东莞奇创力显示器有限公司

Kitronix (Dong guan) Ltd.

FOR APPROVAL

样 品 承 认 书

WE ARE PLEASED IN SENDDING YOU HEREWITH OUR SPECIFICATION AND DRAWING FOR YOUR APPROVAL. PLEASE RETURN TO US ONE COPY OF "FOR APPOVAL" WITH YOUR APPROVED SIGNATURES.

YOUR MODULE NO.: _____   OUR MODULE NO.:   K283QVB-V46-F

YOUR SPEC NO.: _____   OUR FULL SPEC NO.:   FS-K283QVB-V46-F-01

APPROVED BY		

APPROVED BY CUSTOMER

Kitronix (Dong Guan) Ltd.
No. A20, Luyi Road, Tianxin Country, Tangxia Town, Dongguan City, Guangdong Province.

Kitronix (Dong guan) Ltd.
PRODUCT SPECIFICATION

K283QVB-V46-F

Product

Standard LCD Module
240 x RGB x 320 Dots
2.83"   TFT LCD
Wide temperature
With white color LED backlight
With Touch Panel

Kitronix (Dong Guan) Ltd.

No. A20, Luyi Road, Tianxin Country, Tangxia Town, Dongguan City, Guangdong Province.

CONTENTS

Kitronix (Dong guan) Ltd.
PRODUCT SPECIFICATION

1. Document revision history :

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
01	2009.02.25	First Release.	Van Ng	

2. General Description

- 2.83"(diagonal), 240 x RGB x 320 dots, 262k colors, Transmissive, TFT LCD module.
- Viewing Direction: 12 o'clock.
- Driving IC: SSD1297 or equivalent TFT controller/driver.
- 16-bits data bus (I80 system interface).
- Logic voltage: 2.8V (typ.).
- Touch panel.

3. Mechanical Specifications

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

Table 1

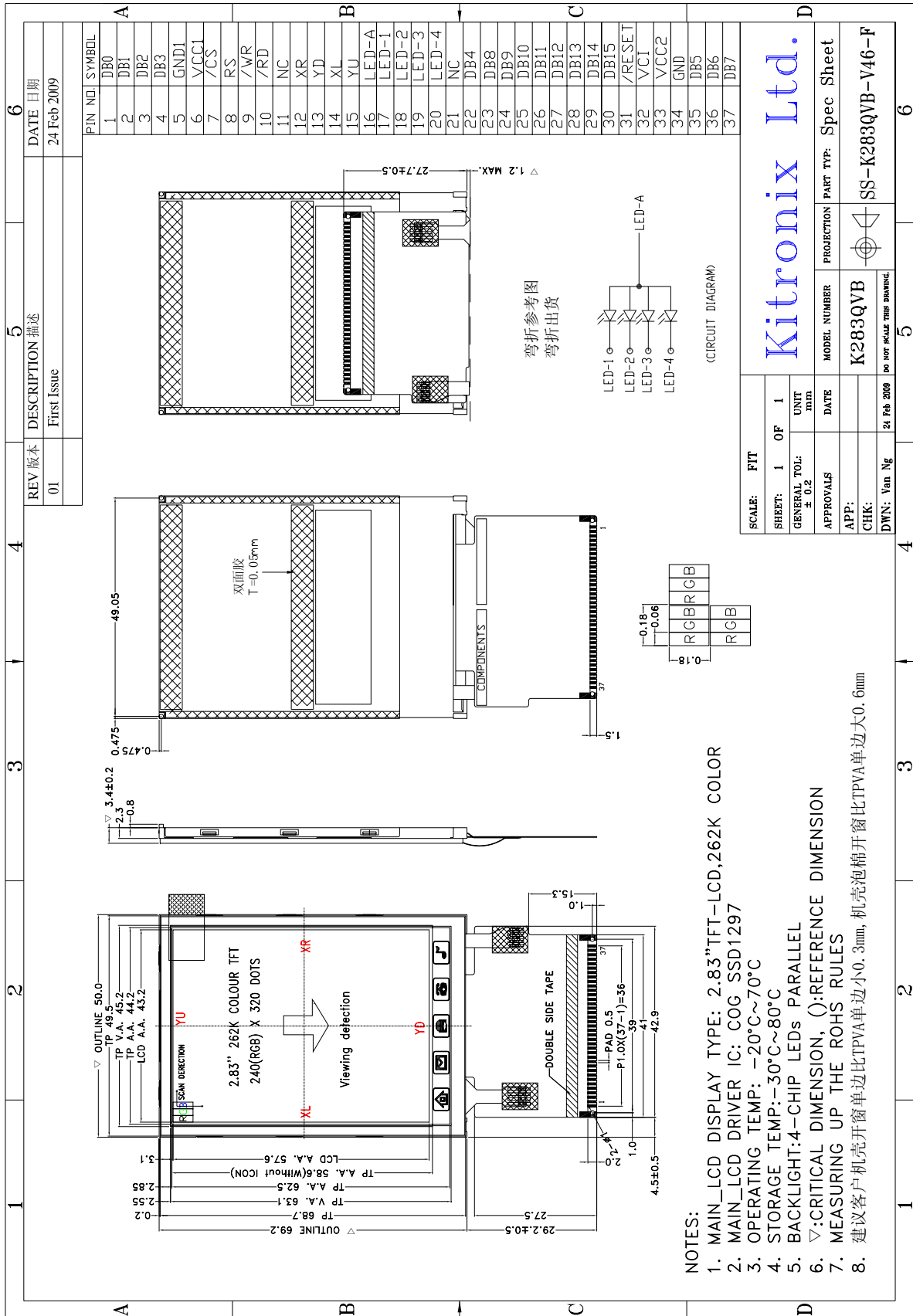| Parameter		Specifications	Unit
Outline dimensions		50.0(W) x 69.2(H) x 3.4(D) (Exclude FPC, cables of touch panel and backlight)	mm
Color TFT 240xRGBx320	View area	45.2(W) x 63.1 (H)	mm
	TP active area	44.2(W) x 62.5(H)	mm
	LCD active area	43.2(W) x 57.6(H)	mm
	Display format	240 x RGB x 320	dots
	Color configuration	RGB stripes	-
	Dot pitch	0.180(RGB)(W) x 0.180(H)	mm
Weight		TBD	grams

Figure 1: Outline Drawing

NOTES:
1. MAIN_LCD DISPLAY TYPE: 2.83"TFT-LCD,262K COLOR
2. MAIN_LCD DRIVER IC: COG SSD1297
3. OPERATING TEMP: -20°C~70°C
4. STORAGE TEMP:-30°C~80°C
5. BACKLIGHT:4-CHIP LEDs PARALLEL
6. ▽:CRITICAL DIMENSION, ( ):REFERENCE DIMENSION
7. MEASURING UP THE ROHS RULES
8. 建议客户机壳开窗边比TPVA单边小0.3mm, 机壳泡棉开窗比TPVA单边大0.6mm

PIN NO	SYMBOL
1	DB0
2	DB1
3	DB2
4	DB3
5	GND1
6	VCC1
7	/CS
8	RS
9	/WR
10	/RD
11	NC
12	XR
13	YD
14	XL
15	YU
16	LED-A
17	LED-1
18	LED-2
19	LED-3
20	LED-4
21	NC
22	DB4
23	DB8
24	DB9
25	DB10
26	DB11
27	DB12
28	DB13
29	DB14
30	DB15
31	/RESET
32	VCI
33	VCC2
34	GND
35	DB5
36	DB6
37	DB7

(CIRCUIT DIAGRAM)

DATE 日期 24 Feb 2009

REV 版本 DESCRIPTION 描述 First Issue 01

Kitronix Ltd.

PART TYP: Spec Sheet
PROJECTION
MODEL NUMBER K283QVB
SS-K283QVB-V46-F
SCALE: FIT
SHEET: 1 OF 1
GENERAL TOL.: ± 0.2
UNIT mm
APPROVALS DATE 24 Feb 2009
APP:
CHK:
DWN: Van Ng
DO NOT SCALE THIS DRAWING.

2.83'' 262K COLOUR TFT
240(RGB) X 320 DOTS

Viewing deflection

DOUBLE SIDE TAPE

4. Interface signals

Table 2: Pin assignment

Pin No.	Symbol	Description
1-4	[DB0-DB3]	16-bit bi-directional data bus.
5	GND1	Ground for the logic and analog circuit.
6	VCC1	A power supply for the internal logic circuit and for the I/O circuit. VCC = 2.2 ~ 3.3V.
7	/CS	Chip select signal. 0: chip can be accessed; 1: chip cannot be accessed.
8	RS	Register Select Signal (H: Data, L: Instruction)
9	/WR	I80 system: Serves as a write signal and writes data at the rising edge.
10	/RD	I80 system: Serves as a read signal and reads data at the low level.
11	NC	NC
12	XR	Terminal of touch panel.
13	YD	
14	XL	
15	YU	
16	LEDA	Anode of LED backlight.
17	LEDK1	Cathode of LED backlight.
18	LEDK2	
19	LEDK3	
20	LEDK4	
21	NC	NC
22	DB4	16-bit bi-directional data bus.
23-30	[DB8-DB15]	
31	/RESET	Reset pin. Setting either pin low initializes the LSI. Must be reset the chip after power being supplied.
32	VCI	A power supply for the internal logic circuit and for the I/O circuit. VCC = 2.2 ~ 3.3V.
33	VCC2	
34	GND	Ground for the logic and analog circuit.
35-37	[DB5-DB7]	16-bit bi-directional data bus.

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 (VCC)	VCC	-0.3	+4.0	V	1

Note:

1.VCC, GND must be maintained.

2.The modules may be destroyed if they are used beyond the absolute maximum ratings.

5.2 Environmental Condition

Table 4

Item	Operating temperature (Topr)		Storage temperature (Tstg) (Note 1)		Remark
	Min.	Max.	Min.	Max.	
Ambient temperature	-20°C	+70°C	-30°C	+80°C	Dry
Humidity (Note 1)	80% max. RH for Ta $\leq$ 40°C < 50% RH for 40°C < Ta $\leq$ Maximum operating temperature				No condensation

Note 1: Product cannot sustain at extreme storage conditions for long time.

6. Electrical Specifications

Typical Electrical Characteristics

At Ta = 25 °C, VCC=IOVCC= 2.4V to 3.3V, GND=0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (logic)	VCC-GND		2.6	2.8	3.3	V
Supply current (Logic & LCD)	ICC	VCC=2.8V	-	-	10	mA
Supply voltage of white LED backlight	VLED =V($_{BL+}$)- V($_{BL-}$)	Forward current =60 mA Number of LED dies = 4	2.9	3.2	3.5	V
Luminance (on the module surface)			-	150	-	cd/m^2

7. Optical Characteristics

Table 7: Optical specifications

Items		Symbol	Condition	Specifications Min.	Specifications Typ.	Specifications Max.	Unit	
Contrast Ratio		CR		-	350	-	-	
Response Time		T_R		-	15	20	ms	
		T_F		-	35	50	ms	
Chromaticity	Red	X_R		0.600	0.620	0.640	-	Note
		Y_R		0.310	0.330	0.350	-	
	Green	X_G		0.283	0.303	0.323	-	
		Y_G		0.570	0.590	0.610	-	
	Blue	X_B		0.115	0.135	0.155	-	
		Y_B		0.100	0.120	0.140	-	
	White	X_W		0.288	0.308	0.328	-	
		Y_W		0.310	0.330	0.350	-	
Viewing angle	Hor.	$\phi1$(3 o'clock)	Center CR≥10	-	45	-	deg.	
		$\phi2$(9 o'clock)		-	45	-		
	Ver.	$\theta2$(12 o'clock)		-	35	-		
		$\theta1$(6 o'clock)		-	15	-		
NTSC ratio					60.0		%	

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63

L0: 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

Kitronix (Dong guan) Ltd.
PRODUCT SPECIFICATION

FS-K283QVB-V46-F

25/Feb/2009

PAGE 9 OF 22

www.DataSheet4U.com
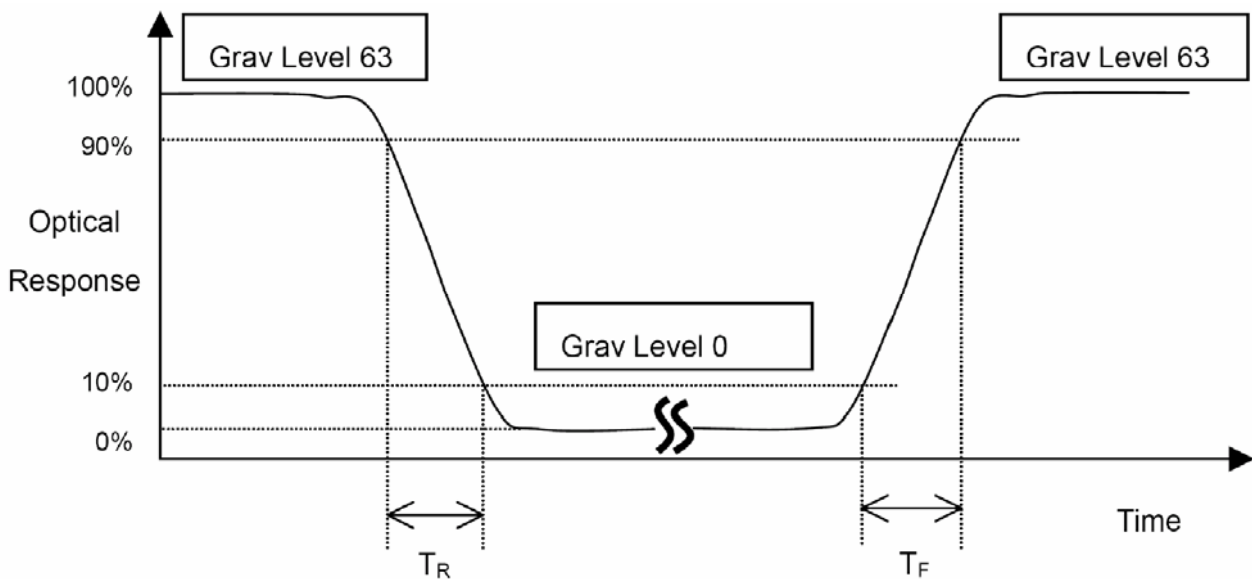
Note 3: Viewing Angle
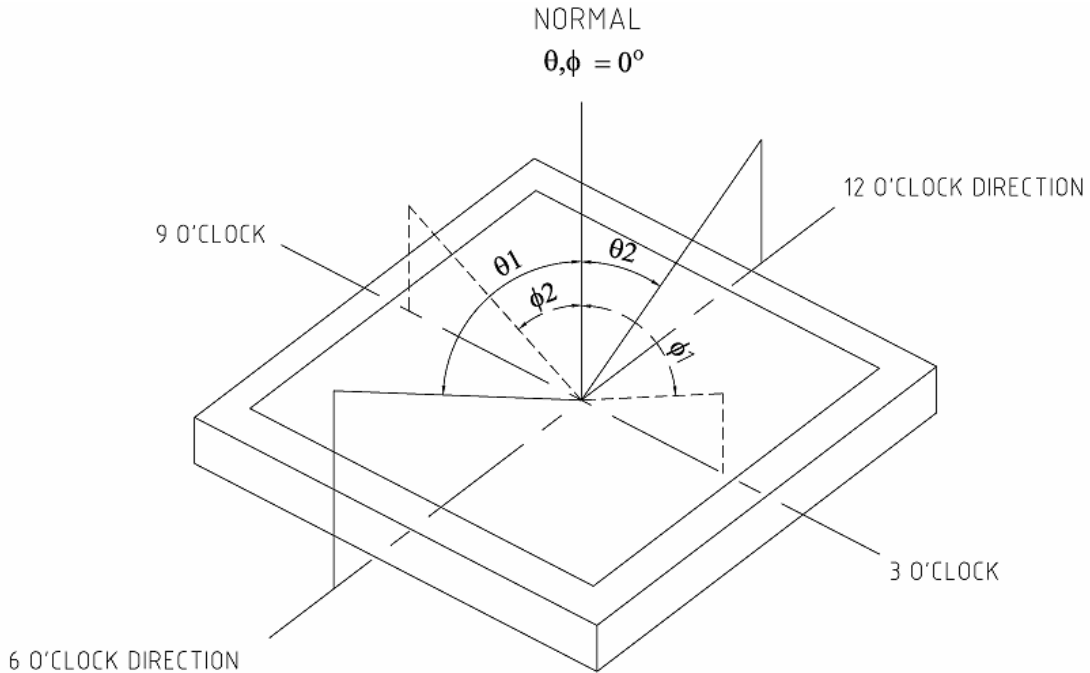
Figure 4

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

Kitronix (Dong guan) Ltd.
PRODUCT SPECIFICATION
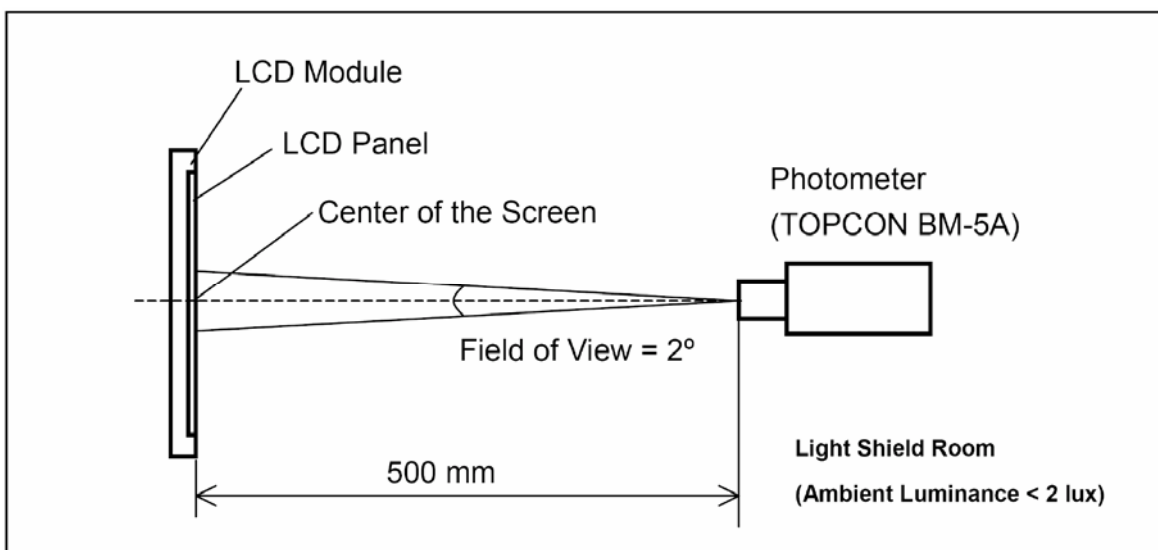
8. Timing Characteristics

8.1 80-system Bus Interface Timing Characteristics of IC

<u>Table 8: Normal Write Mode (VCC = IOVCC=2.4~3.3V)</u>

Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time (write cycle)	100	-	-	ns
t_{cycle}	Clock Cycle Time (read cycle)	1000	-	-	ns
t_{AS}	Address Setup Time	0	-	-	ns
t_{AH}	Address Hold Time	0	-	-	ns
t_{DSW}	Data Setup Time	5	-	-	ns
t_{DHW}	Data Hold Time	5	-	-	ns
t_{ACC}	Data Access Time	250	-	-	ns
t_{OH}	Output Hold time	100	-	-	ns
$PWCS_L$	Pulse Width /CS low (write cycle)	50	-	-	ns
$PWCS_H$	Pulse Width /CS high (write cycle)	50	-	-	ns
$PWCS_L$	Pulse Width /CS low (read cycle)	500	-	-	ns
$PWCS_H$	Pulse Width /CS high (read cycle)	500	-	-	ns
t_R	Rise time	-	-	4	ns
t_F	Fall time	-	-	4	ns

Write Cycle
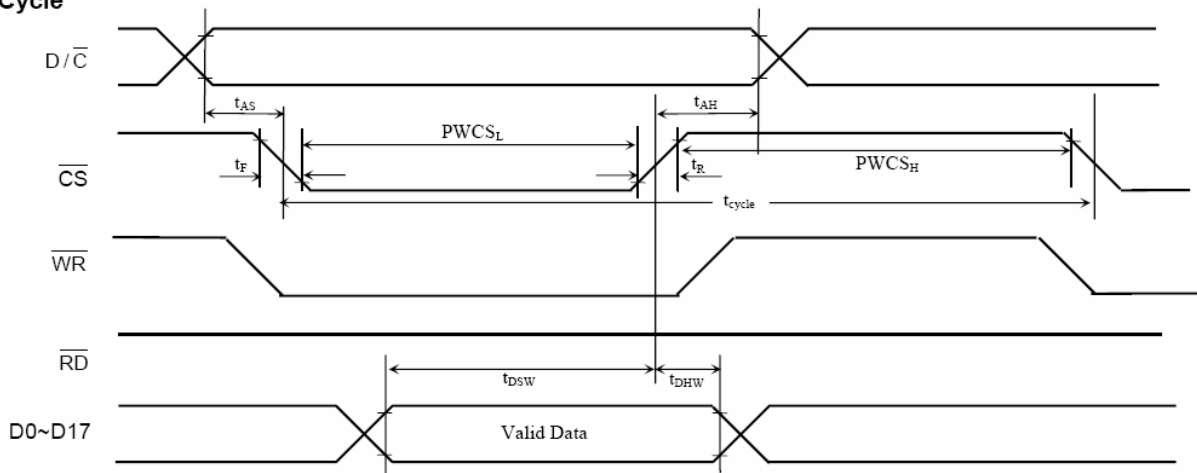
Read Cycle
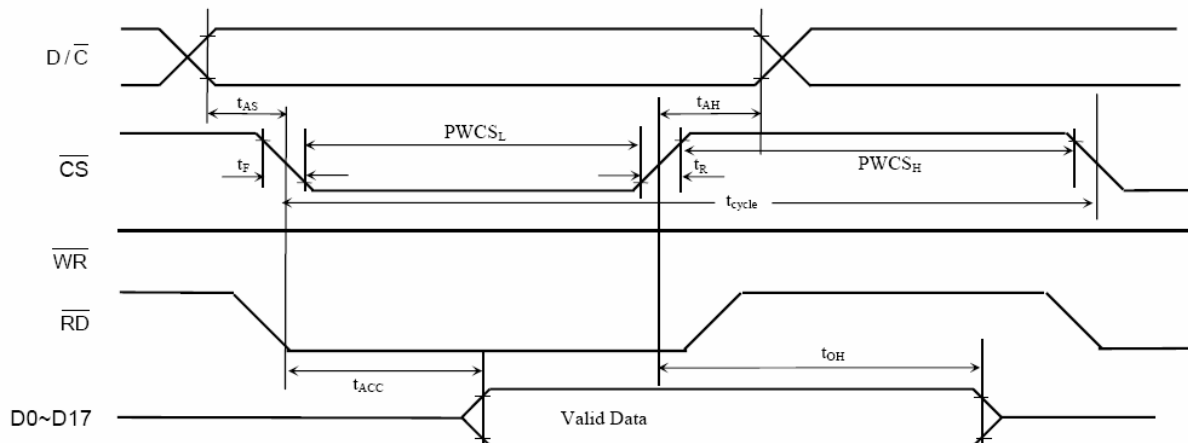
Figure 7. 80-system Bus Timing

8.2 Reset Operation of IC

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

Item	Symbol	Unit	Min.	Typ.	Max.
Reset low-level width	tRES	ms	1	-	-
Reset rise time	trRES	μS	-	-	10
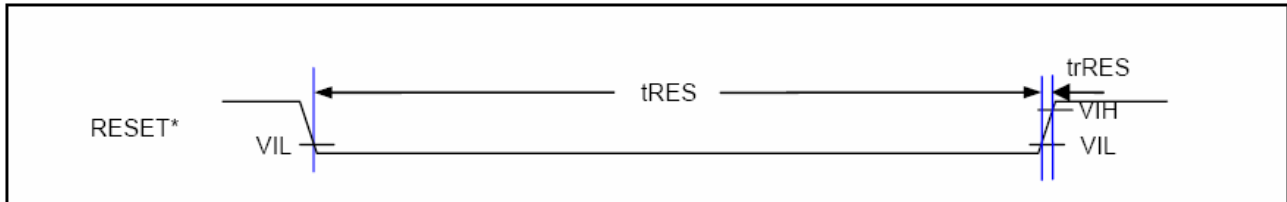
Figure 8: Reset Timing

9. Reliability Test Item

Test Item	Sample Type	Test Condition	Test result determinant gist
High temperature storage	Normal temperature	70±3℃;96H	the inspection of appearance and function character.
	Wide temperature	80±3℃;96H	
Low temperature storage	Normal temperature	-20±3℃;120H	
	Wide temperature	-30±3℃;120H	
High temperature /humidity storage	Normal temperature	50℃±3℃,90%±3%RH;96H	
	Wide temperature	60℃±3℃,90%±3%RH;96H	
High temperature operation	Normal temperature	60±3℃;96H	no objection of the function character; no fatal objection of the appearance.
	Wide temperature	70±3℃;96H	
Low temperature operation	Normal temperature	0±3℃;96H	
	Wide temperature	-20±3℃;96H	
High temperature /humidity operation	Normal temperature	40℃±3℃,90%±3%RH;96H	
	Wide temperature	50℃±3℃,90%±3%RH;96H	
Temperature Shock	Normal temperature	-20±3℃,30min→70±3℃,30 min;10cycle	inspect the objections appearance、 function & the whole structure
	Wide temperature	-30±3℃,30min 80±3,30min;10cycle	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 Cautions for installing and assemabling if the module has Touch Panel

1. Use a buffer material (Gasket) between the touch panel and Front-case to protect damage and wrong operating. The dimension of the buffer material's edge between the TP V.A. edge is Min. 0.3mm.

2. We recommend to design a case that it can't over the boundary of the active area Max. 0.5mm in order to prevent an operation at outside of the active area which can't guarantee the specified durability, because operation at the outside of the active area cause serious damage of a transparent.

3. When design case for installing Module, you would consider give a distance about 0.2 ± 0.15mm between the module edge to case inside.

4. The corners of the product are not chamfered. When positioning and fixing the product on the case, we sugguest that you would provide a R part on the conner of the case so as not to apply load on the corner of the transparent module.
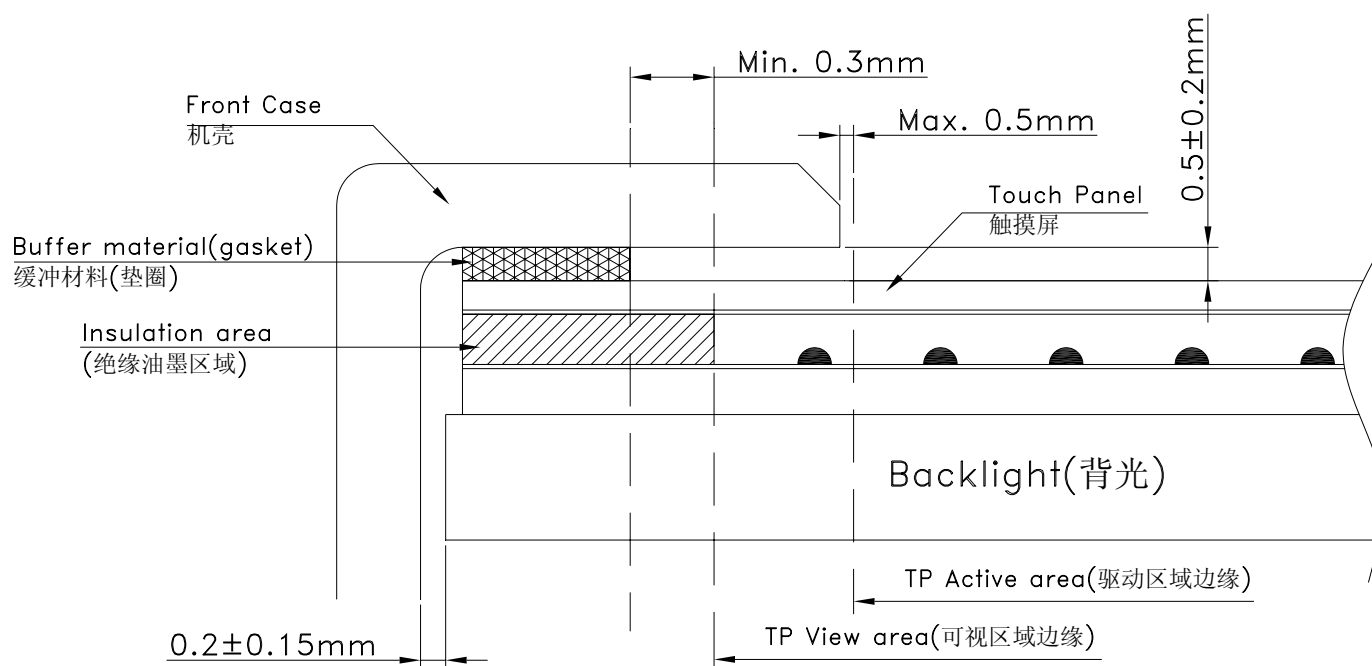
10.3 Storage

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. Inspection Standard

This specification is made to be used as the standard acceptance/rejection criteria for Color mobile phone LCM with touch pannel.

11.1 Sample plan and Inspection condition

11.1.1 Sample plan

Sampling plan according to MIL-STD-105E , normal level 2 and based on:

Major defect: AQL 0.65;

Minor defect: AQL 1.5.

11.1.2 Inspection condition

Viewing distance for cosmetic inspection is about 30cm with bare eyes, and under an environment of 20~40W light intensity, all directions for inspecting the sample should be within 45 against perpendicular line.

11.2 Definition of inspection zone in LCD
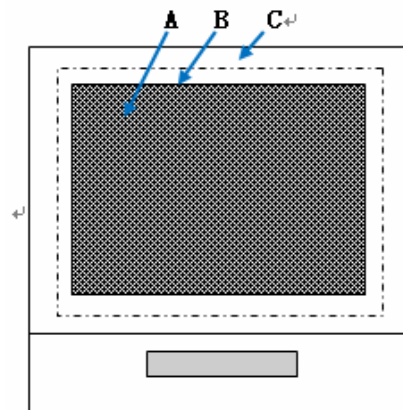
Inspection zones in an LCD

Zone A: character/Digit area;

Zone B: viewing area except Zone A (ZoneA+ZoneB=minimum Viewing area);

Zone C: Outside viewing area (invisible area after assembly in customer's product);

Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble for quality and assembly of customer's product. Defects are classified as major defects and minor defects according to the degree of defectiveness defined herein.

11.3 Major defects and Minor defects

11.3.1 Major defects

A major defect is a defect that is likely to result in failure, or to reduce the usability of the product for its intended purpose.

11.3.1.1 Abnormal operation: modules cannot display normally;

11.3.1.2 Line defect;

11.3.1.3 There is serious distortion or sharp burr on mechanical housing;

11.3.1.4 Glass breakage.

11.3.2 Minor defects:

  A minor defect is a defect that is not likely to reduce the usability of the product for its intended purpose.

11.3.2.1 Dot defect:

  11.3.2.1.1 Inspection pattern : Full white, full black, red, green and blue screens;

  11.3.2.1.2 Criteria :(acceptable);

Sub-pixel
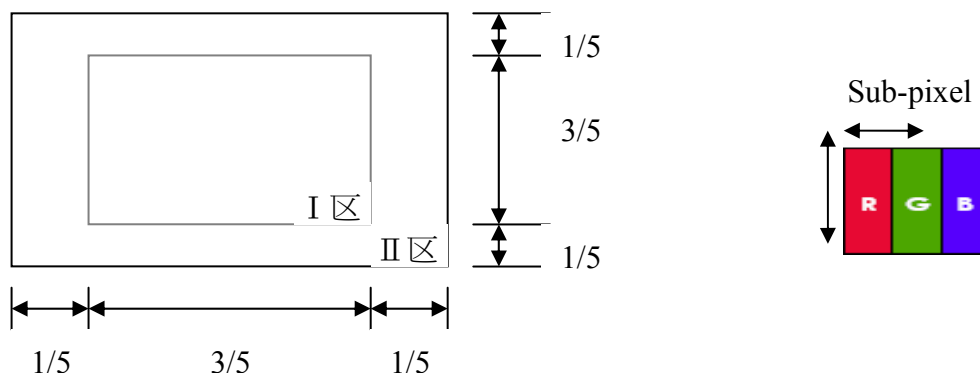
  Note: 1. Dot defect is defined as the defective area of the dot area is larger than 50% of the dot area . And the bright dot defect must be visible through 5% ND filter.

      2. Except for the allowed numbers of adjacent dots, the distance between dot defects should be more than 3mm apart.

  11.3.2.1.3 The definitions of the inner display area and outer display area.

11.4 Inspection standards table:

11.4.1 Major defect
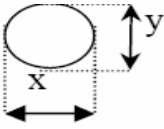
Item No.	Items to be	Inspection Standard	Classification of defects
11.4.1.1	All functional defects	1) No display 2) Display abnormally 3) Missing vertical/horizontal segment 4) Short circuit 5) Back-light no lighting, flickering and abnormal lighting.	Major
11.4.1.2	Missing	Missing component	
11.4.1.3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.	
11.4.1.4	linearity	No more than 1.5%	

11.4.2 Cosmetic Defect (spot defect)

Item No	Items to be	Inspection Standard					Classification of defects
11.4.2.1	**Clear Spots** Black and white Spot defect Pinhole, Foreign Particle, polarizer Dirt	For dark/white spot, size Φ is defined as Φ=(x +y)/2					Minor
		Zone Size(mm)	Acceptable Qty				Minor
			A	B	C		
		Φ≤0.1	Ignore		Ignore		
		0.10＜Φ≤0.15	2				
		0.15＜Φ≤0.20	1				
		Φ＞0.20	0				
11.4.2.2	**Clear Spots** TP Dirt	Zone Size(mm)	Acceptable Qty				Minor
			A	B	C		
		Φ≤0.1	Ignore		Ignore		
		0.10＜Φ≤0.15	2				
		0.15＜Φ≤0.25	1				
		Φ＞0.25	0				
11.4.2.3	**Dim Spots** Circle shaped and dim edged defects	Zone Size(mm)	Acceptable Qty				Minor
			A	B	C		
		Φ≤0.2	Ignore		Ignore		
		0.20＜Φ≤0.4	2				
		0.4＜Φ≤0.6	1				
		Φ＞0.6	0				
11.4.2.4	**Dot defect**	dot =sub-pixel					Minor
			Acceptable Qty				
			I	II			
		Bright dot	0	2			
		Dark dot	1	2			
		The distance of two point ＞5mm					

11.4.3 Cosmetic Defect (linear defect)

Item No	Items to be	Inspection Standard						Classification of defects
11.4.3.1	**Line defect** Black line, White line, Foreign material on polarizer	Size(mm)		Acceptable Qty				Minor
		L(Length)	W(Width)	zone				
				A	B	C		
		Ignore	W≤0.02	Ignore		Ignore		
		L≤3.0	0.02＜W≤0.03	2				
		L≤2.0	0.03＜W≤0.05	1				
			W＞0.05	Define as spot defect				

11.4.3.2	Foreign Material on TP film	The line can be seen after mobile phone in the operating condition:						Minor

The line can be seen after mobile phone in the operating condition:

Size(mm)		Acceptable Qty		
L(Length)	W(Width)	zone		
		A	B	C
Ignore	W≤0.03	Ignore		Ignore
L≤3.0	0.03＜W≤0.05	3		
	W＞0.05	Define as spot defect		

11.4.3.3 Dim line defect Polarizer &BL scratch TP film scratch — Minor

If the scratch can be seen after mobile phone cover assembling or in the operating condition, judge by the line defect of 11.4.3.1. If the scratch can be seen only in non-operating condition or some special angle, judge by the following.

Size(mm)		Acceptable Qty		
L(Length)	W(Width)	zone		
		A	B	C
Ignore	W≤0.02	Ignore		Ignore
L≤3.0	0.02＜W≤0.03	2		
L≤2.0	0.03＜W≤0.05	1		
	W＞0.05	Define as spot defect		

11.4.3.4 Polarize Air bubble — Minor

Air bubbles between glass & polarizer

	Acceptable Qty		
	A	B	C
Φ≤0.2	Ignore		Ignore
0.20＜Φ≤0.3	2		
0.3＜Φ≤0.5	1		
Φ＞0.5	0		

11.4.4 Chipping Defect

Item No	Items to be	Inspection Standard	Classification of defects
11.4.4.1	Glass defect	Chips on corner **A:LCD Glass defect** Notes: S=contact pad length Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal. **B:TP Glass defect** 	Minor

X	Y	Z
≤0.2	≤S	Disregard

X	Y	Z
≤3.0	≤3.0	Disregard

Usual surface cracks

A:LCD Glass defect
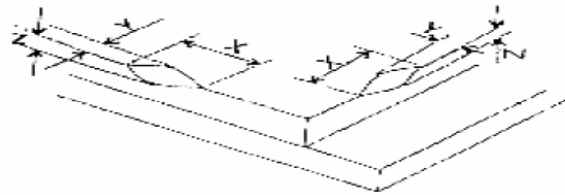
X	Y	Z
≤3.0	<Inner border line of the seal	Disregard

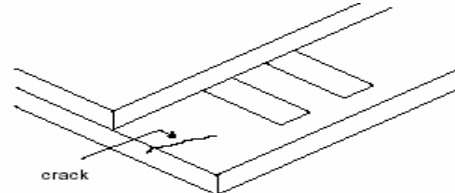**B:TP Glass defect**
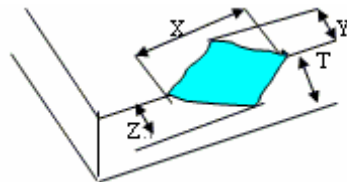
X	Y	Z
≤6.0	≤2.0	Disregard

Crack: Cracks tend to break are not allowed.

11.4.5 Parts Defect

| Item No	Items to be	Inspection Standard	Classification of defects
11.4.5.1	Parts contra position	1、Not allow IC and FPC/heat-seal lead width is more than 50% beyond lead pattern. 2、Not allow chip or solder component is off center more than 50% of the pad outline.	Major
11.4.5.2	SMT	According to the <Acceptability of electronic assemblies>IPC-A-610C class 2 standard. Component missing or function defect are Major defect, the others are Minor defect.	Major
11.4.5.3	TP Defect	1、 Pattern font： Pattern fonts are clear and symmetrical， pattern fonts filter lightly are allowed; The fort line is not allow to thinner or thicker than 1/3 of normal size, and swing is not more than 0.1mm. the line is smooth and not broken. 图案字体　Pattern font 2、The wing forward in the side of Visual Area： The length of wing forward inside of the Visual Area: n≤0.2mm；Not excess 3 point，and the distance D≥20mm。	Major
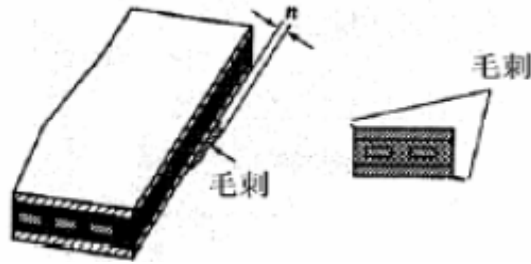
3、Film impression: With operation, must be invisibility.
4、Touch panel knob：if writing function normally, it could be allowed.

TP鼓　　TP knob

5、 Newton ring
Without operation, the color circle of Regularity or
Non-regularity from the normal or slope angle of view.
1、Regularity： The area of the newton ring is less than 1/3 area of the touch panel; and no character affected and line distorted after touch panel lightening. It's ok.
2、 Non-regularity ： The area of the Newton ring is less than the 1/2 area of touch panel with lightening. And no character affected and line


规律形　　　　非规律形

11.4.5.4	Backlight elements	1 Illumination source flickers when lit. 2 Spots or scratches that appear when lit must be judged using LCD spot, lines and contamination standards. 3 Backlight doesn't light or color is wrong	Major
11.4.5.5	Soldering	1 No unmelted solder paste may be present on the FPC 2 No cold solder joints, missing solder connections, oxidation or icicle. 3 No short circuits in components on FPC	Major

12. Packing (Reference only)

Packing Method

(1)

(2)

(3)

(4)

(5)

(6)
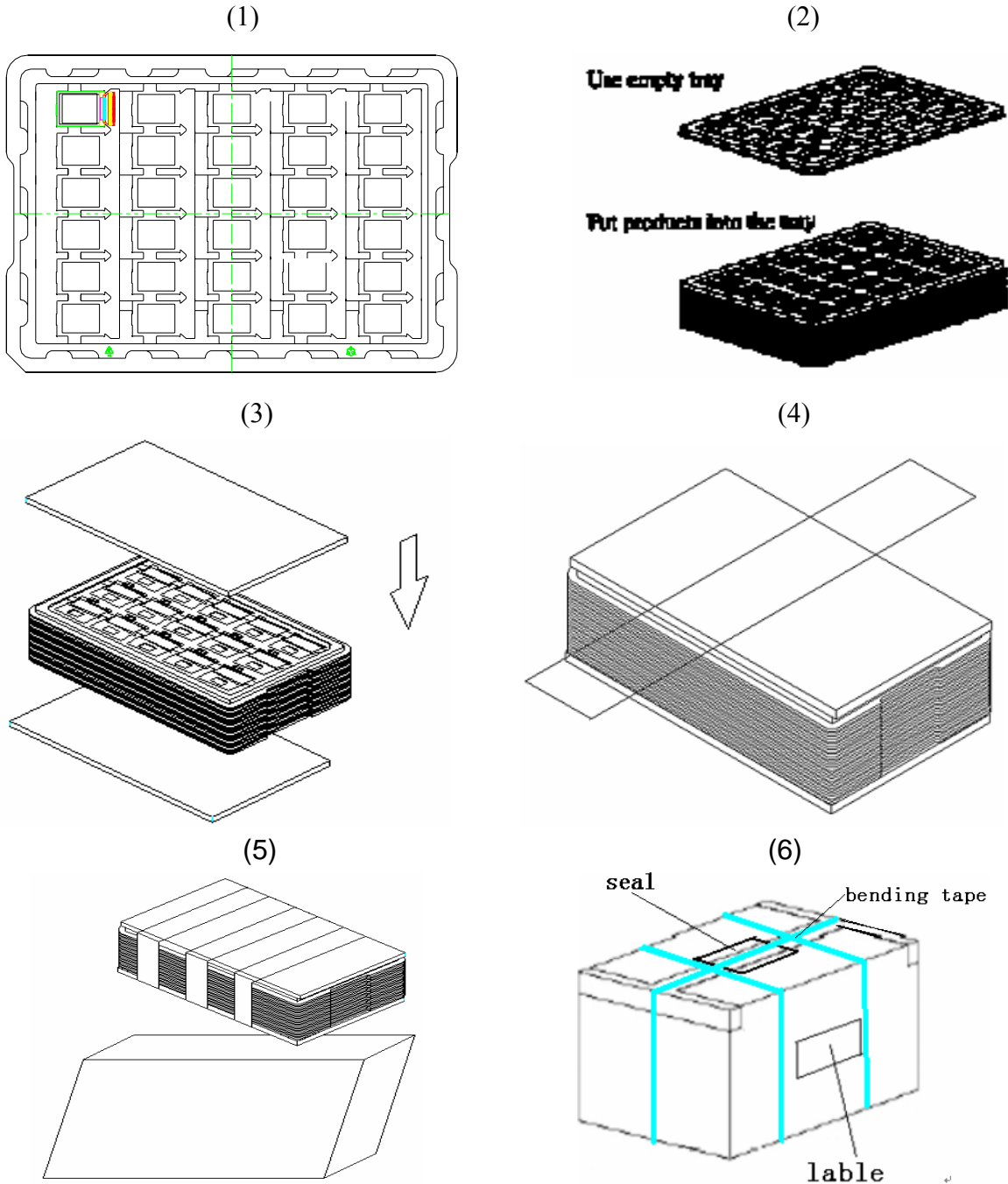
1. Put module into tray cavity :

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 -