Reshine Display (HK) Technology Co., Limited

SPECIFICATION
规　格　书

客户名称 Customer	
产品型号 Part NO.	RXL035113-A
产品内容 Product type	Mode: Transmissive type .Normally white. TFT LCD Module LCD Module: Graphic 320RGB*480Dot-matrix
备注栏 Remarks	□APPROVAL FOR SEPCIFICATIONS ONLY ■APPROVAL FOR SEPCIFICATIONS AND SAMPLE
客户确认签章 Signature by Customer:	

PREPARED BY	CHECKED BY	APPROVED BY

Issue date: 2019/08/17

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2. REVISION HISTOR

Version	Revise record	Date
A	First issue	2019/08/17

Note : The Product and specifications are subject to change without any notice.
Please ask for the latest Product Standards to guarantee the satisfaction of our product requirements.

3. PRODUCT INFORMATION

3.1. Description

RXL035113-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 ICs, FPC, and a backlight unit. The 3.5'' display area contains 320 (RGB) x 480 pixels and can display up to 262K colors.

3.2. Features

☐Resolution: 320(RGB) x 480 Dots

☐1x6 LED backlight

3.4. General Specifications

Item	Specification	Unit	Remark
Display Mode	Normally White,Transmissive	-	-
Display Technology	α-Si TFT active matrix	-	-
Cover Outline Dimension	54.50(H) X 83.0(V) X1.97(T)	mm	-
Active Area	48.96 (H) X 73.44 (V)	mm	-
Resolution	320X(RGB)X480	dots	-
Pixel Pitch	0.153X0.153	mm	-
Pixel Configuration	RGB Stripe	-	-
Backlight	White LED	-	-
Luminance	(350)(Typ.)	cd/m2	-
Surface Treatment	Anti-Glare	-	-
Driver IC	ST7796S	-	-
Viewing Direction	12	o'clock	Note

4. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Remark
Power Voltage	VCC/IOVCC	-0.3	3.6	V	-
	VIN	-0.3	IOVCC+0.3		-
Storage Temperature	TST	-30	+80	°C	-
Operation Temperature	TOP	-20	+70	°C	-

Note:
4-1: No parameter is allowed to exceed to the temperature range.
4-2: 95% RH Max. (40 °C ≥ Ta) Maximum wet-bulb temperature at 39°C or less. (Ta >40 °C) No dew condensation.
4-3: Only operation is guarantied at operating temperature. Contrast, response time and another display quality are evaluated at +25°C.
4-4: The ambient temperature, when backlight is on. (Reference)

5. ELECTRICAL SPECIFICATIONS(Ta=25°C)

5.1. TFT-LCD Panel Driving Section

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power voltage	VCC	2.3	2.8	3.3	V	-
Input logic high voltage	VIH	0.7IOVCC	-	IOVCC	V	-
Input logic low voltage	VIL	-0.3	-	0.3IOVCC	V	-
Output logic high voltage	VOH	0.8IOVCC	-	-	V	
Output logic low voltage	VOL	-	-	0.2IOVCC	V	
I/O power supply	IOVCC	1.65	1.8/2.8	3.3	V	
Current for Drive	ICC	-	4.7	10.6	mA	-

5.2.Backlight

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Average Luminous	Iv	5500	6000	-	cd/m2	
Chromaticity	X	0.260	0.310	0.360		
	Y	0.280	0.330	0.380		
LED Voltage	Vf	-	3.2	-	V	
LED Current	I_{LED}	-	120	-	mA	
Luminous TOLERANCE	IV-M	70	-		%	
LED life time		20,000	-	-	Hr	

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;

6. OPTICAL SPECIFICATIONS(Ta=25℃)

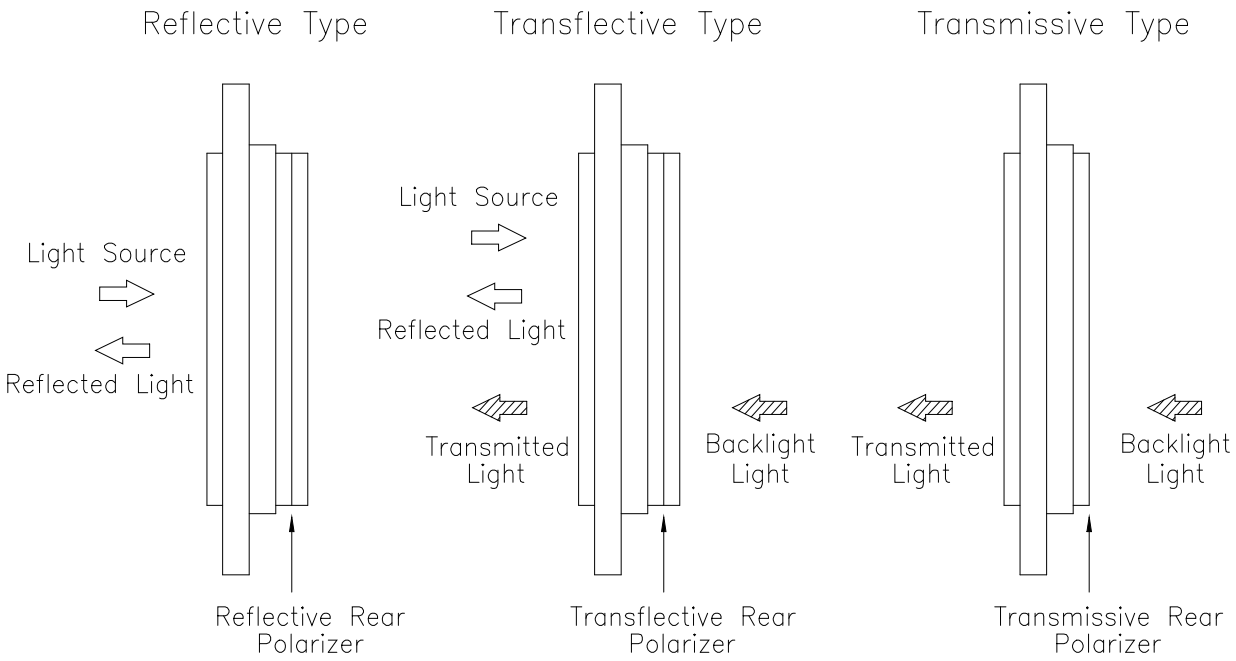
Item		Symbol	Min.	Typ.	Max.	Unit	Remarks
Contrast Ratio		CR	-	500	-		Fig.1
Brightness			300	350	-	cd/m2	Full White Pattern
Brightness Uniformity			70	-	-	%	Full White Pattern Fig.1,2
Response Time		Tr+Tf	-	20	40	ms	Fig.3
Color Coordinate	WHITE	Wx	0.280	0.300	0.320		IBL=120mA
		Wy	0.311	0.331	0.351		Full White Pattern
view angle		θl	-	70	-	Degree	Fig.4 Center (C/R>5)
		θr	-	70	-		
		θu	-	60	-		
		θd	-	60	-		

Note:
1. Contrast Ratio(CR) is defined mathematically as :

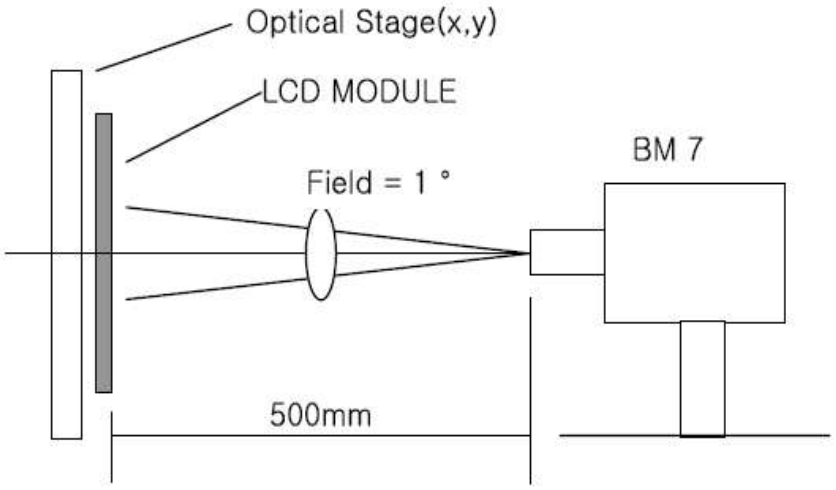
$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white. For more information see FIG 1.
3. Response time is the time required for the display to transition from black to white (Rise Time, Tr) and from white to black(Decay Time, Tf). For additional information see FIG 3.
4. Viewing angle is the angle at which the contrast ratio is greater than 5. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG
5. Optimum contrast is obtained by adjusting the LCD Threshold voltage (Vth& Vsat)

7. VIEWING MODES



8. ELECTRO-OPTICAL CHARACTERISTICS TEST METHOD



<Transmissive Mode>

FIG. 1 Optical Characteristic Measurement Equipment and Method

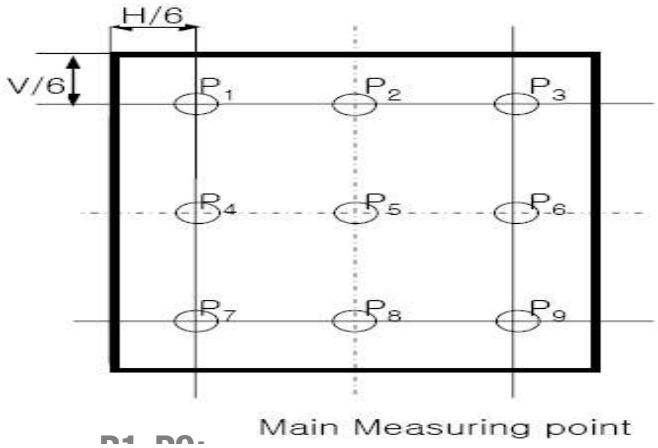


Fig. 2 Measuring Points

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".

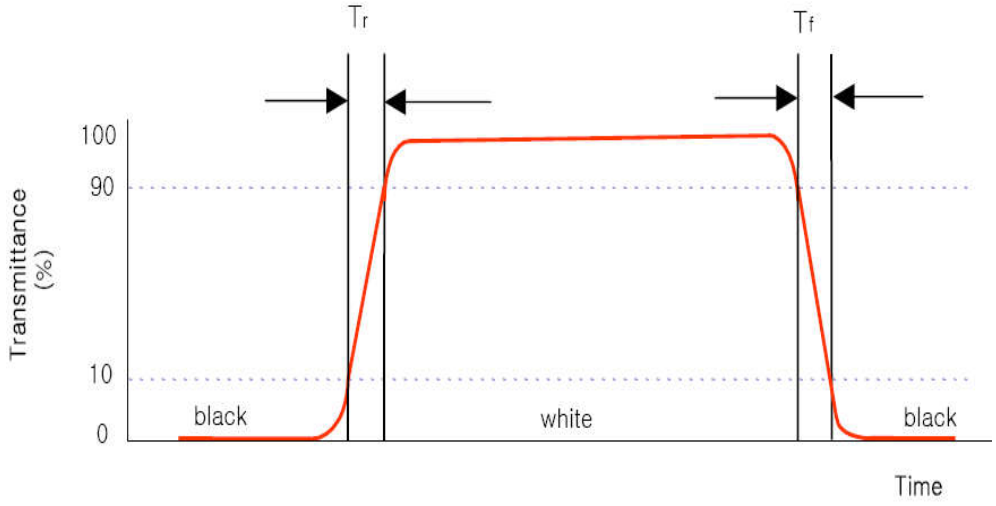
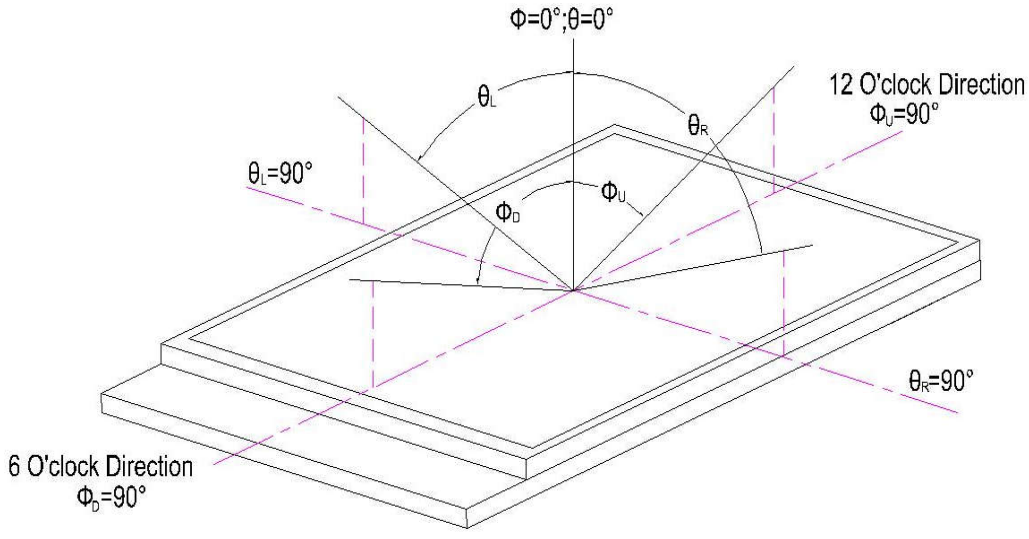


FIG.3 The definition of Response Time



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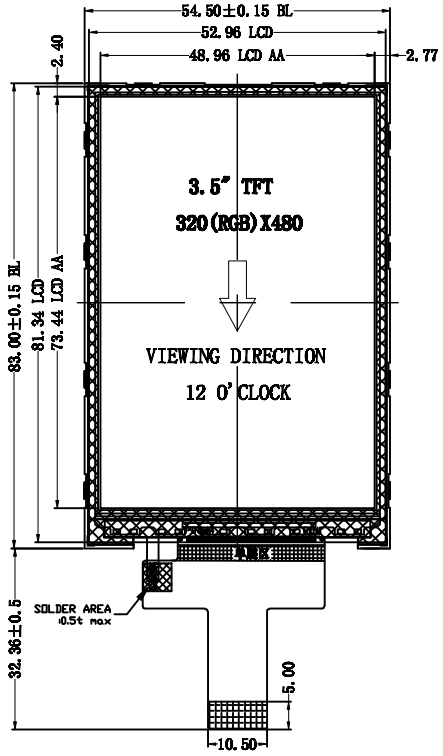
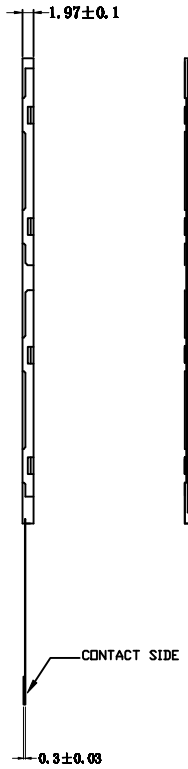
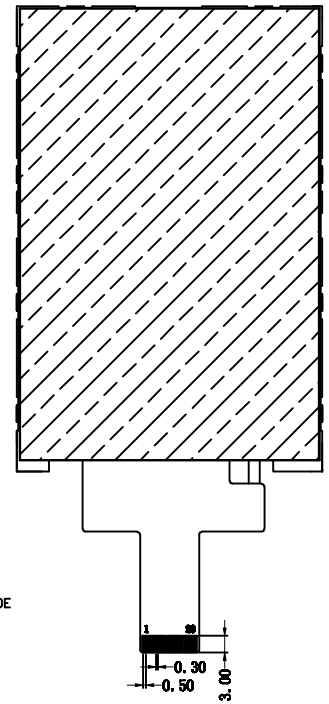
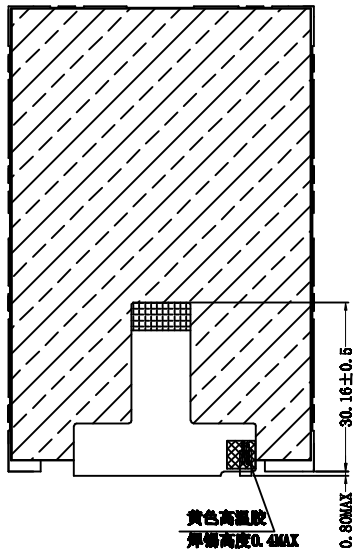


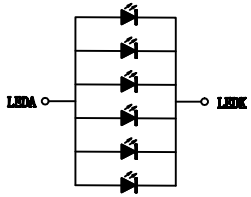






PIN	SYMBOL
01	GND
02	DON
03	DOP
04	GND
05	CLKN
06	CLKP
07	GND
08	GND
09	IOVCC
10	RESET
11	TE
12	VCC
13	VCC
14	GND
15	GND
16	LEDK
17	LEDK
18	LEDA
19	LEDA
20	GND

LCM brightness：350cd/m²



BACKLIGHT CIRCUIT DIAGRAM 120mA VF=3.2V

Display Type	TFT NORMAL WHITE TRANSMISSIVE
Main driver IC	ST7796S
Operation Temperature	-20° C ~ 70° C
Storage Temperature	-30° C ~ 80° C
Connector	
Interface	MIPI
Backlight Color	WHITE
Backlight Forward Voltage	Vf=3.2V(TYP)(IF=120mA)
CUSTOMER PROJECT NO:	

NOTE:
1. GENERAL TOLERANCE: ±0.2.
2. (...) IS REFERENCE DIMENSION.
3. COMPLIABLY RoHS.
4. The foam on the client shell needs to enter the glass unilateral 0.3MM (MIN) to prevent light leakage
5. Customers need to ensure that the back of the touch screen is at least 0.3MM above the surface of the LCD glass (non-adherent)

SYMBOL	AMENDMENT	SIGN	DATE
B			
A	FIRST ISSUE	WJ	20190813

DRAWN	WJ
CHECKED	LQ
APPROVED	
CUSTOMER'S APPROVAL	

TITLE: MODULE SPEC.

DRAWING NO. RXL035113-A

PROJECT NO.	RXL035113-A	VER.	A
UNIT	mm	SCALE	FIT
3rd Angle		SHEET	1 OF 1

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10. PIN DESCRIPTION

Interface NO.	Symbol	I/O or connect to	Description	When not in use
1	GND	PWR SUPPLY	Power ground.	-
2	D0N	I/O	Negaitive polarity of low voltage differential data signal.	GND/IOVCC
3	D0P	I/O	Positive polarity of low voltage differential data signal.	-
4	GND	PWR SUPPLY	Power ground.	GND/IOVCC
5	CLKN	I/O	Negaitive polarity of low voltage differential clock signal.	GND/IOVCC
6	CLKP	I/O	Positive polarity of low voltage differential clock signal.	GND/IOVCC
7-8	GND	PWR SUPPLY	Power ground.	GND/IOVCC
9	IOVCC	PWR SUPPLY	Power supply for I/O system, 1.65V~3.3V.	GND/IOVCC
10	RESET	I/O	Reset pin.	-
11	TE	I/O	Tearing effect output.	GND/IOVCC
12-13	VCC	PWR SUPPLY	Power supply for analog and booster circuits, 2.5V~3.3V.	-
14-15	GND	PWR SUPPLY	Power ground.	GND/IOVCC
16	LEDK	LED DRIVER	Backlight cathode.	-
17	LEDK	LED DRIVER	Backlight cathode.	-
18	LEDA	LED DRIVER	Backlight anode.	-
19	LEDA	LED DRIVER	Backlight anode.	-
20	GND	PWR SUPPLY	Power ground.	-

11. RELIABILITY

The LCD module shall be designed to meet a minimum working life value of 50000 hours with normal. (25°C in the room without sunlight)

11.1 TESTS

No.	Item	Condition	Criterion
1	High Temperature Operating	70℃±2℃ 120Hrs	。No defect of operational function in room temperature are allowable; 。IDD of LCM in pre-and post-test should follow specification
2	Low Temperature Operating	-20℃±2℃ 120Hrs	
3	High Temperature/ Humidity Operating	60℃±2℃ ,90%RH ,120 Hrs	
4	High Temperature Non-Operating	80℃±2℃ 240Hrs	
5	Low Temperature Non-Operating	-30℃±2℃ 240Hrs	
6	Temperature Cycling Non-Operating	-30℃±2℃(30Min)↔ 80℃±2℃(30Min) 10 CYCLES	
7	Vibration Test	Frequeny:10HZ-55HZ-10HZ Amplitude:1.5mm,X、Y、Z direction for total 3hours.(Packing condition)	
8	Dropping Test	Drop to the ground from 1m height, one time, every side of carton. (Packing condition)	
9	ESD Test	Voltage: ±3KV R:330Ω C:150pF Air discharge,10time	

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

2. Sample size for each test item is 5-10 pcs;
3. In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part;
4. Failure judgment criterion: Basic specification, Electrical characteristic, Mechanical characteristic, Optical characteristic;
5. Judgments should be mode after exposure in room temperature for two hours.

12. HANDLING PRECAUTIONS

(1) Safety

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

(2) Limited Warranty

Unless agreed between RX and the customer, RX will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with RX acceptance standards(copies available upon request) for a period of one year from date of production. Cosmetic/visual defects must be returned to RX within 90 days of shipment. Confirmation of such date shall be based on date code on product. The warranty liability of RX to repair and /or replace on the terms set forth above. RX will not be responsible for any subsequent or consequential events.

(3) Handling

A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability

C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.

D. Provide a space so that the panel does not come into contact with other components.

E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.

F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.

G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.

H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

(4) Static Electricity

A. Ground soldering iron tips, tools and testers when they are in operation.

B. Ground your body when handling the products.

C. Power on the LCD module before applying the voltage to the input terminals.

D. Do not apply voltage which exceeds the absolute maximum rating.

E. Store the products in an anti-electrostatic bag or container.

(5) Storage

A. Store the products in a dark place at +25℃±10℃ with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.

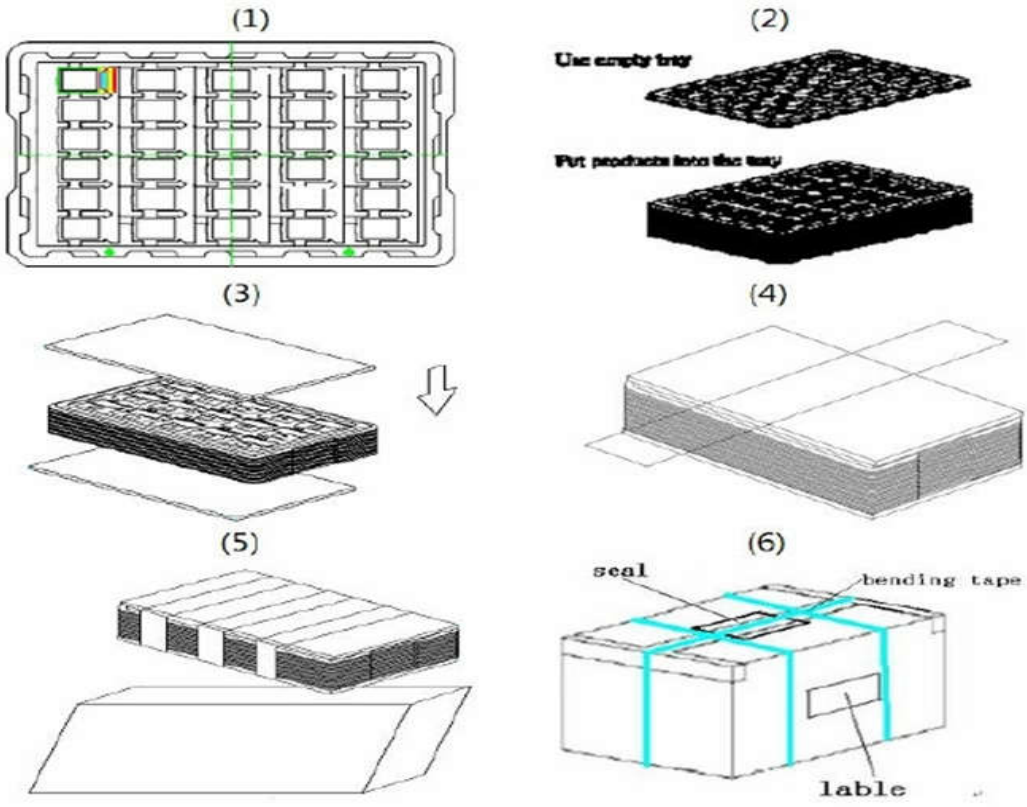
B. Storage in a clean environment, free from dust, active gas, and solvent.

(6) Cleaning

A. Do not wipe the touch panel with dry cloth, as it may cause scratch.

B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

13. PACKAGE METHOD



1. Put module into tray cavity.
2. Tray stacking.
3. Put 1 foam under the tray stack and 1 foam above.
4. Fix the cardboard to the tray stack with adhesive tape.
5. Put the tray stack into carton.
6. Carton sealing with adhesive tape.

13.2 Storage Method

1. Store in an ambient temperature of 23°C±5°C, and in a relative humidity of 55%±15%. Don't exceed 12 months and expose to sunlight or f luorescent light.
2. Store in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.