

# Specification Sheet

**Model No. :** MTF0397SWI-06

**Description :** 3.97 inch 480 x 800 Pixel Resolution

MIPI Interface TFT LCD Module

Option Capacitance Touch Panel

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**Document revision history:**

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
01	2016.06.12	First Release.	QSC	QSC

## 2. General Description

3.97”(diagonal), 480 x3 RGB x 800 dots, 16.7M colors, Transmissive, TFT LCD module.

Viewing Direction: ALL clock.

Driving IC:OTM8019A

MIPI interface

Logic voltage: 2.8V (typ.).

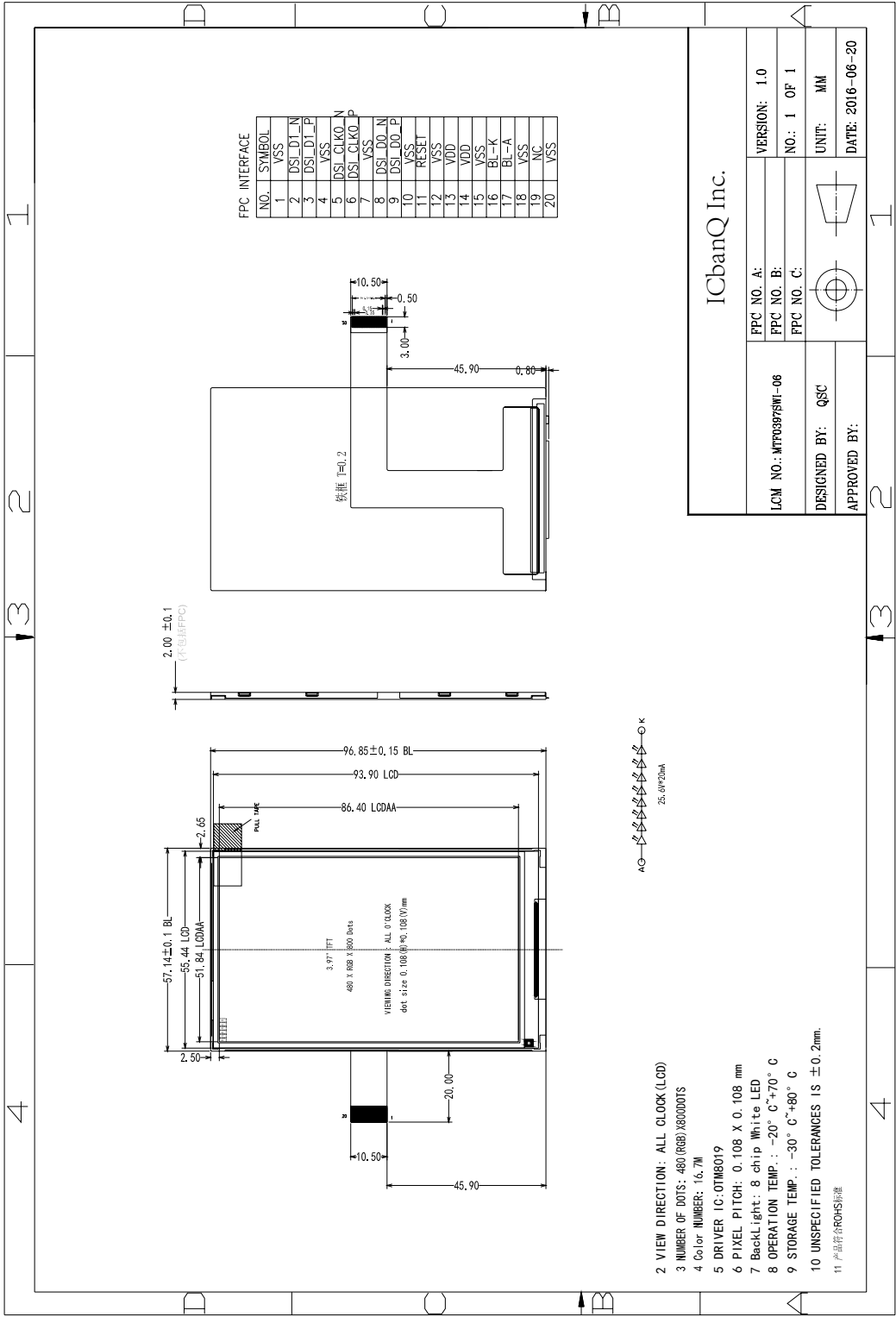
Without touch panel.

## 3. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

Parameter		Specifications	Unit
Outline dimensions		57.14(W) x 96.85(H) x2.0+ 0.05(D)	mm
	active area	51.84(W)*86.4(H)	mm
	Display format	480x3 RGB x 800	dots
	Color configuration	RGB stripes	-
	Dot pitch	0.108(RGB)(W) x 0.108(H)	mm
Weight		TBD	grams



#### 4. Interface signals

PinNo.	Symbol	Description
1	GND	Ground
2	D1N	MIPI_DSI data lane 1 negative _end input pin
3	D1P	MIPI_DSI data lane 1 positive end input pin
4	GND	Ground
5	CN	MIPI_DSI clock lane negative_ end input pin
6	CP	MIPI_DSI clock lane positive_ end input pin
7	GND	Ground
8	D0N	MIPI_DSI data lane 0 negative _ end input pin
9	D0P	MIPI_DSI data lane 0 positive_ end input pin
10	GND	Ground
11	RESET	Reset signal pin
12	GND	Ground
13	IOVCC	I/O supply voltage range 1.8V
14	VCC	Power supply for the system 2.8V
15	GND	Ground
16	LEDK	Anode K
17	LEDA	Anode A
18	GND	Ground
19	NC	
20	GND	Ground

## 5. Absolute Maximum Ratings

### 5.1 Electrical Maximum Ratings – for IC Only

Table 3: Electrical Maximum Ratings – for IC

Parameter	Symbol	Min.	Max.	Unit	Note
Power supply voltage (VDD)	VCC	-0.3	+3.6	V	1

Note:

1. VCC, GND must be maintained.
2. The modules may be destroyed if they are used beyond the absolute maximum ratings.

## 6. Electrical Specifications

### Typical Electrical Characteristics

At Ta = 25 °C, VCC=IOVCC= 2.6V to 3.3V, GND=0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (logic)	VDD-GND			2.8		V
Supply current (Logic & LCD)	ICC	VDD=2.8V	-	-	10	mA
Supply voltage of white LED backlight	VLED =V(BL+)- V(BL-)	Forward current =20mA Number of LED dies = 8	24.0	25.6	26.4	V
Luminance (on the module surface)			-	TBD	-	cd/m <sup>2</sup>

## 7. Optical Characteristics

Table 7: Optical specifications

Items		Symbol	Condition	Specifications			Unit	Note
				Min.	Typ.	Max.		
brightness		CR		200	220	-	-	
Response Time		T <sub>R</sub>		-	4	8	ms	
		T <sub>F</sub>		-	12	24	ms	
Chromaticity	Red	X <sub>R</sub>		0.604	0.634	0.664	-	
		Y <sub>R</sub>		0.298	0.328	0.358	-	
	Green	X <sub>G</sub>		0.264	0.294	0.324	-	
		Y <sub>G</sub>		0.547	0.577	0.607	-	
	Blue	X <sub>B</sub>		0.107	0.137	0.167	-	
		Y <sub>B</sub>		0.104	0.134	0.164	-	
	White	X <sub>W</sub>		0.272	0.302	0.332	-	
		Y <sub>W</sub>		0.305	0.335	0.365	-	
Viewing angle	Hor.	1(3 o'clock)	Center CR≥10	-	80	-	deg.	
		2(9 o'clock)		-	80	-		
	Ver.	2(12 o'clock)		-	80	-		
		1(6 o'clock)		-	80	-		
Optima View Direction					All			

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L<sub>63</sub> / L<sub>0</sub>

L<sub>63</sub>: Luminance of gray level 63

L<sub>0</sub>: Luminance of gray level 0

CR = CR (10)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note 5.

Note 2: Definition of Response Time (TR, TF):



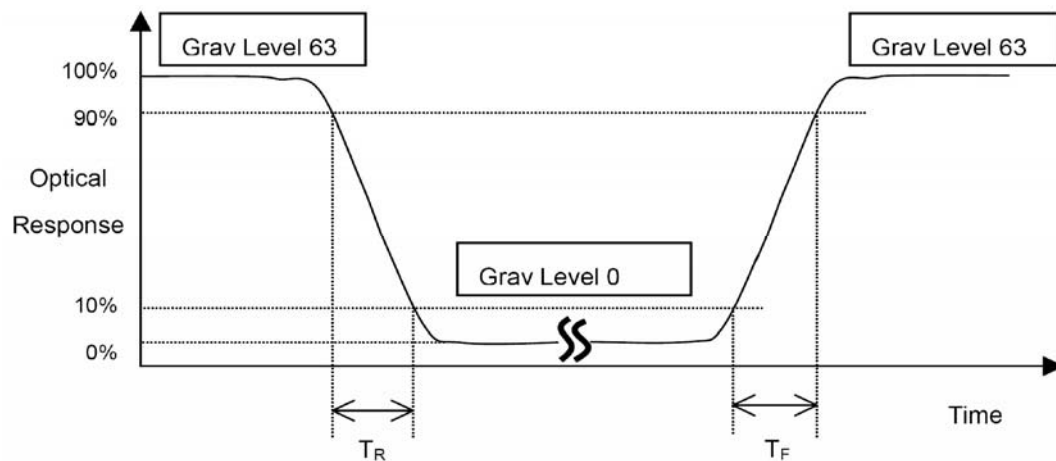


Figure 3

## Note 3: Viewing Angle

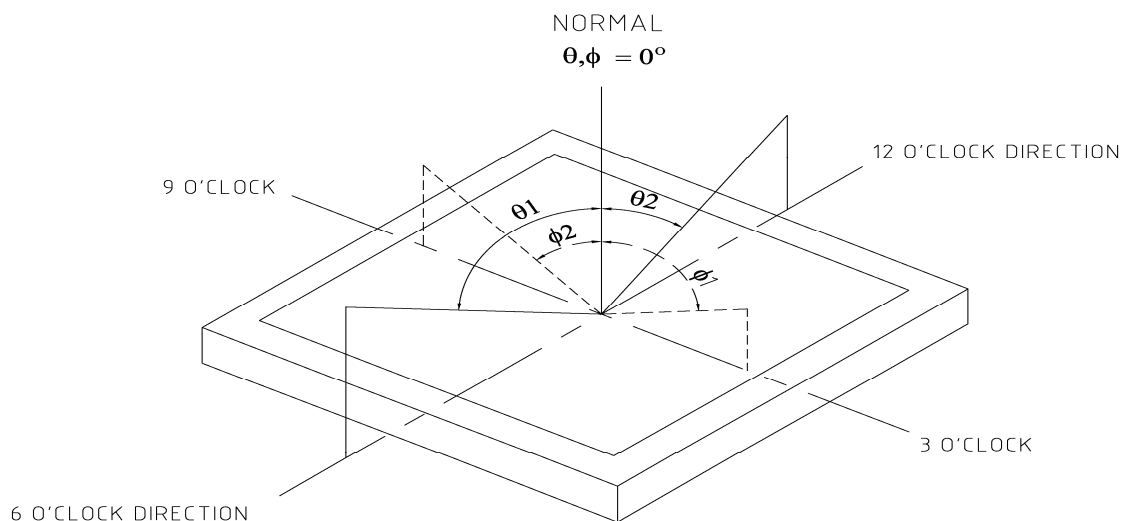


Figure 4

The above “Viewing Angle” is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 6 O’clock. Module maker can increase the “Viewing Angle” by applying Wide View Film.

## Note 4: Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement

should be executed after lighting Backlight for 20 minutes in a windless room.

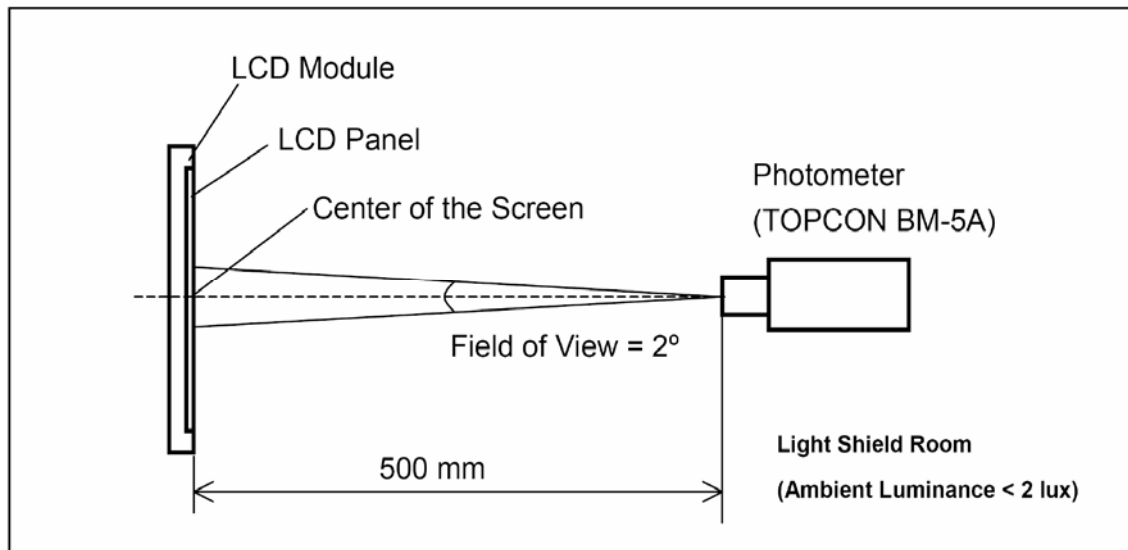


Figure 5

Timing Characteristics

8.1 MIPI-DSI High speed mode

Parameter	Symbol	Parameter	Specification			Unit
			MIN	TYP	MAX	
High Speed mode						
DSI-CLK+/-	2xUI <sub>INST</sub>	Double UI instantaneous	4	-	25	ns
DSI-CLK+/-	UI <sub>INSTA</sub> , UI <sub>INSTB</sub>	UI instantaneous Halfe	2	-	12.5	ns
DSI-Dn+/-	t <sub>DS</sub>	Data to clock setup time	0.15	-	-	UI
DSI-Dn+/-	t <sub>DH</sub>	Data to clock hold time	0.15	-	-	UI
DSI-CLK+/-	t <sub>ORTCLK</sub>	Differential rise time for clock	150	-	0.3UI	ps
DSI-Dn+/-	t <sub>ORTDATA</sub>	Differential rise time for data	150	-	0.3UI	ps
DSI-CLK+/-	t <sub>OFTCLK</sub>	Differential fall time for clock	150	-	0.3UI	ps
DSI-Dn+/-	t <sub>OFTDATA</sub>	Differential fall time for data	150	-	0.3UI	ps

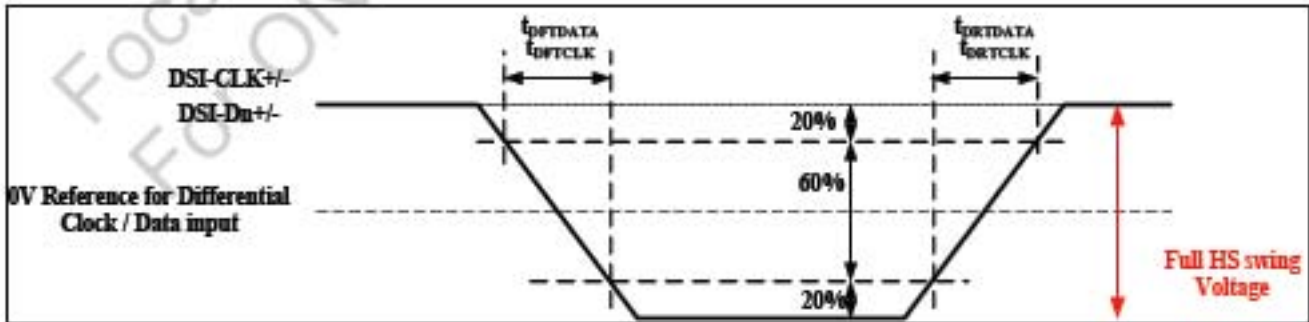
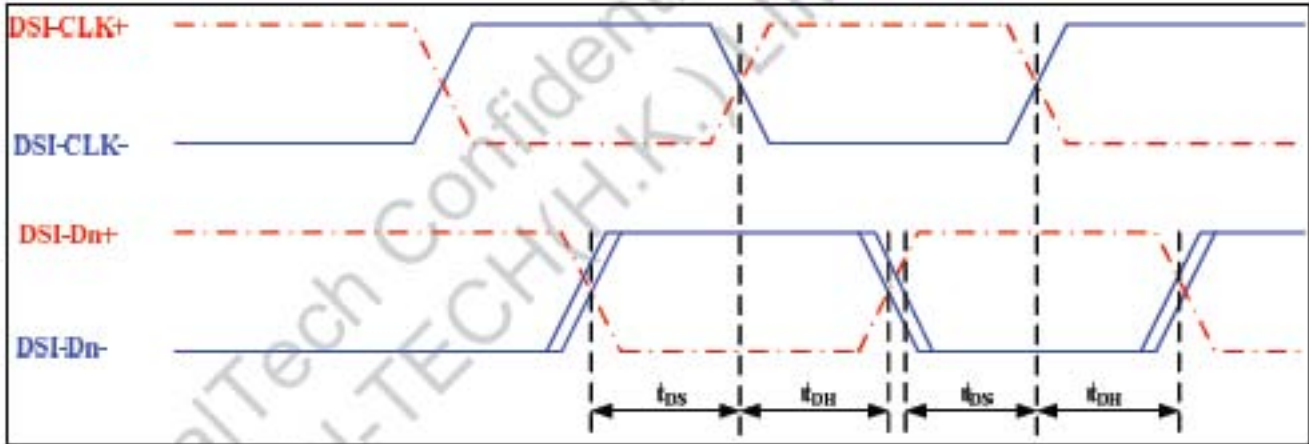
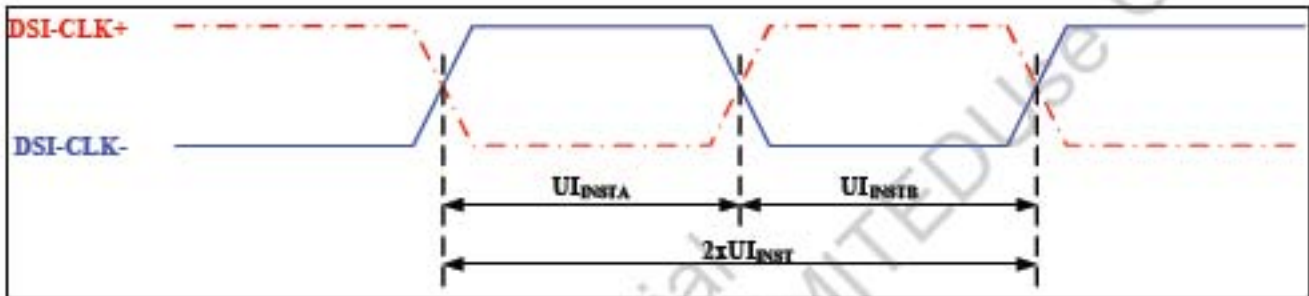


Figure 7. 80-system Bus Timing

8.2 Reset Operation of IC

Table 9: Reset Timing Characteristics (VCC = IOVCC=2.4~3.3V)

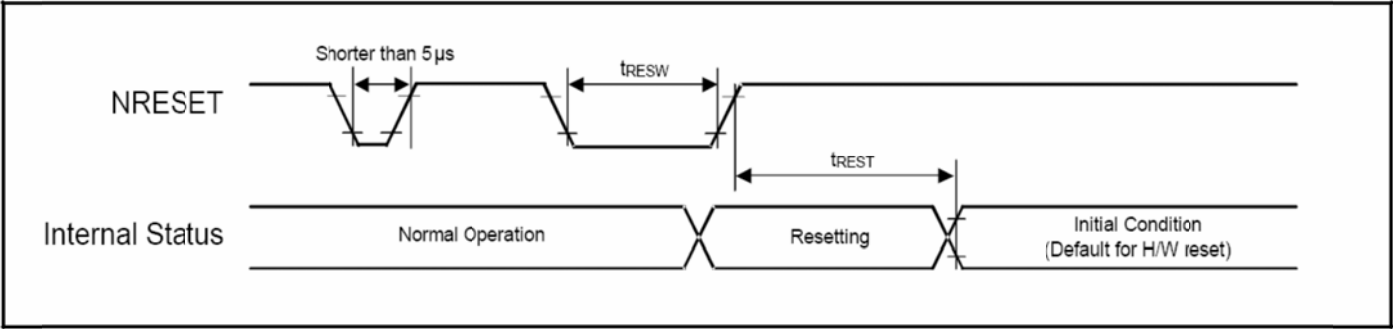


Figure 8: Reset Timing

## 9. Reliability Test Item

Test Item	Sample Type	Test Condition	Test result determinant gist
High temperature storage	Normal temperature	$60\pm 3^{\circ}\text{C}; 96\text{H}$	the inspection of appearance and function character.
	Wide temperature	$70\pm 3^{\circ}\text{C}; 96\text{H}$	
Low temperature storage	Normal temperature	$-20\pm 3^{\circ}\text{C}; 120\text{H}$	
	Wide temperature	$-30\pm 3^{\circ}\text{C}; 120\text{H}$	
High temperature /humidity storage	Normal temperature	$50^{\circ}\text{C}\pm 3^{\circ}\text{C}, 90\%\pm 3\%\text{RH}; 96\text{H}$	
	Wide temperature	$60^{\circ}\text{C}\pm 3^{\circ}\text{C}, 90\%\pm 3\%\text{RH}; 96\text{H}$	
High temperature operation	Normal temperature	$60\pm 3^{\circ}\text{C}; 96\text{H}$	No objection of the function character; no fatal objection of the appearance.
	Wide temperature	$70\pm 3^{\circ}\text{C}; 96\text{H}$	
Low temperature operation	Normal temperature	$0\pm 3^{\circ}\text{C}; 96\text{H}$	
	Wide temperature	$-20\pm 3^{\circ}\text{C}; 96\text{H}$	
High temperature /humidity operation	Normal temperature	$40^{\circ}\text{C}\pm 3^{\circ}\text{C}, 90\%\pm 3\%\text{RH}; 96\text{H}$	
	Wide temperature	$50^{\circ}\text{C}\pm 3^{\circ}\text{C}, 90\%\pm 3\%\text{RH}; 96\text{H}$	
Temperature Shock	Normal temperature	$-20\pm 3^{\circ}\text{C}, 30\text{min} \rightarrow 70\pm 3^{\circ}\text{C}, 30\text{min}; 10\text{cycle}$	inspect the objections appearance、function & the whole structure
	Wide temperature	$-30\pm 3^{\circ}\text{C}, 30\text{min}$ $80\pm 3, 30\text{min}; 10\text{cycle}$	The inspection of appearance、function & the whole structure

## 10. Suggestions for using LCD modules

### 10.1 Handling of LCM

1. The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.
2. If the LCD screen is damaged and the liquid crystal leaks out, do not lick and swallow. When the liquid is attach to your hand, skin, cloth etc, wash it off by using soap and water thoroughly and immediately.
3. Don't apply excessive force on the surface of the LCM.
4. If the surface is contaminated ,clean it with soft cloth. If the LCM is severely contaminated , use Isopropyl alcohol/Ethyl alcohol to clean. Other solvents may damage the polarizer . The following solvents is especially prohibited: water , ketone Aromatic solvents etc.
5. 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.
6. 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. Don't disassemble the LCM.
8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  - Be sure to ground the body when handling the LCD modules.
  - Tools required for assembling, such as soldering irons, must be properly grounded.
  - To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
  - 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.
9. Do not alter, modify or change the the shape of the tab on the metal frame.
10. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

11. Do not damage or modify the pattern writing on the printed circuit board.
12. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector
13. Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
14. Do not drop, bend or twist LCM.

## 10.2 Storage

1. Store in an ambient temperature of 5 to 45 °C, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
2. Storage in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.

## 11. Packing (Reference only)

### Packing Method

(1)

Use empty tray

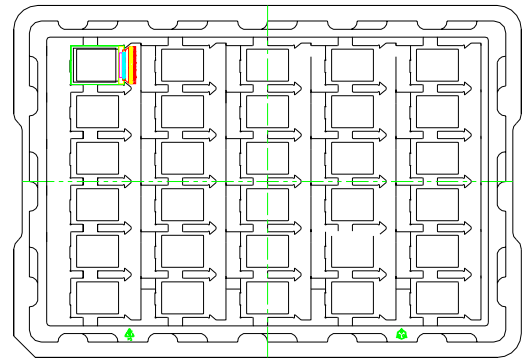


Put products into the tray

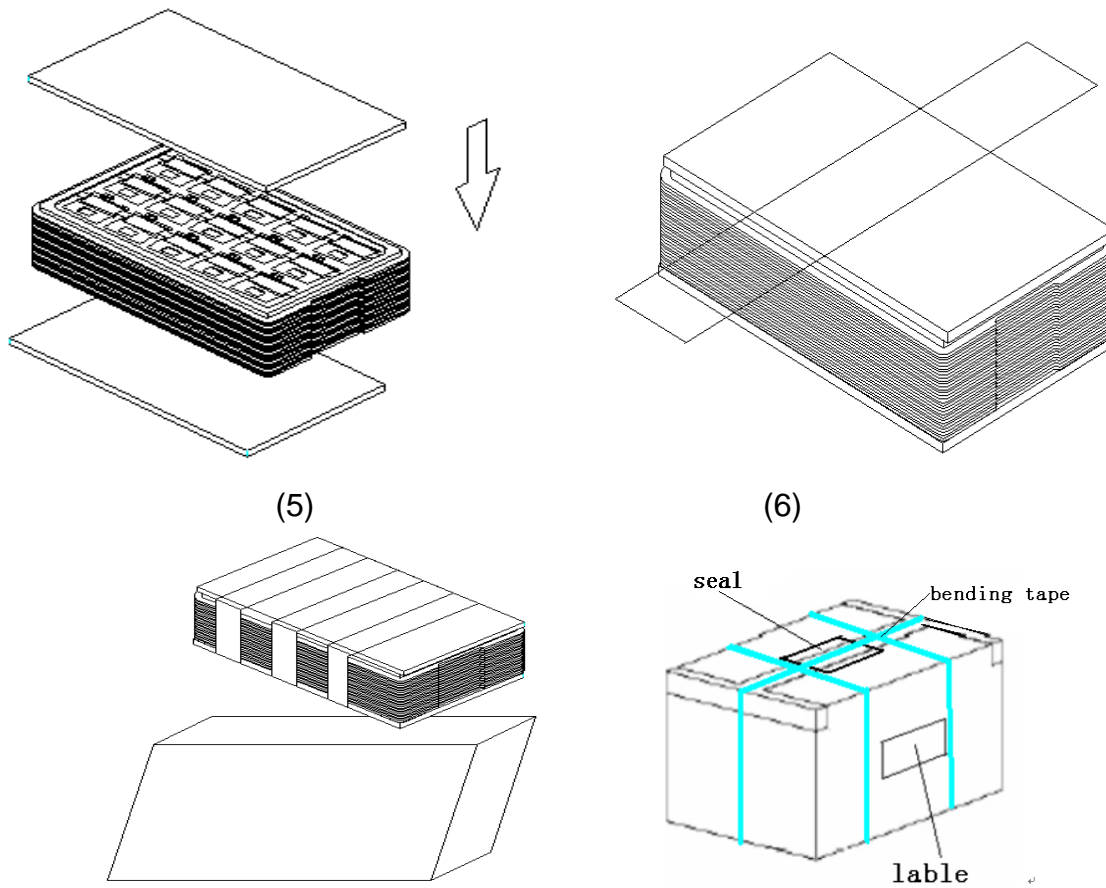


(3)

(2)



(4)



1. Put module into tray cavity:
2. Tray stacking
3. Put 1 cardboard under the tray stack and 1 cardboard 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.

- END -