INTELTRONIC

5.0 inch TFT LCD
Without Touch Panel
SPECIFICATION

MODEL NAME: LMMDF050CXN1

Date: 2019/04/18

Customer Signature		
Customer		
Approved Date	Approved By	Reviewed By

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1 Document revision history :

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
A	2019.04.18	First Release.		

2. General Description

- 5.0"(diagonal), 720 x3 RGB x 1280 dots, 16.7M colors, TFT LCD module.
- Viewing Direction: ALL.
- Driving IC: ILI9881D
- 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		67.16*120.60	mm
Color TFT 240xRGBx320	TP view area	-	mm
	TP active area	-	mm
	LCD active area	62.10*(W) x 110.40(H)	mm
	Display format	720 x3 RGB x 1280	dots
	Color configuration	RGB Vertical stripe	-
	Dot pitch	0.02875*3(W) (RGB) x 0.08625(H)	mm
Weight		TBD	grams

NOTES:
1.DISPLAY MODE:16.7M Color TFT,Transmissive,Normally Black Mode
2.MODULE LUMINANCE(WITH CTP):290cd/m2(MIN)
3.OPERATING TEMPERATURE:-20°C TO 60°C
　STORAGE TEMPERATURE:-30°C TO 70°C
4.LCD DRIVE IC:ILI9881D
5.VIEWING DIRECTION:ALL
6.GENERAL TOLERANCE:±0.20

LED CIRCUIT DIAGRAM

If=40mA
Vf=18V~20.4V

A(5:1)

5.0" HD TFT
720 X(RGB) X 1280 DOTS
ALL'0 CLOCK

pin	定义	pin	定义
1	GND	21	GND
2	TP_IOVCC_1V8	22	LCD_DIP
3	TP_VCC_2V85	23	LCD_DIN
4	GND	24	GND
5	TP_I2C_SCL	25	LCD_CLK_N
6	TP_I2C_SDA	26	LCD_CLK_P
7	GND	27	GND
8	TP_INT_N	28	LCD_D0P
9	TP_RST	29	LCD_D0N
10	DYNAMIC 4B	30	GND
11	DYNAMIC3B_A	31	LCD_D2P
12	DYNAMIC4B_A	32	LCD_D2N
13	DYNAMIC3B	33	LCD_D3P
14	GND	34	LCD_D3N
15	LCD_VDD_2V85	35	GND
16	LCD_IOVDD_1V8	36	GND
17	GND	37	LED-
18	LCD_ID	38	LED+
19	LCD_RST	39	GND
20	LCD_TE		

PIN	TP连接器定义
1	TP_IOVCC_1V8
2	TP_VCC_2V85
3	GND
4	TP_I2C_SCL_1.8V
5	TP_I2C_SDA_1.8V
6	GND
7	TP_RST_1.8V
8	TP_INT_N_1.8V
9	DYNAMIC3B_A
10	DYNAMIC3B
11	DYNAMIC4B
12	DYNAMIC4B_A

LCD_ID
R1:100k
R2:NC
IOVCC
欧姆

Model name:LMMDF050CXN1

Figure 1: Outline Drawing

4.   Interface signals

Table 2: Pin assignment

Pin No.	Symbol	Description
1	GND	Ground
2	TP_IOVCC_1V8	Power supply for TP I/O block
3	TP_VCC_2V85	Power supply for TP system
4	GND	Ground
5	TP_I2C_SCL	I2C interface system clock pin
6	TP_I2C_SDA	I2C interface data input pin
7	GND	Ground
8	TP_INT_N	I2C interface interrupt pin
9	TP_RST	I2C interface system reset pin
10	DYMAIC_4B	
11	DYMAIC_3B_A	
12	DYMAIC_3B	
13	DYMAIC_4B_A	
14	GND	Ground
15	LCD_VDD_2V85	Power supply for system
16	LCD_IOVCC_1V8	Power supply for I/O block
17	GND	Ground
18	LCD_ID	Hardware distinguishes between different screens
19	LCD_RST	Reset pin. This signal will reset the device and must be applied to properly initialize the chip
20	LCD_TE	Tearing effect output
21	GND	Ground
22	LCD_D1P	Positive polarity of low voltage differential data signal
23	LCD_D1N	Negative polarity of low voltage differential data signal
24	GND	Ground
25	LCD_CLK_N	Negative polarity of low voltage differential clock signal
26	LCD_CLK_P	Positive polarity of low voltage differential clock signal
27	GND	Ground
28	LCD_D0P	Positive polarity of low voltage differential data signal
29	LCD_D0N	Negative polarity of low voltage differential data signal
30	GND	Ground
31	LCD_D2P	Positive polarity of low voltage differential data signal
32	LCD_D2N	Negative polarity of low voltage differential data signal
33	GND	Ground
34	LCD_D3P	Positive polarity of low voltage differential data signal
35	LCD_D3N	Negative polarity of low voltage differential data signal
36	GND	Ground
37	LED-	Negative power supply for back light
38	LED+	Positive power supply for back light
39	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 (VCC)	VCC	-0.3	+3.6	V	1
Power supply voltage (IOVCC)	IOVCC	-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.

5.2 Environmental Condition

Table 4

Item	Operating temperature (Topr)		Storage temperature (Tstg) (Note 1)		Remark
	Min.	Max.	Min.	Max.	
Ambient temperature	-20°C	+60°C	-30°C	+70°C	Dry
Humidity (Note 1)	使箱内温度达到（60±2℃），相对湿度达到 90%～95％，温湿度稳定后持续 96h；				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=2.5V to 3.3V , IOVCC= 1.65V to 3.3V, GND=0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (analog)	VCC-GND		2.5	2.8	3.3	V
Supply voltage (logic)	IOVCC-GND		1.65	1.8/2.8	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 =40 mA Number of LED dies = 12	-	19.6	-	V
Luminance (on the module surface)			-	350	-	cd/m^2

7. Optical Characteristics

Table 7: Optical specifications

Items		Symbol	Condition	Specifications			Unit	
				Min.	Typ.	Max.		
Contrast Ratio		CR		-	800	-	-	
Response Time		T_R		-	10	-	ms	
		T_F		-	20	-	ms	
Chromaticity	Red	X_R			0.654		-	Note
		Y_R			0.319		-	
	Green	X_G			0.259		-	
		Y_G		-0.02	0.574	+0.02	-	
	Blue	X_B			0.140		-	
		Y_B			0.084		-	
	White	X_W			0.303		-	
		Y_W			0.323		-	
Viewing angle	Hor.	$\phi1$(3 o'clock)	Center CR≥10	-	80	-	deg.	
		$\phi2$(9 o'clock)		-	80	-		
	Ver.	$\theta2$(12 o'clock)		-	80	-		
		$\theta1$(6 o'clock)		-	80	-		
NTSC ratio				-			%	

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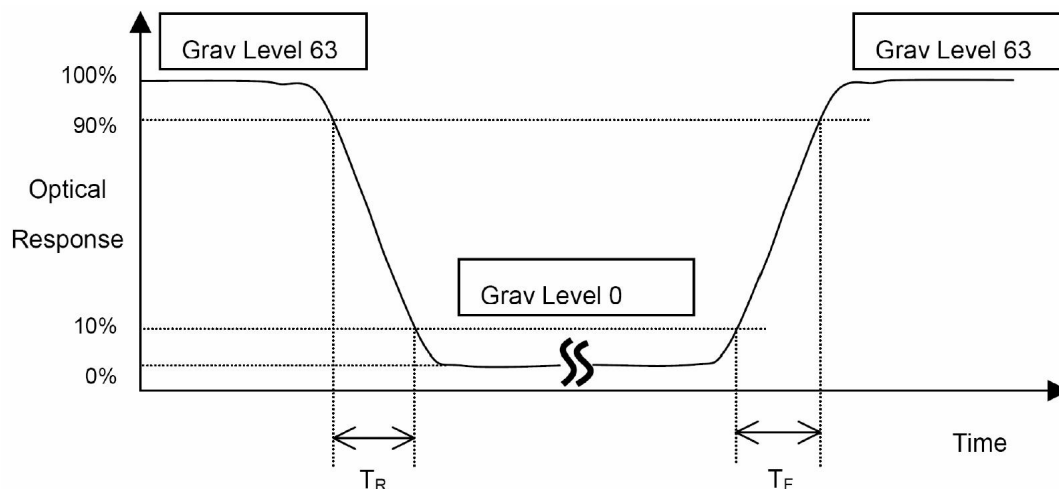
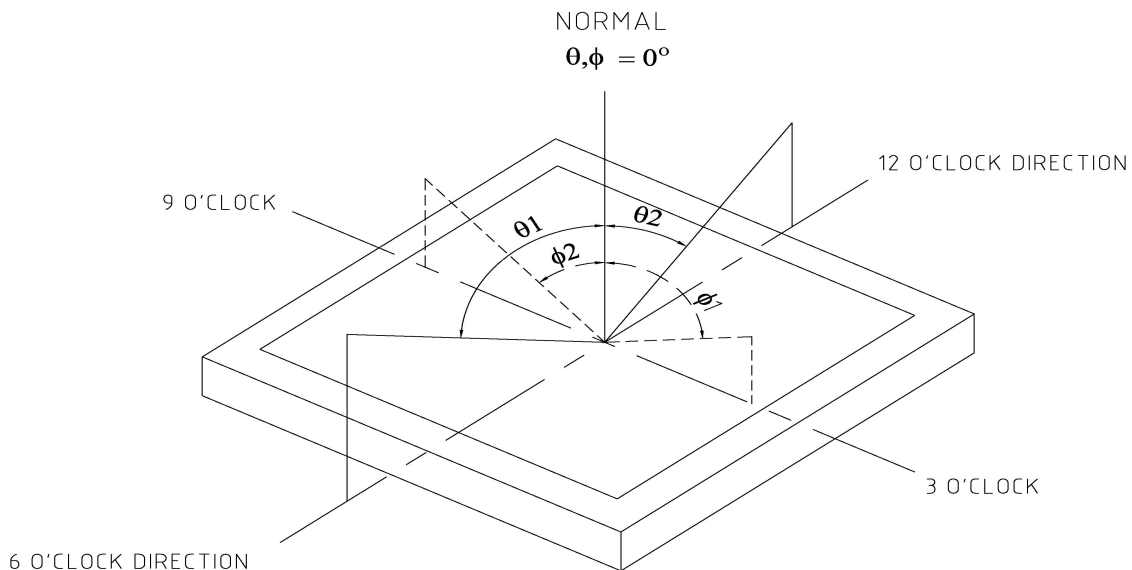Note 2: Definition of Response Time (TR, TF):

Figure 3

Note 3: Viewing Angle

NORMAL
$\theta, \phi = 0°$

12 O'CLOCK DIRECTION

9 O'CLOCK

$\theta 1$ $\theta 2$

$\phi 2$

$\phi 1$

3 O'CLOCK

6 O'CLOCK DIRECTION

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.

LCD Module

LCD Panel

Center of the Screen

Photometer
(TOPCON BM-5A)

Field of View = 2°

500 mm

Light Shield Room
(Ambient Luminance < 2 lux)
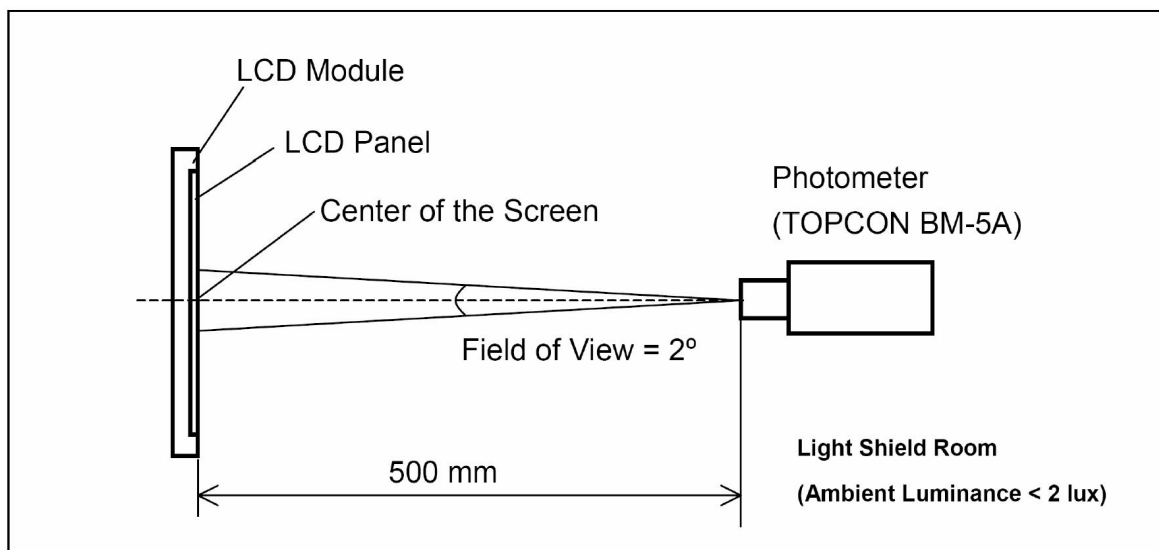
Figure 5

8. Timing Characteristics

8.1   80-system Bus Interface Timing Characteristics of IC

Table 8: Normal Write Mode (IOVCC=1.65~3.3V)

| 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
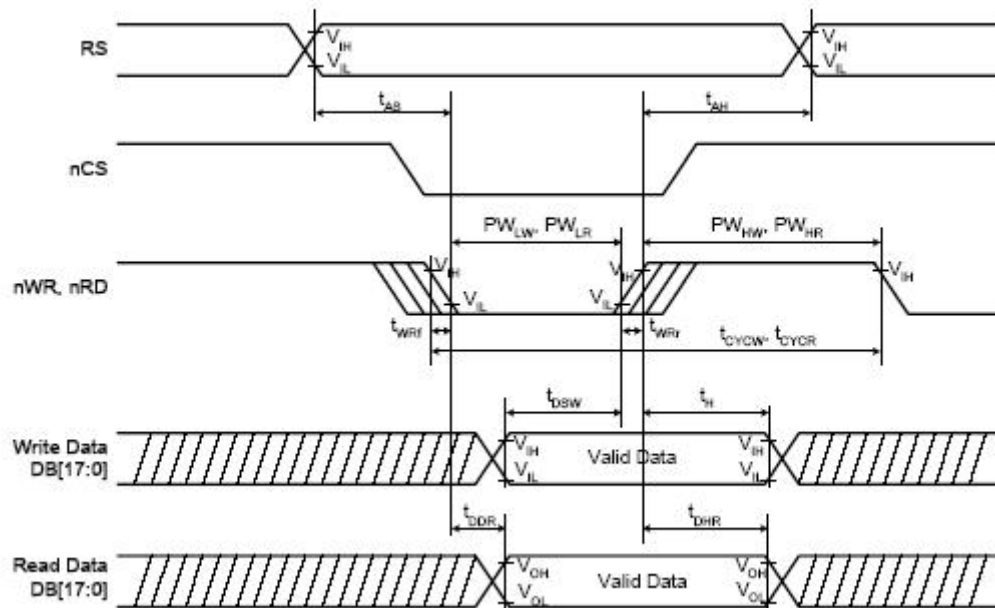
Figure 7. 80-system Bus Timing

8.2　Reset Operation of IC

Table 9: Reset Timing Characteristics (IOVCC=1.65~3.3V)

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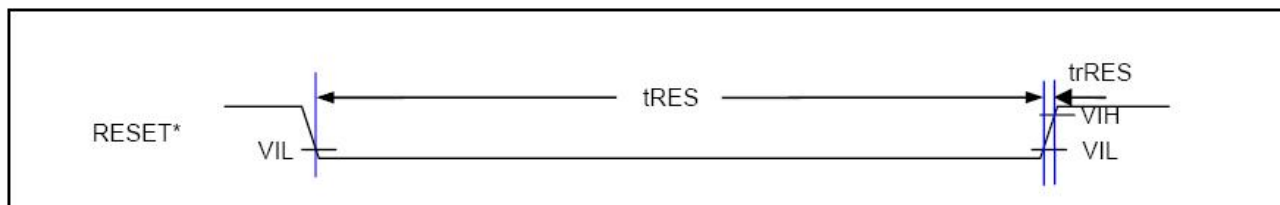
Figure 8: Reset Timing

9. Reliability Test Item

Test Item	Sample Type	Test　Condition	Test result determinant gist
High temperature storage	正常温度	60±3℃;96H	the inspection of appearance and　function character.
Low temperature storage	正常温度	-20±3℃;120H	
High temperature /humidity storage	正常温度	50℃±3℃,90%±3%RH;96H	
High temperature operation	正常温度	60±3℃;96H	no objection of　the function character; no fatal objection of the appearance.
Low temperature operation	正常温度	-20±3℃;96H	
High temperature /humidity operation	正常温度	40℃±3℃,90%±3%RH;96H	
Temperature Shock	正常温度	-20±3℃,30min→60±3℃,30 min;32cycle	inspect the objections appearance、function & the whole structure

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Packing (Reference only)

Packing Method

(1)

(2)

Use empty tray

Put products into the tray

(3)

(4)

(5)

(6)

seal

bending tape

lable
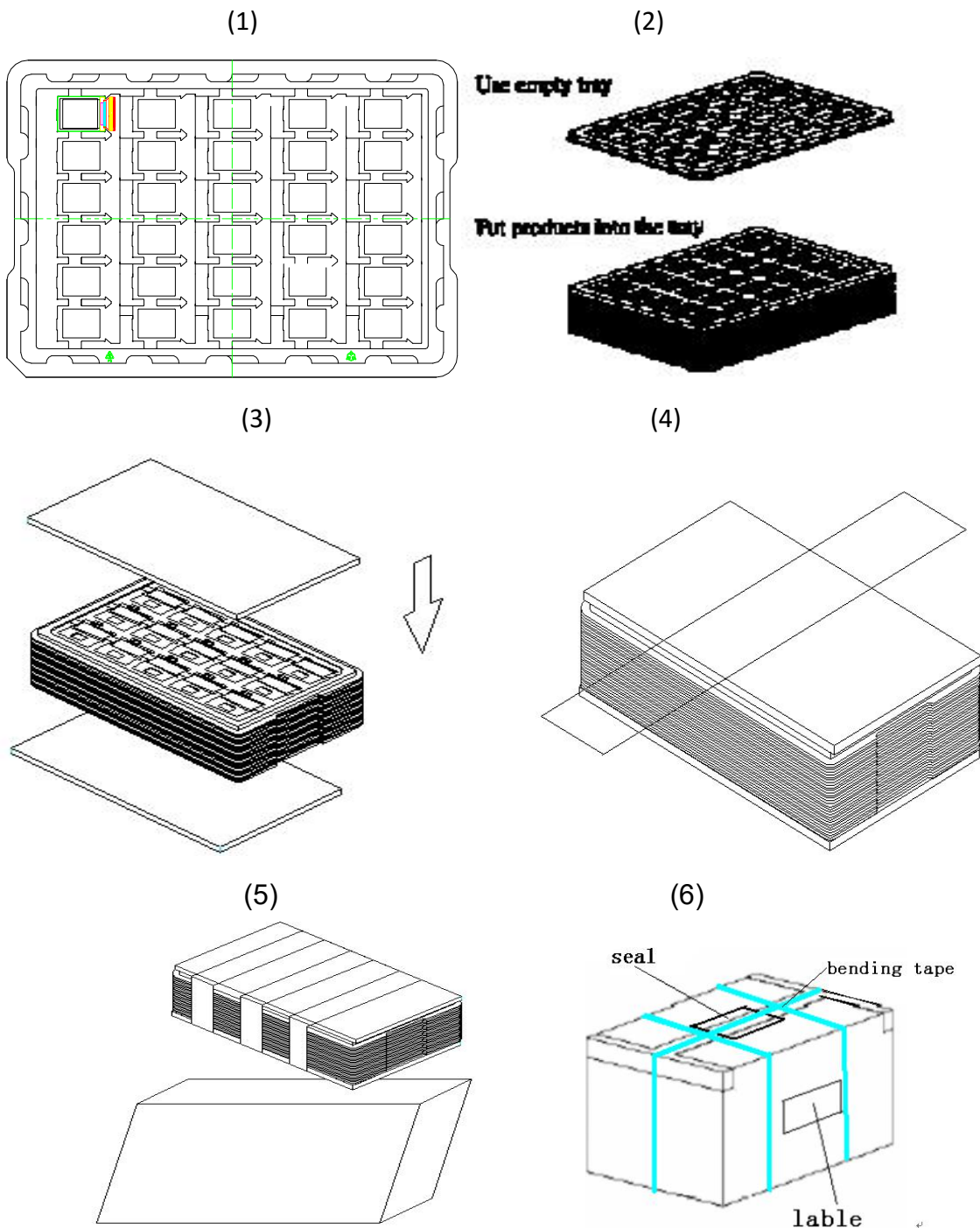
1. Put module into tray cavity :

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 -

■ Inspection Specifications

The buyer (customer) shall inspect the modules within twenty calendar days since the delivery date (the "inspection period") at its own cost. The results of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller.

The buyer may, under commercially reasonable reject procedures, reject an entire lot in the delivery involved if, within the inspection period, such samples of modules within such lot show an unacceptable number of defects in accordance with this incoming inspection standards, provided however that the buyer must notify the seller in writing of any such rejection promptly, and not later than within three business days of the end of the inspection period.

Should the buyer fail to notify the seller within the inspection period, the buyer's right to reject the modules shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

■ Warranty

Inteltronic Inc. warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

Inteltronic Inc. will be limited to replace or repair any of its module which is found and confirmed defective electrically or visually when inspected in accordance with Inteltronic Inc. general module inspection standard.

This warranty does not apply to any products which have been on customer's production line, repaired or altered by persons other than repair personnel authorized by Inteltronic Inc., or which have been subject to misuse, abuse, accident or improper installation. Inteltronic Inc. assumes no liability under the terms of this warranty as a consequence of such events.

If an Inteltronic Inc. product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. In returning the modules, they must be properly packaged with original package; there should be detailed description of the failures or defect.

■ RMA

Products purchased through Inteltronic Inc. and under warranty may be returned for replacement. Contact support@inteltronicinc.com for RMA number and procedures

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