Shenzhen Hongcai Technology Co. Ltd.

APPROVAL SHEET

Customer	
Part NO.	HC-350HS5401
Remarks	□Appoval For Specification Only ■Appoval For Specification And Simple

CUSTOMER			HONGCAI		
APPROVED	**CHECKED**	**PREPARED**	**APPROVED**	**CHECKED**	**PREPARED**

ADD:4F,#1 Building, TianFuAn Industrial Park, LeZhuJiao,Road,XiXiang, BaoAn District, ShenZhenGuangDong, China.

TEL：0755-2331 1561

FAX：0755-2359 5249

Email：jinyg@kingcai.com.cn

http: www.kingcai.cn

Revision Record

Rev No	Date	Description
V1.0	2021-01-30	Preliminary Specification Release.

Contents

1 General specification

2 Mechanical Drawing

3 Pin Assignments

4 Electrical Specification

5 Measurement system

6 Reliability Test Items

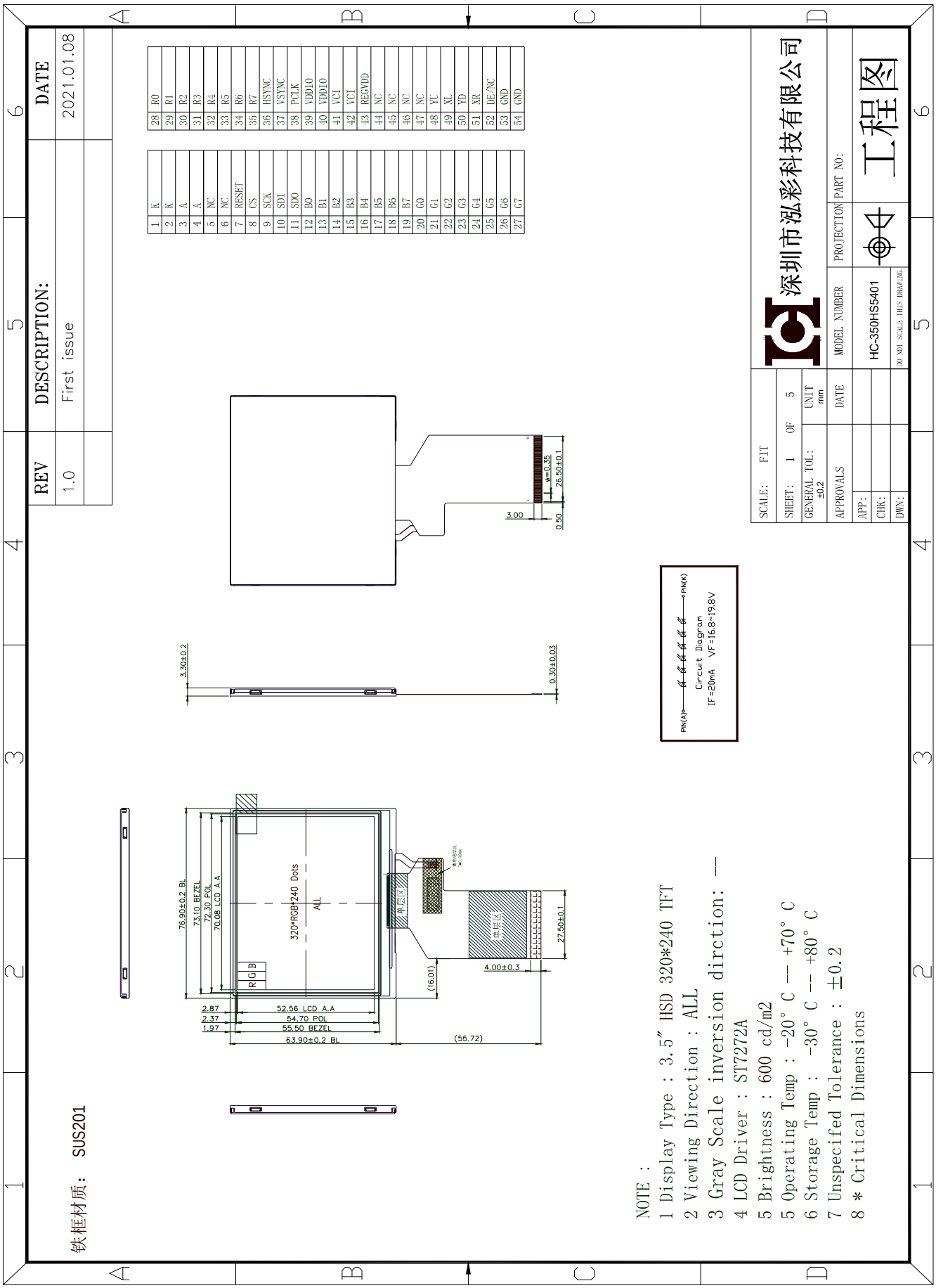
7 Suggestions for using LCD modules

8 Packing and Storage Specification(Reference Only)

1. General Specifications

Item	Contents	Unit
Size	3.5 TFT	inch
LCM Dimension	76.84（W）* 63.84（H） * 3.30(T)	mm
LCD Active Area	70.08 * 52.56	mm
Number OfDots	320 * RGB * 240	pixel
LCD Type	a-Si TFT	
Viewing Direction	ALL	
Driver IC	ST7272A	
Interface Type	RGB	
Operating Temperature	-20℃~ 70℃	
Storage Temperature	-30℃~ 80℃	
Backlight Type	6 LEDs	
Weight	TBD	
Display Mode	Normally Black	

2. MechanicalDrawing



1	K
2	K
3	A
4	A
5	NC
6	NC
7	RESET
8	CS
9	SCK
10	SDI
11	SDO
12	B0
13	B1
14	B2
15	B3
16	B4
17	B5
18	B6
19	B7
20	G0
21	G1
22	G2
23	G3
24	G4
25	G5
26	G6
27	G7

28	R0
29	R1
30	R2
31	R3
32	R4
33	R5
34	R6
35	R7
36	HSYNC
37	VSYNC
38	PCLK
39	VDD10
40	VDD10
41	VCI
42	VCI
43	REGVDD
44	NC
45	NC
46	NC
47	NC
48	VC
49	XL
50	YD
51	XR
52	DE/NC
53	GND
54	GND

3. Pin Assignments

NO.	Symbol	Description
1	K	BACKLIGHT CATHODE
2	*K*	BACKLIGHT CATHODE
3	A	BACKLIGHT ANODE
4	A	BACKLIGHT ANODE
5-6	NC	Not connect
7	RESET	Reset Pin
8	CS	Chip select
9	SCK	Serial clock input
10	SDI	Serial data input
11	SDO	Serial data output
12-19	B0-B7	Blue data input
20-27	G0-G7	Green data input
28-35	R0-R7	Red data input
36	HSYNC	Horizontal sync signal
37	VSYNC	Vertical sync signal
38	PCLK	Pixel clock input pin
39-40	VDDIO	Power Supply for IO
41-42	VCI	Power Supply
43	REGVDD	Not connect
44-47	NC	Not connect
48	YU	Touch Panel Up (Not connect)
49	XL	Touch Panel Left (Not connect)
50	YD	Touch Panel Down (Not connect)
51	XR	Touch Panel Right (Not connect)
52	DE	Data input enable
53-54	GND	Ground

4. Electrical Specification

4.1 DC Characteristics

Item	Symbol	Min	Typ	Max	Unit
TFT gate on voltage	VGH	--	15	--	V
TFT gate off voltage	VGL	--	-10	--	V
TFT common electrode Voltage	Vcom	--	0	--	V

4.2 AC Characteristics

Refer to the SPEC of ST7272A

4.3 Typical Operation Conditions

Item	Symbol	Min.	Typ.	Max.	Unit
Analog Supply Voltage	VCI	3.0	3.3	3.6	V
Digital Supply Voltage	VDD	3.0	3.3	3.6	V
I/O Supply Voltage	IOVCC	3.0	--	3.6	V
Input High Voltage	VIH	0.7*IOVCC	-	IOVCC	V
Input Low Voltage	VIL	0	-	0.3*IOVCC	V
Output High Voltage	VOH	--	-	-	V
Output Low Voltage	VOL	-	-	--	V

4.4 Backlight Circuit Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
LED Current	IB	-	20	-	mA
LED Voltage	Vf	16.8	--	19.8	V
CIE	X	TBD	TBD	TBD	
	Y	TBD	TBD	TBD	
Brightness of LCM	L	--	600	--	cd/m2

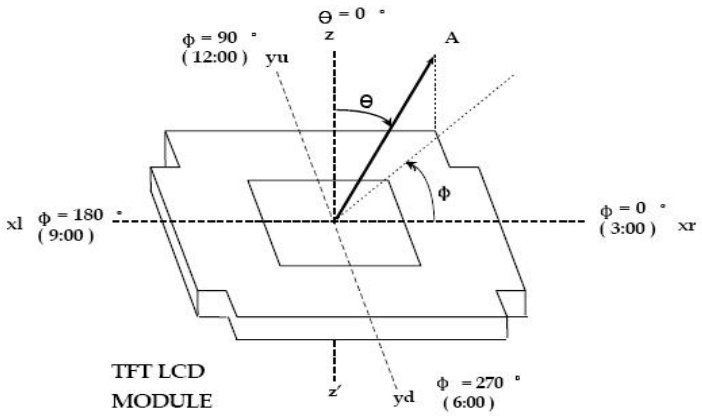
4.5Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (with Polarizer)		T (%)	Θ=0 Normal viewing angle	(5.5)	(6.2)	—	%	Measuring with normal polarizer , Reference Only Base on Vop=5.1V
Transmittance (without Polarizer)		T (%)		19.1	21.3	—	%	
Contrast Ratio		CR		640	800	—	—	(1)(2)
Response Time		$T_{R+}T_F$		—	30	40	msec	(1)(3)
Color Gamut	(%)			55	60	—	%	C-light
Color Chromaticity (CIE1931)	White	W_x		(0.297)	(0.317)	(0.337)	—	(1)(4) CF glass C-light
		W_y		(0.319)	(0.339)	(0.359)		
	Red	R_x		(0.626)	(0.646)	(0.666)	—	
		R_Y		(0.312)	(0.332)	(0.352)		
	Green	G_x		(0.303)	(0.323)	(0.343)	—	
		G_Y		(0.547)	(0.567)	(0.587)		
	Blue	B_x		(0.114)	(0.134)	(0.154)	—	
		B_Y		(0.101)	(0.121)	(0.141)		
Viewing Angle	Hor.	Θ_L	CR>10	70	80	—	—	(1)(4) Measuring with normal polarizer , Reference Only
		Θ_R		70	80	—		
	Ver.	Θ_U		70	80	—		
		Θ_D		70	80	—		
Optima View Direction		Free						(5)

Note : Color chromaticty is for LCD only.

5.Measurement system

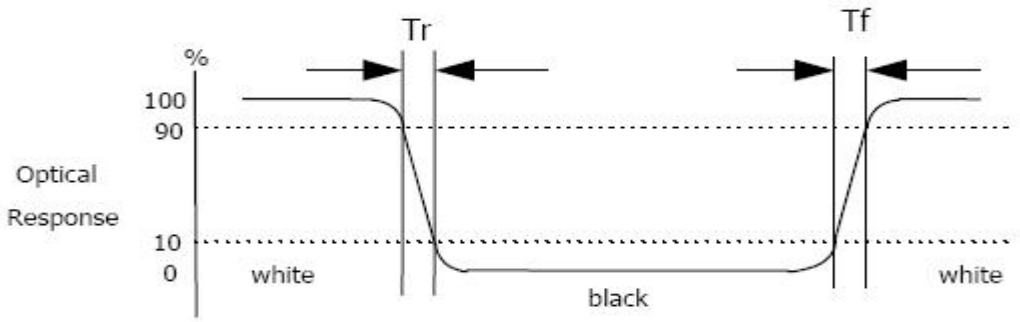
5.1 LCM Viewing Angle



Viewing angle is the angle at which the contrast ratio is greater than 10.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

5.2 Response time



Response time is the time required for the display to transition from white to black (Rising time, Tr) and from black to white (Falling time, Tf) for additional information.

5.3 Contrast Ratio (CR)

Contrast Ratio (CR) is defined mathematically as:

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

Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white.

6.Reliability Test Items

Test Item	Test Condition	Test result determinant gist
High temperature storage	80±3℃，48H；	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD; 2.Non-display; 3.Glass crack; 4. The electrical characteristics requirements shall be satisfied.
Low temperature storage	-30±3℃，48H；	
High temperature operation	70±3℃，48H；	
Low temperature operation	-20±3℃，48H；	
High temperature /humidity	60℃±3℃,90%±3%RH，48H；	
Thermal Shock	-20℃/0.5h~+70℃/0.5h for a total 24 cycles；	
Vibration Test	Frequency 10Hz~55Hz~10Hz Amplitude：1.5mm, X，Y，Z direction for total 1H；(Packing condition)	
ESD test	±4KV, Human Body Mode, 150pF/330Ω；±8KV, Air Mode, 150pF/330Ω；	

Remark：

1. The test samples should be applied to only one test item.
2. Sample size for each test item is 2pcs.
3. Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

7. Suggestions for using LCD modules

7.1 The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.

7.2 If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.

7.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).

7.4 The polarizer covering the display surface of the LCD module is soft and easily scratched.Handle this polarizer carefully. Do not touch, push or rub the exposedpolarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.

7.5 If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents

- Isopropyl alcohol
- Ethyl alcohol

Do not scrub hard to avoid damaging the display surface.

7.6 Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.

- Water
- Ketone
- Aromatic solvents

Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil and fats.7.7 Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

7.8 Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I O cable or the backlight cable.

7.9 Do not attempt to disassemble or process the LCD module.

7.10 NC terminal should be open. Do not connect anything.

7.11 If the logic circuit power is off, do not apply the input signals.

7.12 Electro-Static Discharge Control，Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Before removing LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the LCD modules.
- Tools required for assembling, such as soldering irons, must be properly grounded.Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission ofelectromagnetic waves produced sparks coming from the commutator of the motor.

- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.

- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off

this protective film since static electricity may be generated.

7.13 Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

- Do not alter, modify or change the shape of the tab on the metal frame. -

- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

- Do not damage or modify the pattern writing on the printed circuit board. -

- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.

- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

- Do not drop, bend or twist the LCM.

8.Storage Method

8.2.1.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 fluorescent light.

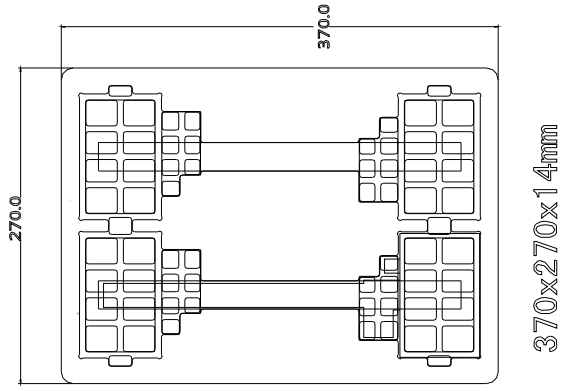
8.2.2.Store in a clean environment, free from dust, active gas, and solvent.

8.2.3 LCM module is stored in warehouse，Store in antistatic container， There may be air bubbles between the protective film on the surface of polarizer and polarizer。It can only be found under LED light， Before production，IQC should be inspected directly by LED light，If residual traces are found, alcohol should be used to wipe them。

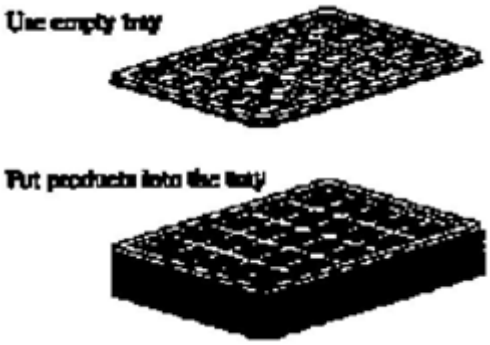
9.Packing and Storage Specification(Reference Only)

9.1 Packing Method

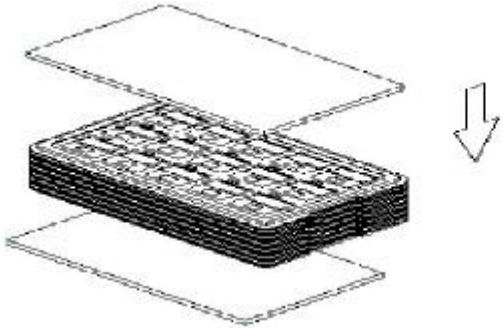
(1)



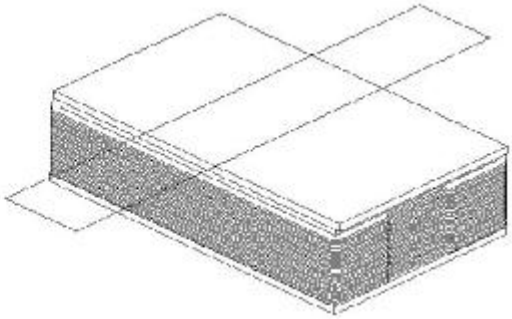
(2)



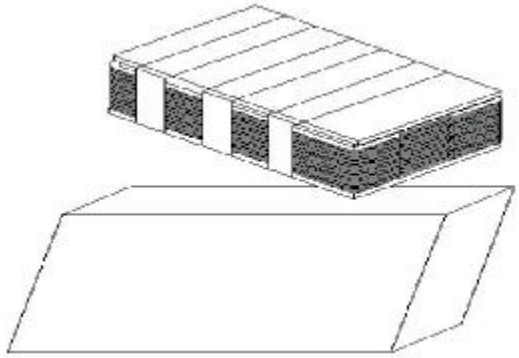
(3)



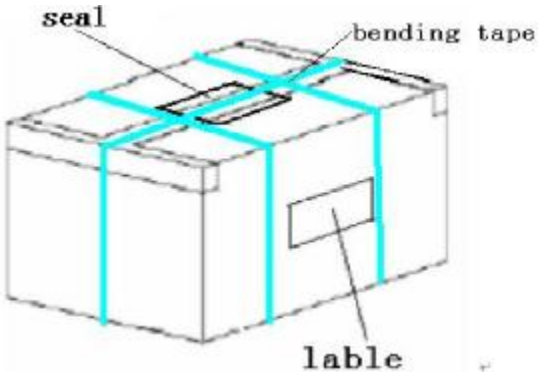
(4)



(5)



(6)



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.