one. Level of retardation depends on temperature, because of LC´s characteristics.
3. 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 exceeded, the module will malfunction and cause poor reliability.

4. V_{DD} >V_{SS} must be maintained.

6. Electrical Specifications and Instruction Code

6.1 Electrical characteristics(Vss=0V ,Ta=25℃) (LCD IC Only)

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Note
Input voltage	'H'	V_{IH}	V_{DD}=2.8V	0.8V_{DD}	-	V_{DD}	V	
	'L'	V_{IL}	V_{DD}=2.8V	Vss	-	0.2V_{DD}	V	
Output Voltage	'H'	V_{OH}	-	0.8V_{DD}	-	V_{DD}	V	
	'L'	V_{OL}	-	Vss	-	0.2V_{DD}	V	
Current Consumption		I_{CC1}	Normal mode	-	15	20	mA	1,3
		I_{CC2}	Standby mode	-	-	5	mA	2

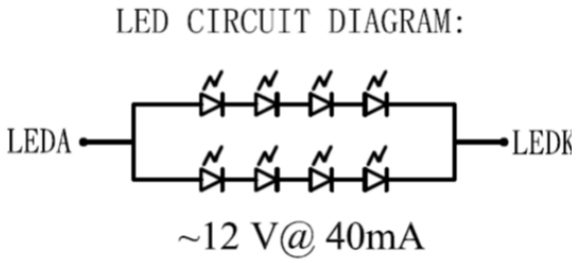
Note:
1: Display full white. Backlight on state.
2: IC on standby mode.
3: the default voltage is 2.8V, for N lights in series, the power is that the current multiply N.

6.2 LED backlight specification(VDD=2.8V,Vss=0V ,Ta=25℃)

Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage /Supply current		Vf/ If	If=15 mA	-	12		V	1
Reverse voltage		V_r	-	-	-	-	V	
Forward current	Normal	I_{pn}	8-chip 2X4 Series		15	20	mA	2
	Dimming	I_{pd}						
Reverse Current		I_r	-	-	-	-	μA	
Uniformity		△Bp	I_f=20mA	75%				
Color coordinate*		X		**	-	**	-	
		Y		**	-	**	-	

White LED CIRCUIT DIAGRAM:

e.g.



NOTE:

1 The LED ‘s driver mode needs to be constant current mode.

2 Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded .Functional operation should be restricted to the conditions described under normal operating conditions.

6.3 Interface Signals

RGB:

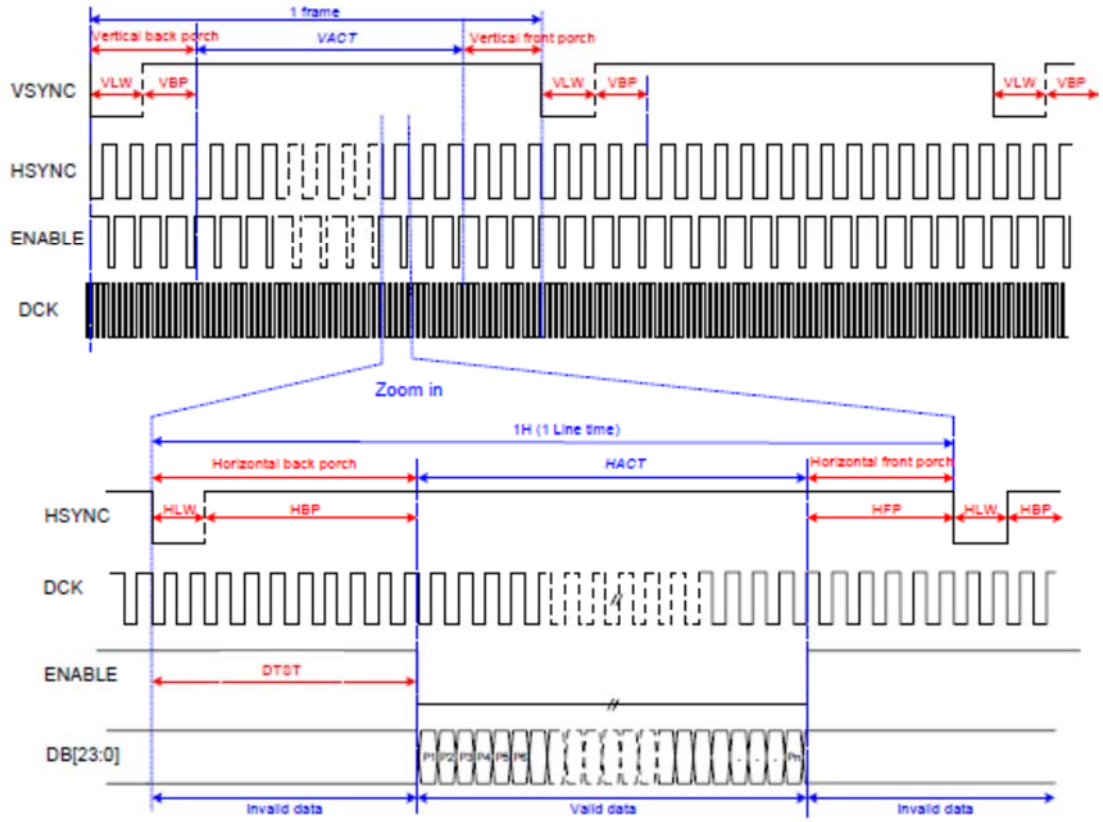
Pin No.	Symbol	I/O	Descriptions
1	LEDK	P	Cathode of LED Backlight
2	LEDA	P	Anode of LED Backlight
3	GND	P	Ground of LCD system
4	VCC	P	PowerSupply For LCD system
5	IOVCC	P	PowerSupply For LCD interface logic Circuits
6-13	R0-R7	I/O	Data Bus For RGB I/F.(Red)
14-21	G0-G7	I/O	Data Bus For RGB I/F.(Green)
22-29	B0-B7	I/O	Data Bus For RGB I/F.(Blue)
30	GND	P	Ground of LCD system
31	DE	I	Data Enable Signal For DE mode,and Active When High.Normally be Low.
32	DCLK	I	Dot Clock signal For RGB I/F.
33	HSYNC	I	Horizontal synchronizing Signal For RGB I/F.
34	VSYNC	I	Vertical Synchronizing Signal For RGB I/F.
35	RESET	I	Reset signal For LCD When Power supplied.Active When Low.
36	CS	I	LCD chip select signal,and Active When Low.
37	GND	P	Ground of LCD system
38	SDI	I	Data input Signal For Serial system I/F (SPI).
39	SCL	I	CLOCK signal For Serial system I/F(SPI).
40	GND	P	Ground of LCD system

6.4 Interface Timing Chart

Note: Please refer to ILI9806E data sheet for more detail

3.4.2. DPI Interface Timing

The timing chart of 24-/18-/16-bit DPI (RGB) interface mode is illustrated in Figure 12.



VLW : VSYNC Low pulse Width
HLW : HSYNC Low pulse Width
DTST : Data Transfer Startup Time
Pn : pixel 1, pixel 2···, pixel n.

Parameter	Symbols	Condition	Min.	Typ.	Max.	Units
Frame Rate	FR		54		66	fps
Horizontal Low Pulse width	HLW		1		-	DOTCLK
Horizontal Back Porch	HBP		2		126	DOTCLK
Horizontal Address	HACT			480		DOTCLK
Horizontal Front Porch	HFP		2		-	DOTCLK
Vertical Low Pulse width	VLW		1		126	Line
Vertical Back Porch	VBP		1		126	Line
Vertical Address	VACT				864	Line
Vertical Front Porch	VFP		1		255	Line
Data Clock	DCLK		16.6		41.7	MHz

Figure 12 DPI Interface Timing diagram[Note1,Note2]

7. Optical Characteristics（VDD=2.8V,Vss=0V ,Ta=25℃）

Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	--	250	-	Cd/m^2	1
Uniformity	△Bp			80%	-	-		1,2
Viewing Angle	θ1 (Φ=90° or270°)		Cr≥10	-60～+60			Deg	3
	θ2 (Φ=0° or 180°)			-45～+60				
Contrast Ratio	Cr		θ=0° Φ=0°		220		-	4
Response Time	T_r			-	--	**	Ms	5
	T_f			-	--	**	Ms	
Color of CIE Coordinate	W	x	θ=0° Φ=0°	--	-	--	-	1,6
		y		-	-	-	-	
	R	x		-	-	-	-	
		y		-	-	-	-	
	G	x		-	-	-	-	
		y		-	-	-	-	
	B	x		-	-	-	-	
		y		-	-	-	-	
NTSC Ratio	S			**	-			

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

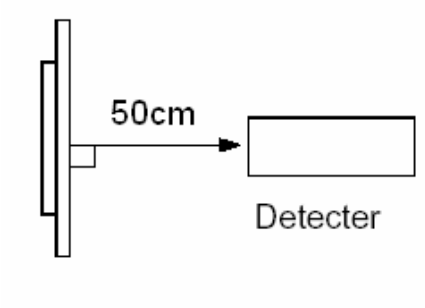
PR-705 (Φ8mm)

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.

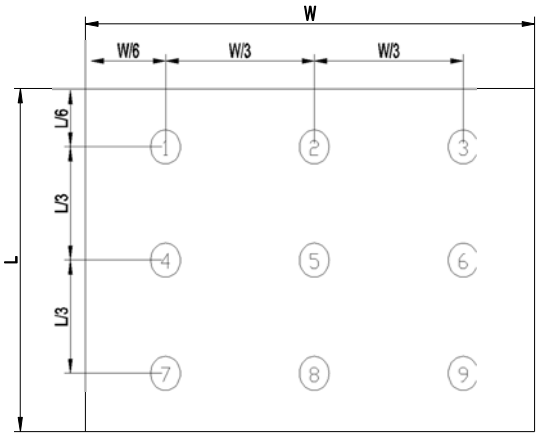


Note 2: The luminance uniformity is calculated by using following formula.

△Bp = Bp (Min.) / Bp (Max.)×100 (%)

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

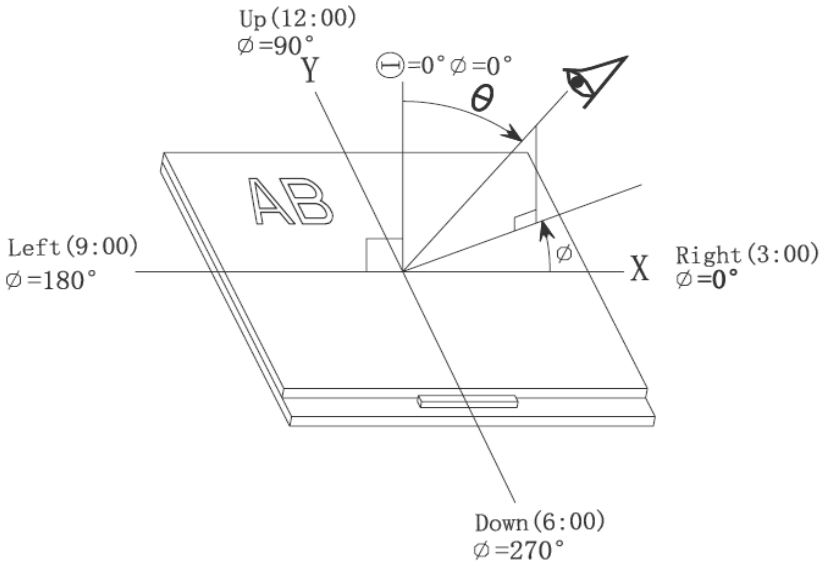
Bp (Min.) = Minimum brightness in 9 measured spots.



Measurement equipment PR-705 (Φ8mm)

Note 3: The definition of viewing angle:

Refer to the graph below marked by θ and Φ



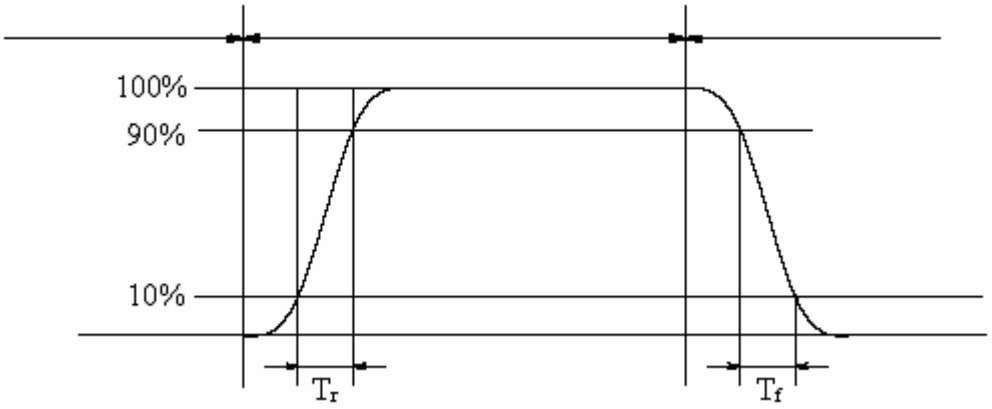
Note 4: The definition of contrast ratio (Test LCM using PR-705):

$$\text{Contrast Ratio(CR)} = \frac{\text{Luminance When LCD is at “White” state}}{\text{Luminance When LCD is at “Black” state}}$$

(Contrast Ratio is measured in optimum common electrode voltage)

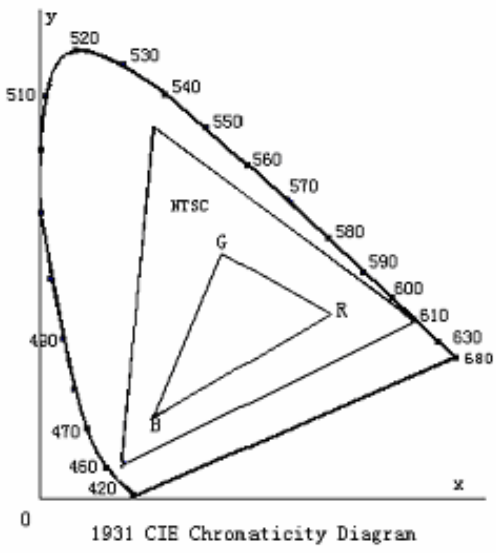
Note 5: Definition of Response time. (Test LCD using DMS501):

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.



The definition of response time

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



1931 CIE Chromaticity Diagram

Color gamut:

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

8. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80℃±2℃ 36H Restore 2H at 25℃ Power off	The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample shall be free from defects: 1.Air bubble in the LCD; 2.Sealleak; 3.Non-display; 4.missing segments; 5.Glass crack;
2	Low Temperature Storage	-30℃±2℃ 36H Restore 2H at 25℃ Power off	
3	High Temperature Operation	70℃±2℃ 36H Restore 2H at 25℃ Power on	
4	Low Temperature Operation	-20℃±2℃ 36H Restore 4H at 25℃ Power on	
5	High Temperature & Humidity Operation	60℃±2℃ 90%RH 48H Power on	
6	Temperature Cycle	−30℃ → 25℃ → 80℃ 30min 5 min 30min after 10cycle, Restore 2H at 25℃	
7	Vibration Test	10Hz~150Hz, 100m/s^2, 120min	
8	Shock Test	Half-sine wave,300m/s	
9	Drop Test(package state)	800mm, concrete floor,1corner,	
10	ESD Sensitivity test	Contact ±4KV， 150PF/330， 20times Air ±8KV,150PF/330， 20times	

NOTE:

1.The test samples should be applied to only one test item.

2.Sample size for each test item is 5~10pcs.

3.For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used.

4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part. Using ionizer(an antistatic blower) is recommended at working area in order to reduce electro-static voltage. When removing protection film from LCM panel, peel off the tag slowly(recommended more than one

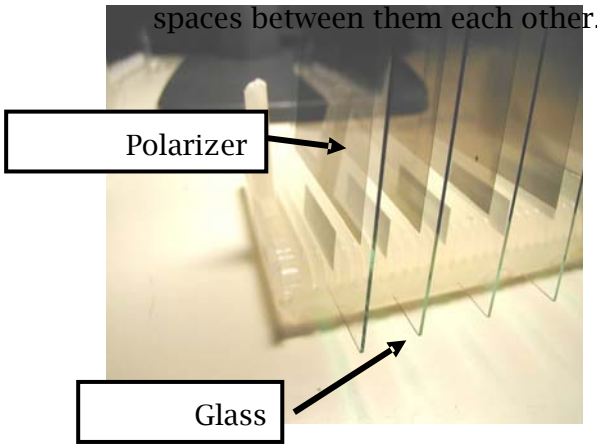
second) while blowing with ionizer toward the peeling face to minimize ESD which may damage electrical circuit.

5. EL evaluation should be excepted from reliability test with humidity and temperature: Some defects such as black spot/blemish can happen by natural chemical reaction with humidity and Fluorescence EL has.

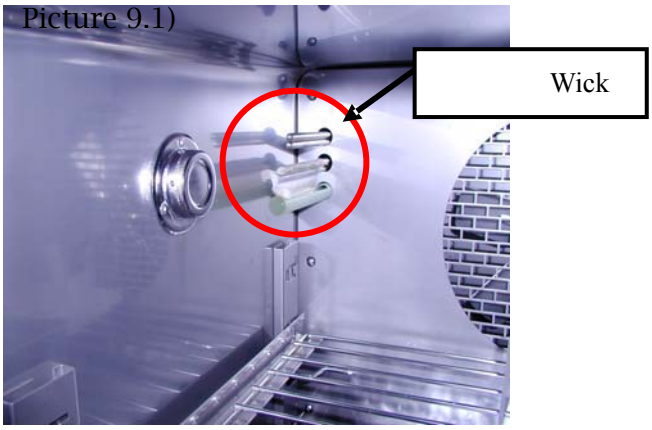
6. Polarizer test criteria

a. when testing avoid samples take out then return, It can cause water coagulation in Polarizer. Increase the distance of samples , And put samples before the wind.

b. When the samples are put into the test, put them upright so that the glasses keep spaces between them each other. (Picture 9.1)



Picture 9.1



Picture 9.2

c. Put samples into testing machine as small as possible so that it is drafty.

d. Do not put samples under wick because water will fall.(Picture 9.2)

e. Do not open testing machine except for taking them out in order to prevent moisture condensation.

7.Please use automatic switch menu(or roll menu) testing mode when test operating mode

8.The inspection terms after reliability test, as below

ITEM	Inspection standard
Contrast	CR>50%
IDD	IDD<200%
Brightness	Brightness>60%
Color Tone	Color Tone+/-0.05

9 Quality level

9.1 Classification of defects

Major defects (MA): A major defect refers to a defect that may substantially degrade usability for product applications, including all functional defects(such as no display,abnormaldisplay, open or missin segment,short circuit,missing component), outline dimension beyond the drawing, progressive defects and those affecting reliability.
Minor defects (MI): A minor defect refers to a defect which is not considered to be able to substantially degrade the product application or a defect that deviates from existing standards almost unrelated to the effective use of the product or its operation, such as black spot, white spot, bright spot, pinhole, black line, white line, contrast variation, glass defect, polarizer defect, etc.

9.2 Definition of inspection range

For dot defect of TFT LCD which is not smaller than 3 inches, dividing three areas to make a judgment (according to figure 1).
A area : center of viewing area
B area : periphery of viewing area
C area : Outside viewing area
For other defects, dividing two areas to make a judgment (according figure 2).
A zone : Inside Viewing area
B zone : Outside Viewing area
X1(A.A~V.A): 0mm X2(A.A~V.A): 0mm
Y1(A.A~V.A): 0mm Y2(A.A~V.A): 0mm

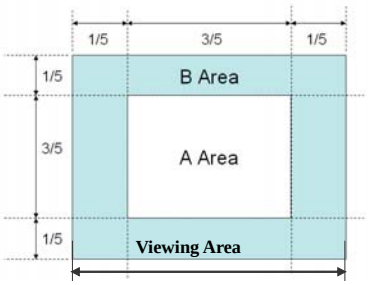


Figure 1

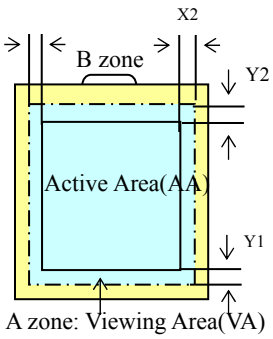


Figure 2

9.3 Inspection items and general notes

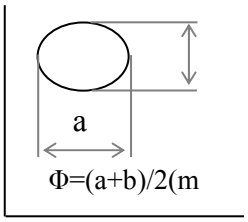
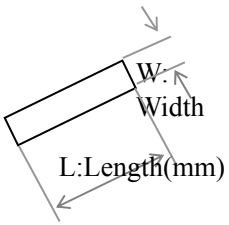
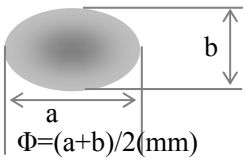
General notes	①Should any defects which are not specified in this standard happen, additional standard shall be determined by mutual agreement between customer and TSG DISPLAY. ②Viewing area should be the area which TSG DISPLAY guarantees. ③Limit sample should be prior to this Inspection standard. ④Viewing judgment should be under static pattern. ⑤Inspection conditions Inspection distance: 250 mm (from the sample) Temperature : 25±5 ºC Inspection angle : 45 degrees in 12 o'clock direction (all defects in viewing area should be inspected from this direction)	
Inspection items	Pinhole, Bright spot, Black spot, White spot, Black line, White Line, Foreign particle, Bubble	The color of a small area is different from the remainder. The phenomenon doesn't change with voltage
	Contrast variation	The color of a small area is different from the remainder. The phenomenon changes with voltage
	Polarizer defect	Scratch, Dirt, Particle, Bubble on polarizer or between polarizer and glass
	Dot defect (TFT LCD)	The pixel appears bright or dark abnormally when display

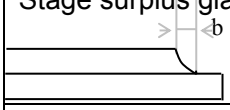
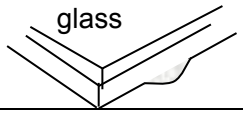
	Functional defect	No display, Abnormal display, Open or missing segment, Short circuit, False viewing direction
	Glass defect	Glass crack, Shaved corner of glass, Surplus glass
	PCB defect	Components assembly defect

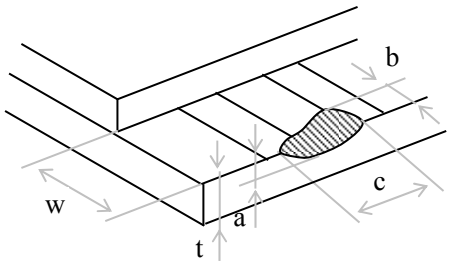
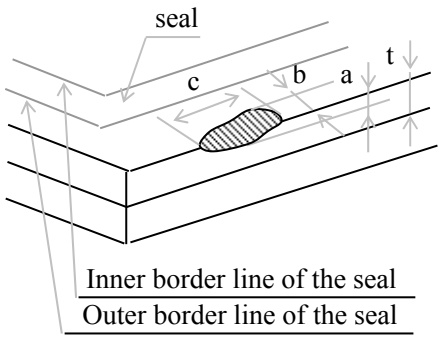
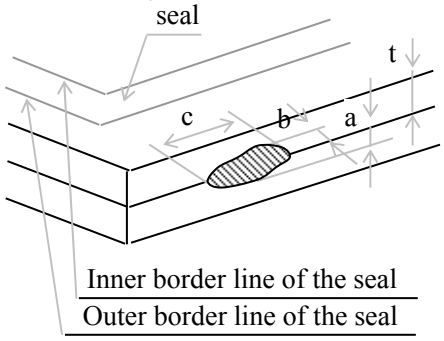
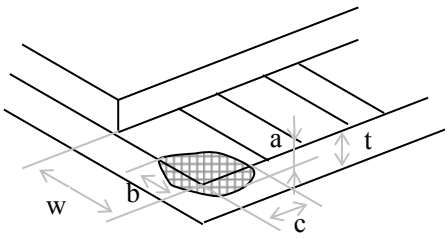
9.4 Outgoing Inspection level

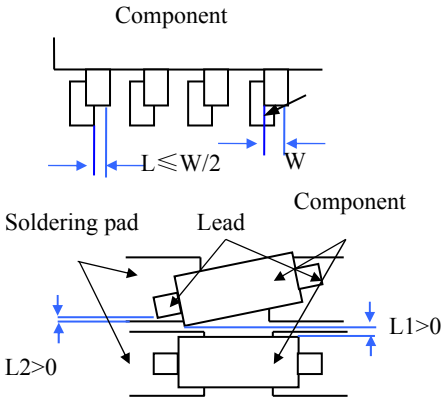
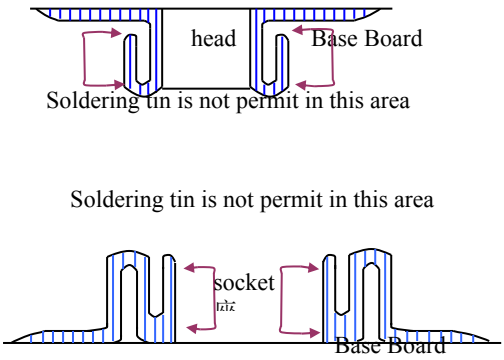
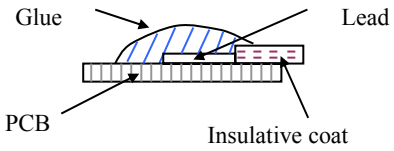
Outgoing Inspection standard	Inspection conditions	Inspection				
		Min.	Max.	Unit	IL	AQL
Major Defects	See 8.3 general notes	See 8.5			II	0.65
Minor Defects	See 8.3 general notes	See 8.5			II	1.5
Note：Sampling standard conforms to GB2828						

9.5 Inspection Items and Criteria

Inspection items			Judgment standard			
			Category		Acceptable number	
					A zone	B zone
1	Black spot, White spot, Bright Spot, Pinhole, Foreign Particle, Particle in or on glass, Scratch on glass		A	Φ≦0.10	Neglected	Neglected
			B	0.10<Φ≦0.20	2	
			C	0.20<Φ≦0.30	1	
			D	0.30<Φ	0	
			Total defective point(B,C)		3	
2	Black line, White line, and Particle Between Polarizer and glass, Scratch on glass		A	W≦0.01	Neglected	Neglected
			B	0.01<W≦0.03 L≦3.0	2	
			C	0.03<W≦0.05 L≦3.0	1	
			D	0.05<W	0	
			Total defective point(B,C)		3	
3	Contrast variation		A	Φ≦0.2	Neglected	Neglected
			B	0.2<Φ≦0.3	2	
			C	0.3<Φ≦0.4	1	
			D	0.4<Φ	0	
			Total defective point(B,C)		3	

<table>
<tr><td rowspan="5">4</td><td rowspan="5">Dot defect (if TFT LCD is used)</td><td>TFT LCD is smaller than 3 inches</td><td>LCD Class</td><td>Defect</td><td colspan="2">A area</td><td>B area</td></tr>
<tr><td rowspan="3">B</td><td>Bright dot</td><td colspan="2">2</td><td rowspan="3">Neglected</td></tr>
<tr><td>Dark dot</td><td colspan="2">3</td></tr>
<tr><td>Total</td><td colspan="2">4</td></tr>
<tr><td>TFT LCD between 3~10.4 inches</td><td>LCD Class</td><td>Defect</td><td>A area</td><td>B area</td><td>C area</td></tr>
<tr><td rowspan="3">B</td><td>Bright dot</td><td>2</td><td>2</td><td rowspan="3">Neglected</td></tr>
<tr><td>Dark dot</td><td>2</td><td>3</td></tr>
<tr><td>Total</td><td colspan="2">6</td></tr>
<tr><td colspan="7">Notes:
Bright dot: in R、G、B or dark display figure, the pixel appears bright.
Dark dot: in R、G、B or white display figure, the pixel appears dark.
Defect area must be less than an half size of the dot.</td></tr>
<tr><td>5</td><td colspan="2">Bubble inside cell</td><td colspan="2">any size</td><td>None</td><td>none</td></tr>
<tr><td rowspan="4">6</td><td rowspan="4">Polarizer defect (if Polarizer is used)</td><td>Scratch ,damage on polarizer, Particle on polarizer or between polarizer and glass.</td><td colspan="5">Refer to item 1 and item 2.</td></tr>
<tr><td rowspan="3">Bubble, dent and convex</td><td>A</td><td>Φ≦0.3</td><td>Neglected</td><td rowspan="3">Neglected</td></tr>
<tr><td>B</td><td>0.3<Φ≦0.7</td><td>2</td></tr>
<tr><td>C</td><td>0.7<Φ</td><td>0</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Surplus glass</td><td>Stage surplus glass
</td><td colspan="5">b≦0.3mm</td></tr>
<tr><td>Surrounding surplus glass
</td><td colspan="5">Should not influence outline dimension and assembling.</td></tr>
<tr><td>8</td><td colspan="2">Open segment or open common</td><td colspan="5">Not permitted</td></tr>
<tr><td>9</td><td colspan="2">Short circuit</td><td colspan="5">Not permitted</td></tr>
<tr><td>10</td><td colspan="2">False viewing direction</td><td colspan="5">Not permitted</td></tr>
<tr><td>11</td><td colspan="2">Contrast ratio uneven</td><td colspan="5">According to the limit specimen</td></tr>
<tr><td>12</td><td colspan="2">Crosstalk</td><td colspan="5">According to the limit specimen</td></tr>
<tr><td>13</td><td colspan="2">Black /White spot(display)</td><td colspan="5">Refer to item 1</td></tr>
<tr><td>14</td><td colspan="2">Black /White line(display)</td><td colspan="5">Refer to item 2</td></tr>
</table>

Inspection items			Judgment standard		
			Category(application: B zone)		Acceptable number
15	Glass defect crack	①The front of lead terminals 	A	a≤ t, b≤1/5W, c≤3mm	Max.3 defects allowed
			B	Crack at two sides of lead terminals should not cover patterns and alignment mark	
		②Surrounding crack—non-contact side 	b < Inner borderline of the seal		
		③ Surrounding crack— contact side 	b < Outer borderline of the seal		
		④Corner 	A	a ≦ t, b ≦ 3.0, c ≦ 3.0	
			B	Glass crack should not cover patterns u and alignment mark and patterns.	

Inspection items			Judgment standard Category(application: B zone)
16	PCB defect	Component soldering: No cold soldering、short、open circuit、burr、tin ball The flat encapsulation component position deviation must be less than 1/3 width of the pin (Pic.1); the sheet component deviation: Pin deviates from the pad and contact with the near components is not permitted（Pic.2）	
		lead defect: The lead lack must be less than 1/3 of its width; The lead burr must be less than 1/3 of the seam; Impurities connect with the near leads is not permitted	
		Connector soldering: Soldering tin is at contact position of the plug and socket is not permitted No foundation is scald Serious cave distortion on plug and socket contact pin is not permitted	
		Glue on root of the speaker receiver and motor lead: The insulative coat of the lead must join into the PCB; the protected glue must envelop to the insulative coat.	

10. Package Method

模块出货包装示意图：

