POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	CDE012
SAMPLE CODE	:	SH800480T013-IHB
MASS PRODUCTION CODE	:	PH800480T013-IHB
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	009
DRAWING NO. (Ver.)	:	LMD-PH800480T013-IHB (Ver.004)
PACKAGING NO. (Ver.)	:	PKG-PH800480T013-IHB (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
黃秋源 **Oliver Huang**	石建莊 **Stone Shin**	黃俊清 **Ackey Huang**

POWERTIP
2018.12.20
TWRD APR

☐ Preliminary specification for design input

■ Specification for sample approval
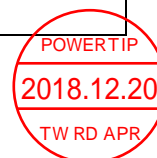
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NO.PT-A-005-8

History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
07/13/2016	01	001	New Drawing	-	徐明菲
09/08/2016	01	002	Modify Specs.(Drawing)	-	徐明菲
09/08/2016	01	003	New Sample.	-	Ackey
11/29/2016	01	004	Update RTP Interface Name.	-	Ackey
01/24/2017	01	005	Update Absolute Maximum Ratings.	-	Ackey
02/14/2017	01	006	Update Operational Power Supply For Backlight.	5	Ackey
03/13/2017	01	007	Modify Drawing.	Appendix	Ackey
08/03/2017	01	008	Update DC Electrical Characteristics.	5	Ackey
12/18/2018	01	009	Update DC Electrical Characteristics.	5	Ackey

Total: 30 Page

Contents

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Resolution	800 *3 (RGB) * 480 Dots
LCD Type	a-Si TFT , Normally white , Transmissive type
Screen size(inch)	7.0 inch
Viewing Direction	6 O'clock
Surface treatment	Anti-Glare
Color configuration	R.G.B. Vertical Stripe
Weight	-
Interface	24 Bits RGB Interface
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : http://www.powertip.com.tw/news_detail.php?Key=1&cID=1

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	164.9 (W) * 100.0 (L) * 4.95 (H)	mm

LCD panel

Item	Standard Value	Unit
Active Area	154.08 (W) * 85.92 (L)	mm

Note : For detailed information please refer to LCM drawing.

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Supply Voltage	VDD	GND=0	-0.3	+5.0	V	
Power Supply Voltage	VCC	GND=0	-0.3	+20.0	V	
Operating Temperature	T_{OP}	-	-20	+70	℃	-
Storage Temperature	T_{ST}	-	-30	+80	℃	

The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

1.4 DC Electrical Characteristics

Module   GND = 0V, Ta = 25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for TFT Panel	VDD	GND=0V	3.0	3.3	3.6	V
Power Supply for Backlight Unit	VCC	GND=0V	5	12	15	V
Input Voltage for TFT Panel	V_{IH}	GND=0V	0.7VDD	-	VDD	V
	V_{IL}	GND=0V	0	-	0.3VDD	V
Supply Current for TFT Panel	IDD	IDD@VDD=3.3V	-	110	165	mA
Supply Current for Backlight Unit	ICC	ICC@VCC=5V	-	650	780	mA
Supply Current for Backlight Unit	ICC	ICC@VCC=12V	-	240	360	mA
Input Voltage for PWM Signal	VPH	GND=0V	1.2	-	-	V
	VPL	GND=0V	-	-	0.4	V
Dimming Clock Rate	fP	GND=0V	5	-	100	KHz

1.5 Optical Characteristics

TFT LCD Module   VDD = 3.3 V, Ta=25℃

Item		Symbol	Condition	Min.	Typ.	Max.	unit	
Response time	Rise	Tr	-	-	10	20	ms	Note 2
	Fall	Tf		-	15	30		
Viewing angle	Top	θY+	CR ≥ 10	40	50	-	Deg.	Note 4
	Bottom	θY-		60	70	-		
	Left	θX-		60	70	-		
	Right	θX+		60	70	-		
Contrast ratio		CR	-	400	500	-	-	Note 3
Color of CIE Coordinate (LCD & BL & TP)	White	X	VCC=12.0V PWM="High" (Duty=100%)	0.25	0.30	0.35	-	Note1
		Y		0.29	0.34	0.39		
	Red	X		0.52	0.57	0.62		
		Y		0.30	0.35	0.40		
	Green	X		0.29	0.34	0.39		
		Y		0.55	0.60	0.65		
	Blue	X		0.10	0.15	0.20		
		Y		0.03	0.08	0.13		
Average Brightness Pattern=white display (LCD & BL & TP) *1		IV	VCC=12.0V PWM="High" (Duty=100%)	640	800	-	cd/m^2	Note1
Uniformity (LCD & BL & TP) *2		△B		70	-	-	%	Note1

Note 1:

*1：△B=B(min) / B(max) * 100%

*2：Measurement Condition for Optical Characteristics:

a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%


Colorimeter=BM-7 fast
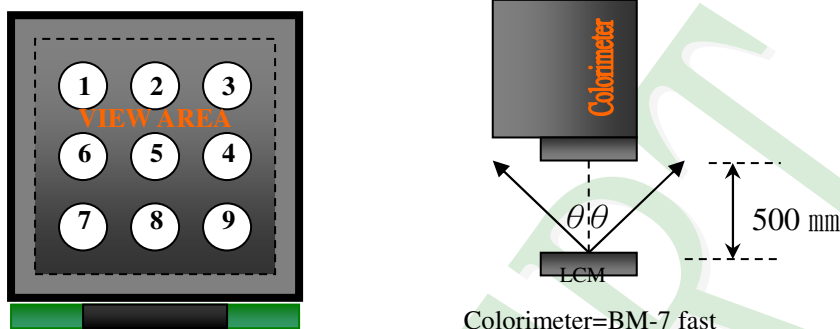
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

Note2: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(falling time) and from "white" to "black"(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:
Normally White

Normally Black

"Black"   "White"   "Black"

100%
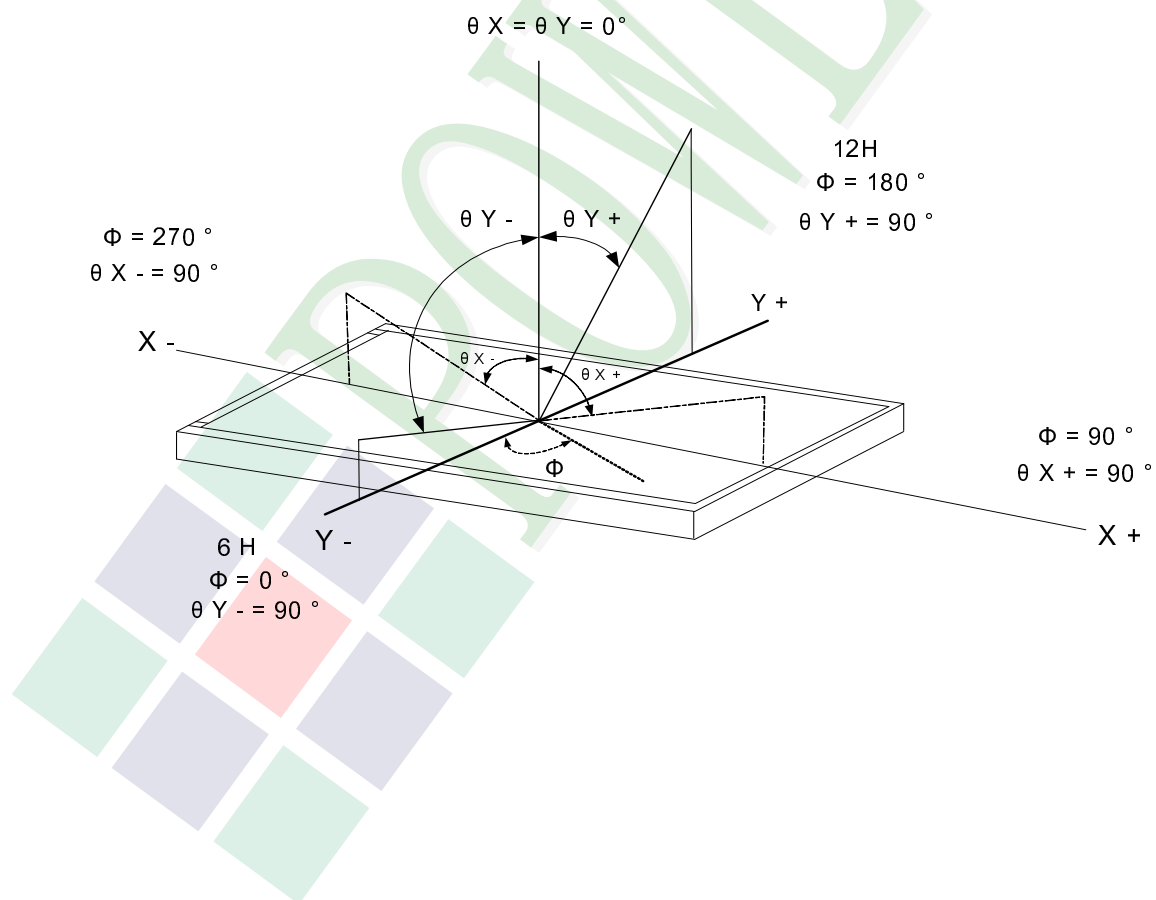90%

Signal (Relative value)

10%
0%

Tr   Tf
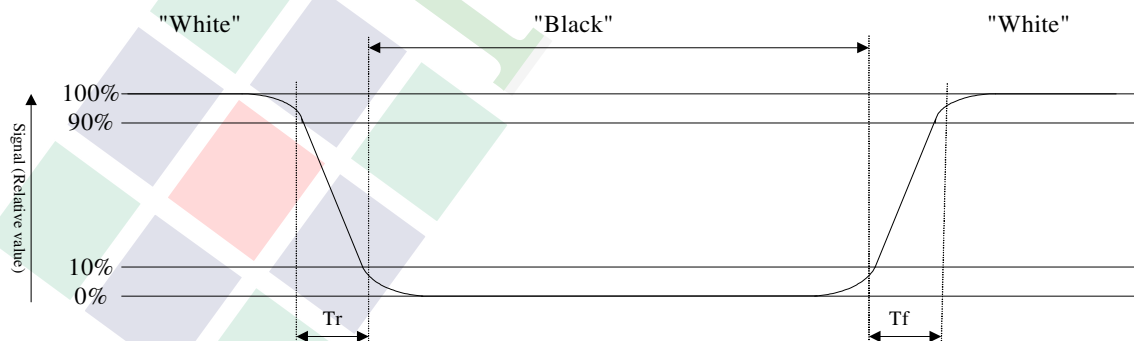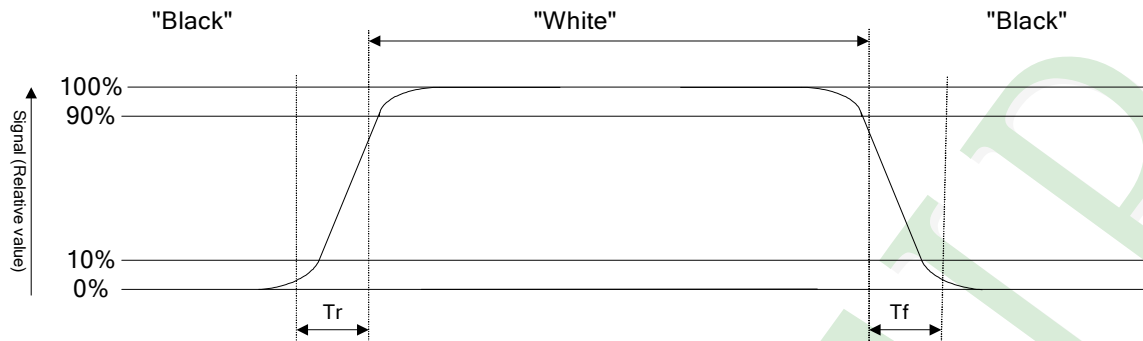
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

Note4: Definition of viewing angle:

Refer to figure as below:

θ X = θ Y = 0°

12H
Φ = 180°
θ Y + = 90°

Φ = 270°
θ X - = 90°

θ Y -   θ Y +

X -

Y +

θ X -

θ X +

Φ = 90°
θ X + = 90°

Φ

X +

6 H
Φ = 0°
θ Y - = 90°

Y -

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1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
LED Forward Current	I_F		35	mA	One LED
LED Reverse Voltage	V_R		10	V	

Electrical / Optical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Voltage	V_L	14.7	18.0	19.2	V	Note1
LED Current	I_L	-	140	-	mA	-
LED life time	-	50000	-	-	H_r	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25 ℃ and I_L =140 mA.

Note 2: The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25 ℃ and I_L =140 mA. The LED life time could be decreased if operating I_L is larger than 140 mA.
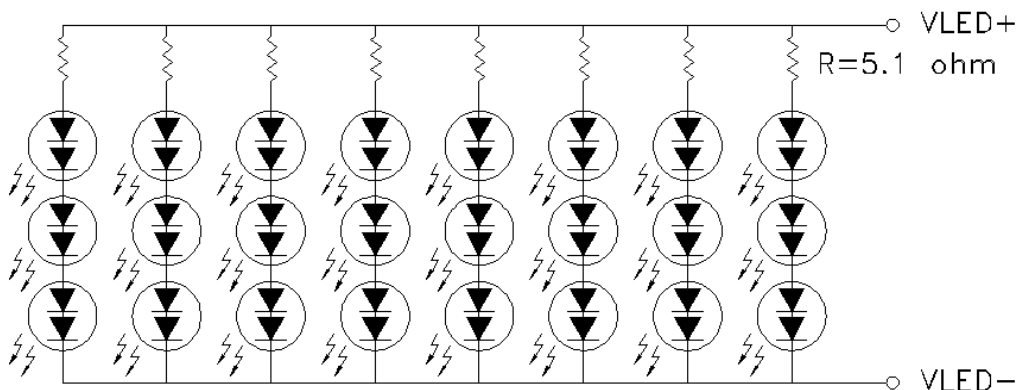
1.7 Touch Panel Characteristics

1.7.1 Optical Characteristics

Item	Specification
1.Transparency	80% Min

1.7.2 Mechanical Characteristic

| Item	Specification
1.Input Method	Finger or stylus pen
2.Hardness of surface	3H -pressure 500g of ,45deg.
3.Activation Force	250gf less individual point with stylus pen(R0.8)
	Activation force guarantee area:3.0mm inside of Active Area.
4.Linearity Force	150gf less input with stylus pen(R0.8)
	Activation force guarantee area:3.0mm inside of Active Area.

1.7.3 Electrical Characteristics

Item	Specification
1.Rated Voltage	DC 5V(DC 7V Max)
2.Resistance Between Terminals.	Direction X (Glass side): 500Ω~ 1000Ω
	Direction Y (Film side): 100Ω~ 500Ω
3.Insulation Resistance	20 MΩ or more (DC 25V 1min)
4.Linearity	±1.5%.
	Linearity(%)= $\Delta V / (EV-SV) *100$.
	ΔV: The difference between the ideal voltage and measured voltage on the each measuring line.
	SV: Voltage of starting Points.
	EV: Voltage of Ending Points.
	(Test condition refers to 1.7.2 item4)
5.Bouncing	<10ms (Tip R 3.75mm, hardness 10°~20° ,silicon rubber ,500gf operation : 40 mm/sec)

1.7.4 Reliability Characteristic

NO	Test Item	Test Condition	Test Result
1	Hitting Durability	1,000,000times min.(R 8 mm Silicon Rubber Hardness 60° 250gf 2times/sec).	Follow 1.7.3 item2 and item4.
2	Pen Sliding Durability	100,000 times min(Tip R0.8mm).	Follow 1.7.3 item2 and item4.
3	Impact Resistance	ψ9mm steel ball is dropped on the surface from 30 cm height at 1 time.	No Crack
4	Flexible pattern Bending Resistance	Bending 3 times by bending radius R1.0 mm	Follow 1.7.3 item2.

1.7.5 Touch Panel Design/Handing Guide

(1) Keep the gap, for example 0.2 to 0.3mm, between bezel edge and T/P edge.
   The reason is to avoid the bezel edge from contacting T/P surface that may cause "short" with
    bottom layer

(2) Insertion a cushion material is recommended.

(3) The cushion material should be limited on the busbar insulation paste area. If it is over the
   transparent insulation paste area, a "short" may be occurred.

(4) Do not to use an adhesive tape to bond it on the front of T/P and hang it to the housing bezel.

(5) Never expand the T/P top layer (PET Film) like a balloon by internal air pressure. The life of the T/P
   will extremely decreasing.

(6) Top layer, PET, dimension is changing base on environment temperature and humidity. Please
   avoid a stress from housing bezel to top layer, because it may cause "waving".

(7) The input to the Touch Panel sometimes distorts touch panel itself.

(8)To use the stylus pen or fingernail sliding at the edge of the housing is prohibited. It would cause
   the cracking of the ITO coating and damage the touch panel. It also request not to press this area
   while assembling

(9) Purpose: In order to prevent accidental use and performance deterioration, please keep the
            following precautions.
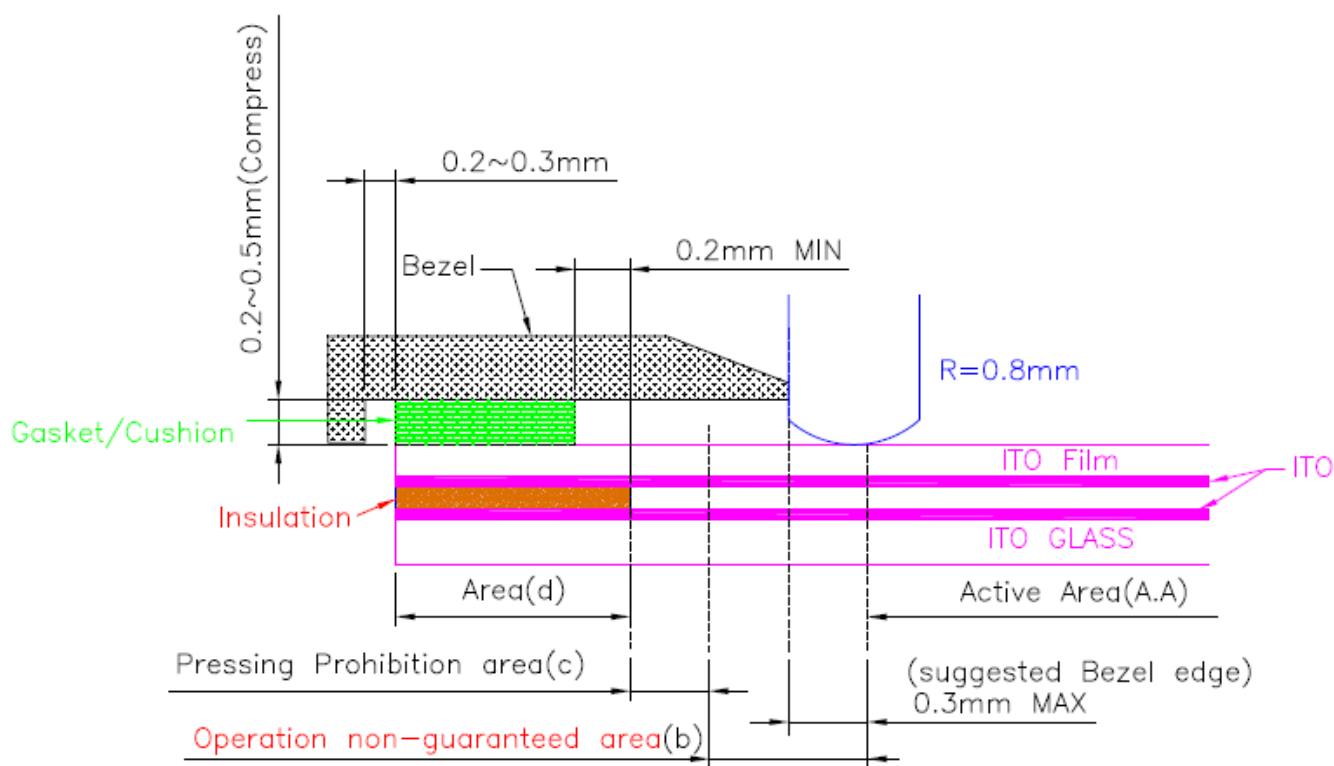
In order to prevent unusual performance degradation and malfunction of a touch panel, please carry
out the set case designing and a touch panel assembling method after surely considering the
definition of each area illustrated in above figure.

Area(a)：Active area

The active area is guaranteed the position data detectable precision, operation force and other operations. it is strongly recommended to place the operation button or menu keys within the active area. Due to structure, the active area is less durable at the edge or close to the edge.

Area(b)：Operation non-guaranteed area

This area does not guarantee a touch panel operation and its function. When this area is pressed, touch panel shows degradation of its performance and durability such as a pen sliding durability becomes about one-tenth compared with the active area (area-(a) as guaranteed area) and its operation force requires about double. About 0.5 mm outside from a boundary of the active area corresponds to this area.

Area(c)：Pressing prohibition area

The area which forbids pressing, because an excessive load is applied to a transparent electrode (ITO) and a serious damage is given to a touch panel function by pressing. About 0.5 mm outside from Operation non-guaranteed area .

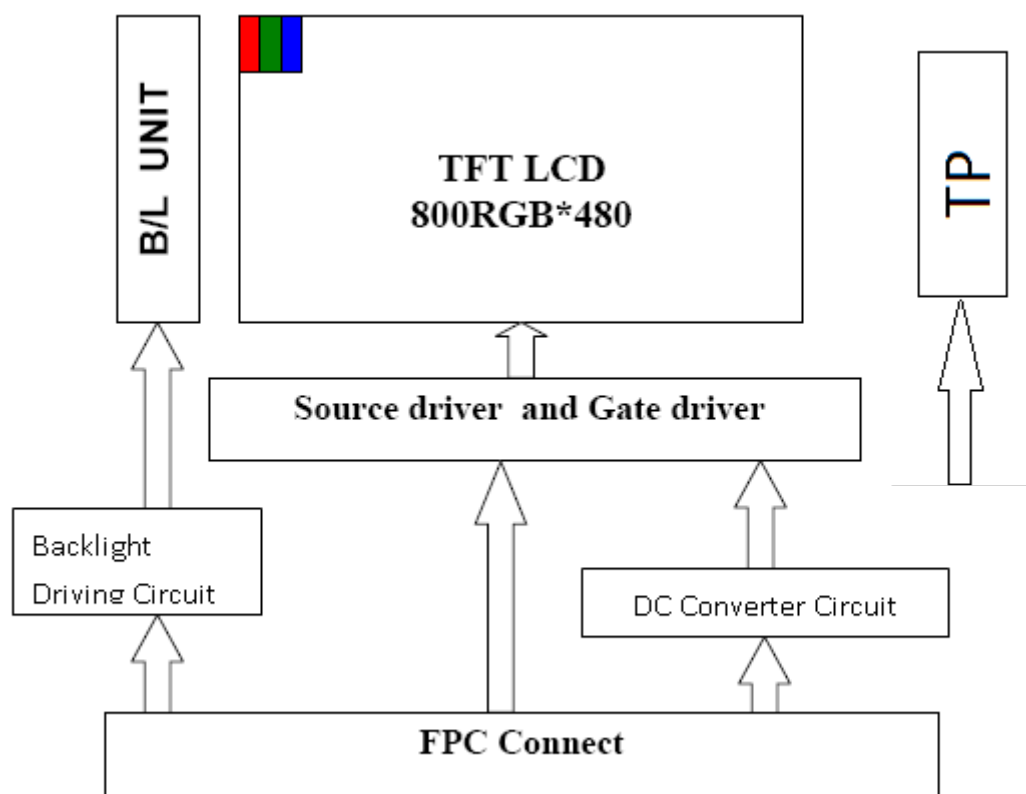Area(d)：Non-Active area

The area does not activate even if pressed.

2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram

```
 ┌─────────┐   ┌─────────────────────────────┐        ┌──────┐
 │         │   │ ■■■                         │        │      │
 │ B/L UNIT│   │      TFT LCD                │        │  TP  │
 │         │   │      800RGB*480             │        │      │
 └────▲────┘   └──────────────▲──────────────┘        └───▲──┘
      │                       │                           │
      │        ┌──────────────────────────────────┐       │
      │        │   Source driver  and Gate driver │       │
      │        └────────▲──────────────▲──────────┘       │
 ┌────┴─────────┐       │              │                   │
 │  Backlight   │       │    ┌─────────┴──────────────┐    │
 │ Driving Circuit│     │    │  DC Converter Circuit  │    │
 └────▲─────────┘       │    └──────────▲─────────────┘    │
      │                 │               │                  │
 ┌────┴─────────────────┴───────────────┴──────────────────┴──┐
 │                    FPC Connect                              │
 └─────────────────────────────────────────────────────────────┘
```

2.2   Interface Pin Description

TFT LCM Interface

Pin#	Name	DESCRIPTION
1	GND	Power Ground.
2	VDD	Power for Digital Circuit.
3	VDD	Power for Digital Circuit.
4	VCC	Power For LED backlight.
5	VCC	Power For LED backlight.
6	PWM	Shutdown & Dimming control input for backlight. Do not allow this pin to float. "Hi" =100%, "Low" = 0%.
7	GND	Power Ground.
8	R0	Red Data.
9	R1	Red Data.
10	R2	Red Data.
11	R3	Red Data.
12	GND	Power Ground.
13	R4	Red Data.
14	R5	Red Data.
15	R6	Red Data.
16	R7	Red Data.
17	GND	Power Ground.
18	G0	Green Data.
19	G1	Green Data.
20	G2	Green Data.
21	G3	Green Data.
22	GND	Power Ground.
23	G4	Green Data.
24	G5	Green Data.
25	G6	Green Data.
26	G7	Green Data.
27	GND	Power Ground.
28	B0	Blue Data.
29	B1	Blue Data.

Pin#	Name	DESCRIPTION
30	B2	Blue Data.
31	B3	Blue Data.
32	GND	Power Ground.
33	B4	Blue Data.
34	B5	Blue Data.
35	B6	Blue Data.
36	B7	Blue Data.
37	GND	Power Ground.
38	HS	Line synchronization signal. Horizontal Sync Input.
39	VS	Frame synchronization signal. Vertical Sync Input.
40	GND	Power Ground.
41	DE	Display enable pin from controller. Data Input Enable.
42	GND	Power Ground.
43	DCLK	Sample clock. Data shall be latched at the falling edge of DCLK.
44	GND	Power Ground.
45	CS(NC) / ID1	No Function./ ID[4:1]These pins select LCM type.
46	SDIN(NC) / ID2	No Function./ ID[4:1]These pins select LCM type.
47	SCK(NC) / ID3	No Function ./ ID[4:1]These pins select LCM type.
48	DISPLAY CONTROL / ID4	Display Enable(Hi Active)./ ID[4:1]These pins select LCM type.
49	/RESET	Global Reset(Low Active).
50	GND	Power Ground.

4-Wire Resistive Touch Screen (RTP) Interface

Pin No.	Symbol	Function
1	XR	TP: X right
2	YD	TP: Y bottom
3	XL	TP: X left
4	YU	TP: Y top

2.3 Timing Characteristics

2.3.1 Signal AC Characteristics
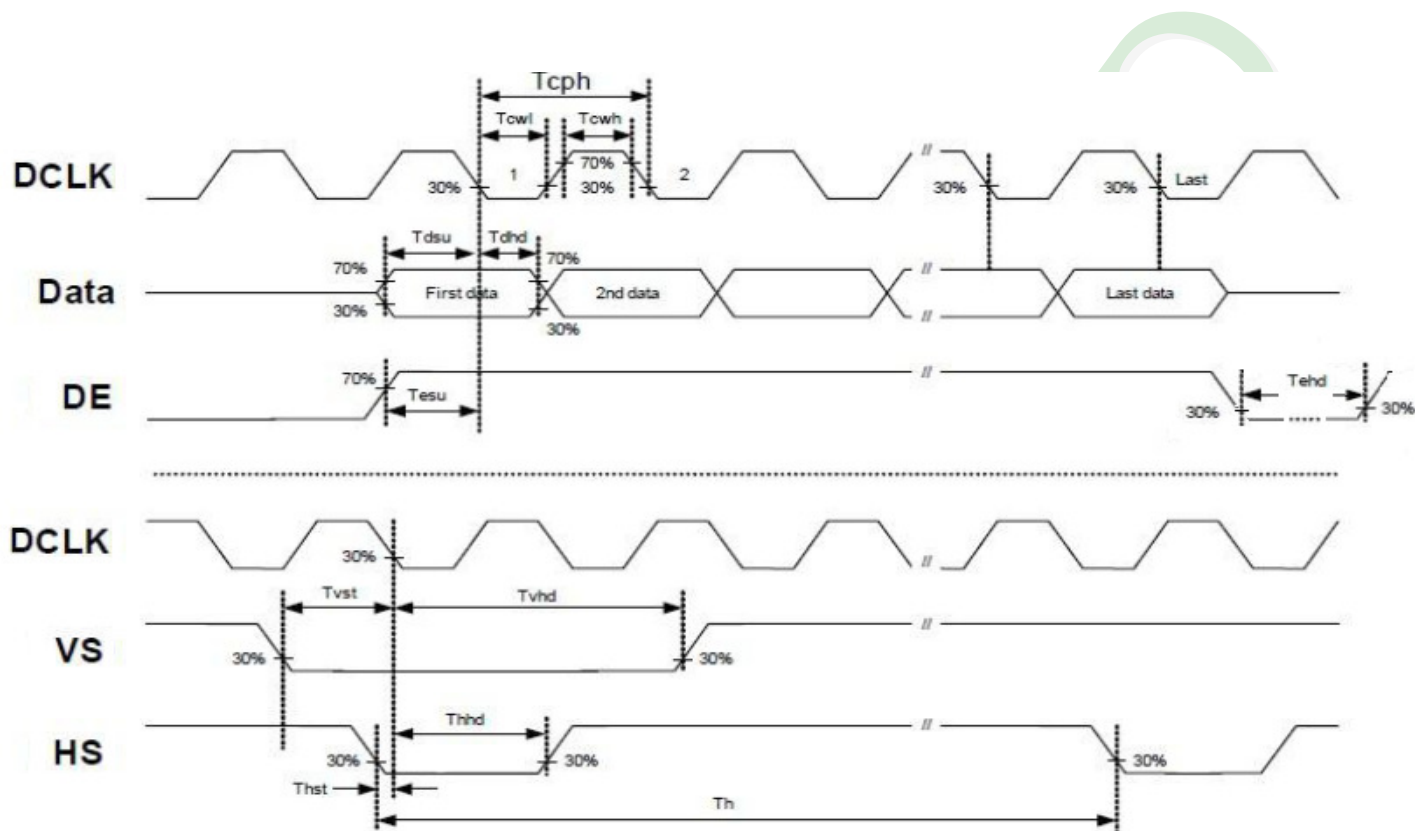
Item	Symbol	Values			Unit	Remark
		Min	**Typ**	**Max**		
HS setup time	Thst	8	-	-	ns	
HS hold time	Thhd	8	-	-	ns	
VS setup time	Tvst	8	-	-	ns	
VS hold time	Tvhd	8	-	-	ns	
Data setup time	Tdsu	8	-	-	ns	
Data hole time	Tdhd	8	-	-	ns	
DE setup time	Tesu	8	-	-	ns	
DE hold time	Tehd	8	-	-	ns	
DVDD Power On Slew rate	TPOR	-	-	20	ms	**From 0 to 90% DVDD**
RESET pulse width	TRst	1	-	-	ms	
DCLK cycle time	Tcph	20	30	-	ns	
Low Level Width	Tcwl	8	-	-	ns	
High Level Width	Tcwh	8	-	-	ns	
DCLK pulse duty	Duty	40	50	60	%	Tcwh / Tcph

2.3.2 Input Timing Setting

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	Thd		800		DCLK	
DCLK Frequency	Fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	Th	862	1056	1200	DCLK	
HS pulse width	Thpw	1		40	DCLK	
HS Blanking	Thb	46	46	46	DCLK	
HS Front Porch	Thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	Tvd		480		TH	
VS period time	Tv	510	525	650	TH	
VS pulse width	Tvpw	1		20	TH	
VS Blanking	Tvb	23	23	23	TH	
VS Front Porch	Tvfp	7	22	147	TH	

Horizontal input timing diagram
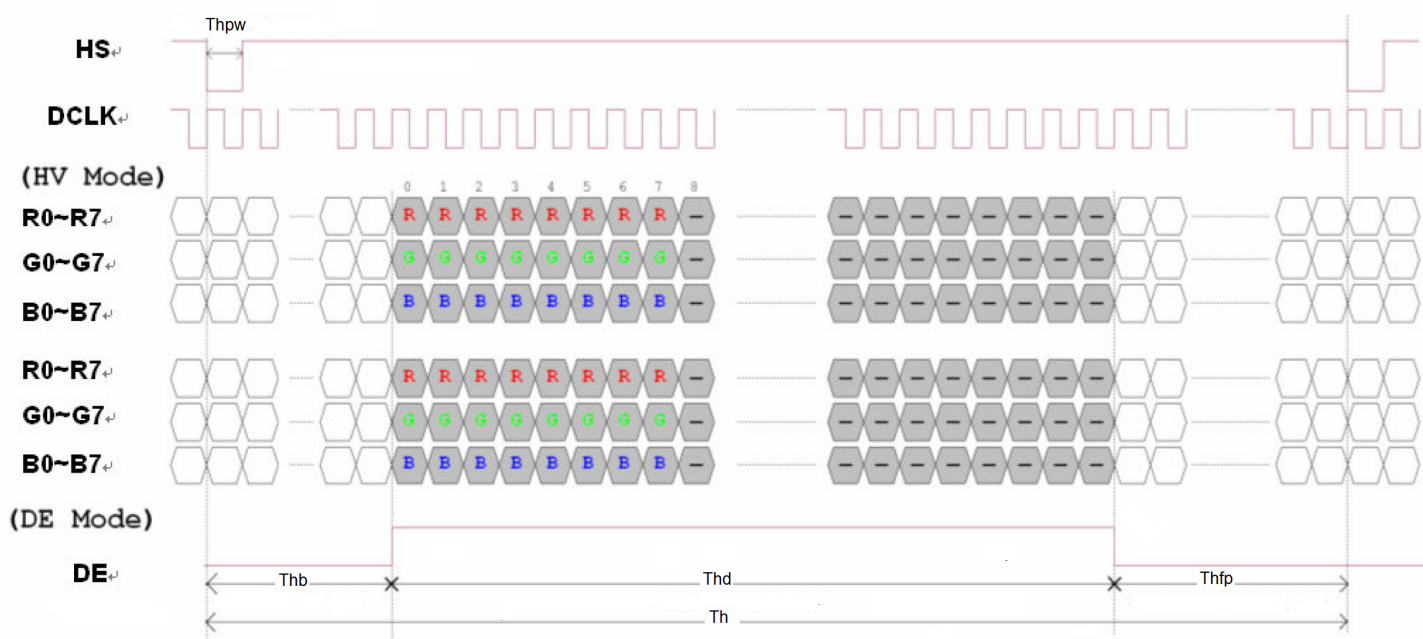
Vertical input timing diaqram
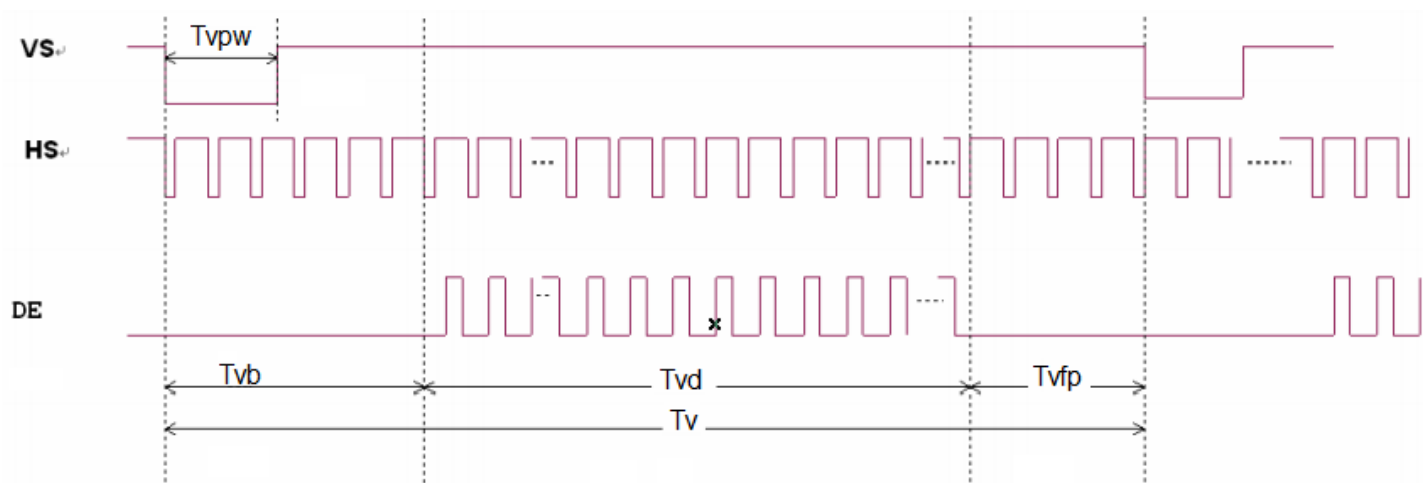
2.3.3 Power Sequence

POWER ON
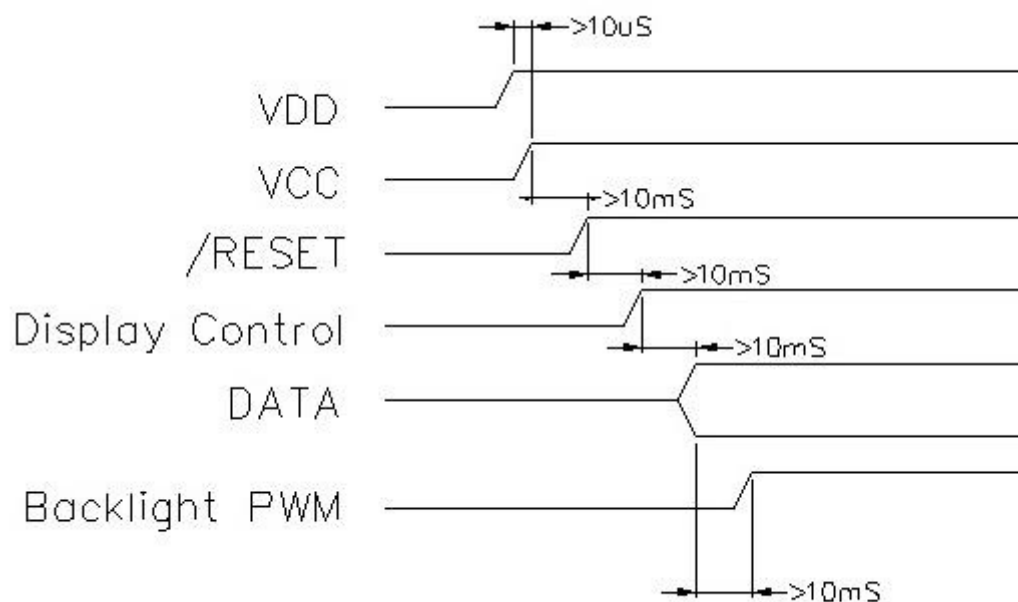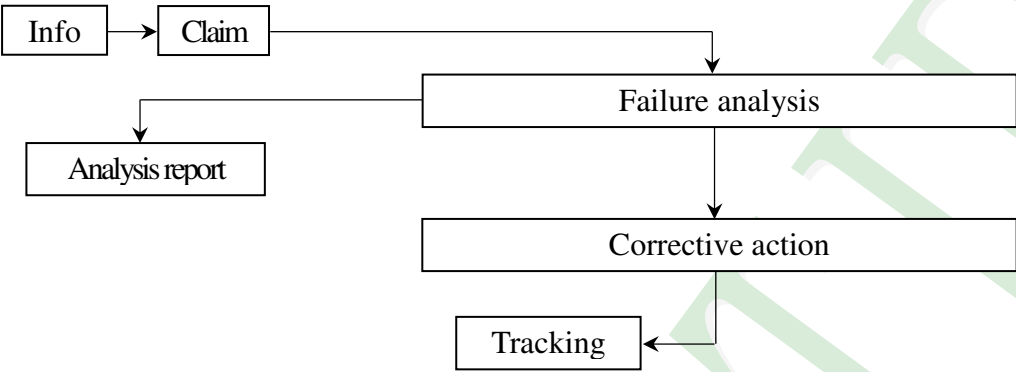
POWER OFF
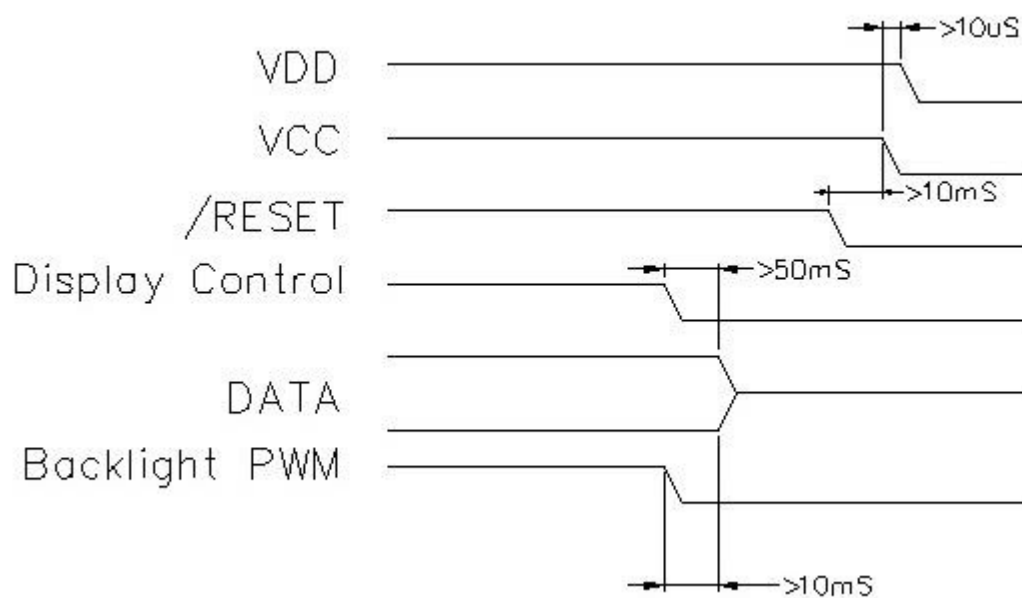
3. QUALITY ASSURANCE SYSTEM

3.1   Quality Assurance Flow Chart

Item	Customer	Sales	R&D	Q.A	Manufactu ring	Product control	Purchase	Inventory control

Marketing & Design

Info → Survey

Request → Inquiry → Project evaluation

Project Validation

NG

Quote   OK

Contract

Sample Approval

Design check

Sample test

NG

Verification

OK

NG

Sample approval   OK

Pilot Run & Mass Product

Pilot run & Reliability test

NG

Verification

OK

Specification preparation

Mass production

OK   Inspection   NG

Ship Out

Shipment

Ship out

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

Sales Service flow:

Info → Claim → Failure analysis

Analysis report

Failure analysis → Corrective action → Tracking

3.2. Inspection Specification

◆Scope：The document shall be applied to TFT-LCD Module for 3.5″ ~10″ (Ver.B01).

◆Inspection Standard：MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ.

◆Equipment：Gauge、MIL-STD、Powertip Tester、Sample

◆Defect Level：Major Defect　AQL：0.4　;　Minor Defect　AQL：1.5

◆OUT Going Defect Level：Sampling.

◆Standard of the product appearance test：

　　a. Manner of appearance test：

　　（1）. The test best be under　20W×2 fluorescent light，and distance of view must be at　30　cm.

　　（2）. The test direction is base on about around 45° of vertical line.
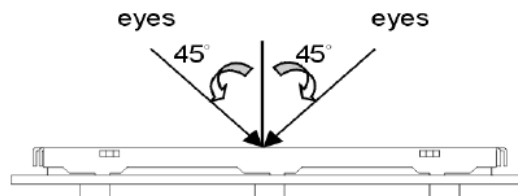
　　（3）. Definition of area.
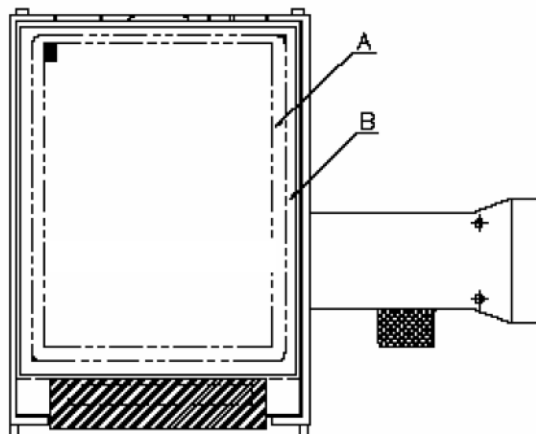
A area : viewing area

B area : Outside of viewing area

　　（4）. Standard of inspection：　(Unit：mm)

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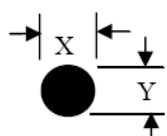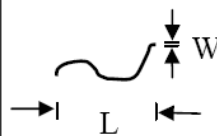
◆Specification For TFT-LCD Module 3.5″ ~10″ :   (Ver.B01)

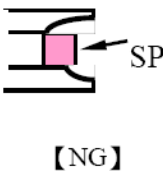| NO	Item	Criterion	Level
01	Product condition	1.1 The part number is inconsistent with work order of production.	Major
		1.2 Mixed product types.	Major
		1.3 Assembled in inverse direction.	Major
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	3.1 Product dimension and structure must conform to structure diagram.	Major
04	Electrical Testing	4.1 Missing line character and icon.	Major
		4.2 No function or no display.	Major
		4.3 Display malfunction.	Major
		4.4 LCD viewing angle defect.	Major
		4.5 Current consumption exceeds product specifications.	Major
05	Dot defect (Bright dot、 Dark dot) On -display		Minor

	Item	Acceptance (Q'ty)
Dot Defect	Bright Dot	≦ 4
	Dark Dot	≦ 5
	Joint Dot	≦ 3
	Total	≦ 7

5.1 Inspection pattern：full white , full black , Red , Green and blue screens.
5.2 It is defined as dot defect if defect area ＞1/2 dot.
5.3 The distance between two dot defect ≧5 mm.
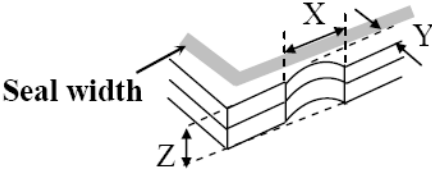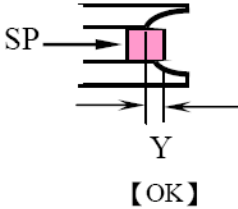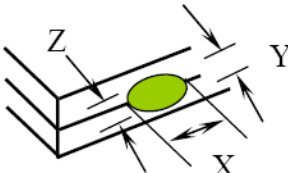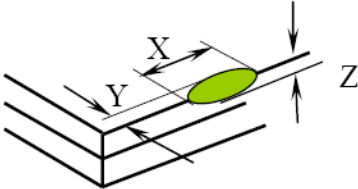
◆**Specification For TFT-LCD Module 3.5″ ~10″：** (Ver.B01)

NO	Item	Criterion	Level
06	**Black or white dot、scratch、contamination** **Round type** $\Phi = (x+y)/2$ **Line type** 	**6.1 Round type (Non-display or display)：** See round type table below. **6.2 Line type(Non-display or display)：** See line type table below.	**Minor**
07	**Polarizer Bubble**	See polarizer bubble table below.	**Minor**

6.1 Round type (Non-display or display)：

Dimension (diameter：Φ)	Acceptance (Q'ty)	
	A area	**B area**
$\Phi \leqq 0.25$	**Ignore**	**Ignore**
$0.25 < \Phi \leqq 0.50$	5	
$\Phi > 0.50$	0	
Total	5	

6.2 Line type(Non-display or display)：

Length (L)	Width (W)	Acceptance (Q'ty)	
		A area	**B area**
---	$W \leqq 0.03$	Ignore	Ignore
$L \leqq 10.0$	$0.03 < W \leqq 0.05$	4	
$L \leqq 5.0$	$0.05 < W \leqq 0.10$	2	
---	$W > 0.10$	As round type	
Total		5	

Dimension (diameter：Φ)	Acceptance (Q'ty)	
	A area	**B area**
$\Phi \leqq 0.25$	Ignore	Ignore
$0.25 < \Phi \leqq 0.50$	4	
$0.50 < \Phi \leqq 0.80$	1	
$\Phi > 0.80$	0	
Total	5	
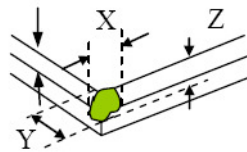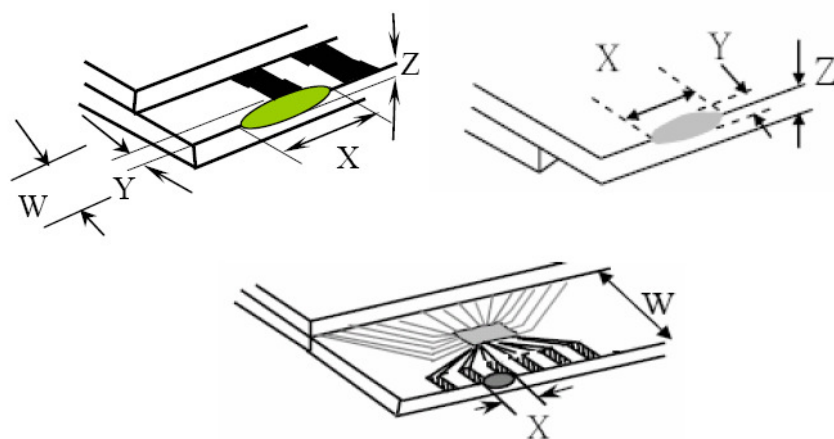
◆**Specification For TFT-LCD Module** 3.5″ ~10″ : (Ver.B01)

NO	Item	Criterion	Level
08	The crack of glass	Symbols： X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length 8.1 General glass chip： 8.1.1 **Chip on panel surface and crack between panels:** 	Minor

X	Y	Z
$\leqq$ a	Crack can't enter viewing area	$\leqq 1/2$ t
$\leqq$ a	Crack can't exceed the half of SP width.	$1/2$ t $<$ Z $\leqq 2$ t

NO	Item	Criterion	Level
08	The crack of glass	Symbols： X : The length of crack　　Y : The width of crack. Z : The thickness of crack　　W : terminal length t : The thickness of glass　　a : LCD side length 8.1.2 Corner crack： <table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≦1/5 a</td><td>Crack can't enter viewing area</td><td>Z ≦1/2 t</td></tr><tr><td>≦1/5 a</td><td>Crack can't exceed the half of SP width.</td><td>1/2 t < Z ≦2 t</td></tr></table> 8.2 Protrusion over terminal： 8.2.1 Chip on electrode pad： <table><tr><td></td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>Front</td><td>≦ a</td><td>≦ 1/2 W</td><td>≦ t</td></tr><tr><td>Back</td><td>≦ a</td><td>≦ W</td><td>≦ 1/2 t</td></tr></table>	Minor

NO	Item	Criterion	Level
08	The crack of glass	Symbols： X : The length of crack Y : The width of crack. Z : The thickness of crack W : terminal length t : The thickness of glass a : LCD side length 8.2.2 Non-conductive portion： | X	Y	Z
---	---	---
≦ 1/3 a	≦ W	≦ t | ⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. 8.2.3 Glass remain： | X	Y	Z
---	---	---
≦ a	≦ 1/3 W	≦ t		Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition   (Ver.B01)

NO.	TEST ITEM	TEST CONDITION
1	**High Temperature Storage Test**	Keep in +80 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
2	**Low Temperature Storage Test**	Keep in −30 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
3	**High Temperature / High Humidity Storage Test**	Keep in +60 ℃ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)
4	**Temperature Cycling Storage Test**	−30℃ → +25℃ → +80℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.
5	**ESD Test**	**Air Discharge:** Apply 2 KV with 5 times Discharge for each polarity +/- **Contact Discharge:** Apply 250 V with 5 times discharge for each polarity +/- 1. Temperature ambiance : 15℃～35℃ 2. Humidity relative : 30%～60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330Ω±10% 5. Discharge, mode of operation : Single Discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : ±5%)
6	**Vibration Test (Packaged)**	1. Sine wave 10～55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs
7	**Drop Test (Packaged)**	(see drop table below)

Drop Test Table:

Packing Weight (Kg)	Drop Height (cm)
0 ~ 45.4	122
45.4 ~ 90.8	76
90.8 ~ 454	61
Over 454	46

Drop Direction :※1 corner / 3 edges / 6 sides each 1time

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

5.1.1   If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

5.1.2   If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

5.2.1   Avoid any strong mechanical shock which can break the glass.

5.2.2   Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.

5.2.3   Do not remove the panel or frame from the module.

5.2.4   The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

5.2.5   Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.

5.2.6   Do not touch the display area with bare hands , this will stain the display area.

5.2.7   Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8   To control temperature and time of soldering is 320±10℃ and 3-5 sec.

5.2.9   To avoid liquid (include organic solvent) stained on LCM .

5.3 STORAGE

5.3.1   Store the panel or module in a dark place where the temperature is 25℃ ±5℃ and the humidity is below 65% RH.

5.3.2   Do not place the module near organics solvents or corrosive gases.

5.3.3   Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

5.4.1   Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

5.4.2   Unaccepted responsibility

This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

Drawing Frame Information

REV		REV BY	REVISER	DATE	Approve			
007								
006								
005								
004	MODIFY DRAWING	Kevin		2017/03/10				
003	MODIFY DRAWING	Kevin		2016/11/30				
002	MODIFY DRAWING	Terry	Terry	2016/09/14				
001	NEW DRAWING			2016/07/13				

NOTES:
1. LCD TYPE: TFT LCD
2. LCD DISPLAY: POSITIVE/TRANSMISSIVE
3. VIEW DIRECTION: 6 O'CLOCK
4. The tolerance unless classified ±0.3mm
5. LCM suggested connector : CviLux CF31501D0R2-05-NH or compatible.
   FPC suggested connector : CviLux CF07041U0R0-LF or compatible.

DETAIL X1
SCALE 4X

DETAIL A
SCALE 3X

3.0±0.3
0.5±0.1
W=0.35
S0.15
P0.5x49=24.5±0.1
25.5±0.1

W=0.7±0.05
1.0±0.1
2-R0.5
P1.0X3=3.0±0.1
5.0±0.1
3.0±0.5
5.0±0.5

PIN 4
PIN 1
XL
YU
XL
YD
XR
YD
YU
XR

PART NO: PH800480T013-IHB
DRAWING NAME : LMD-PH800480T013-IHB
TITLE: LCD MODULE DRAWING

大正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

	Design	Check	Approve	
	Kevin	Stone	Oliver	

Surface	Material	Thickness	Quantity

Unit	Scale	Page
MM	1:1	1/1

Length(Min)	Tolerance Precision	Precision Level
1 ~ 4	-	-
4 ~ 16	-	-
16 ~ 63	-	-
63 ~ 250	-	-
250 ~ 1000	-	-

58.31±0.5
49.13±0.5
100.0(O.D)
98.9(T/P O.D)
90.24MIN(Gasket open area)
89.24(T/P V.A)
88.24(T/P A.A)
85.92(LCD A.A)
0.22 +0.3 -0.22
2.62
3.12
3.62
4.78
(52.26)

164.9(O.D)
157.2MIN(Gasket open area)
156.2(T/P O.D)
155.2(T/P V.A)
154.08(LCD A.A)
(80.96)
0.09 +0.3 -0.09
5.34
5.84
6.34
6.9

68.21±0.5
50.91±0.5
(5.45)
(23.3)

800(R,G,B)X480 DOTS
VIEWING DIRECTION
XL
YU
XR
YD

2.1Max.(Component heigh)
0.3±0.05
0.3±0.05
Conductor side
Stiffener
4.95

Pull tape

EMI FILM
Aluminum Foil Conductive Adhesive Tape
Stiffener(SUS t=0.2mm)(to GND)
Shading Tape

1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH800480T013-IHB	164.9 X 100.0 X 4.95	0.168	60	10.08
2	靜電袋(1)Antistatic Bag	BAG240170ARABA	240 X 170	0.0048	60	0.288
3	上蓋(2)EPE	FOAM000000078	310 X 250 X 90	0.1	4	0.4
4	下座(3)EPE	FOAM000000079	310 X 250 X 100	0.17	4	0.68
5	海綿墊(4)Foam Rubber Cushion	OTFOAM00006ABA	290 X 240 X 10	0.0058	4	0.0232
6	外紙箱(5)Carton	BX52732536CCBA	527 X 325 X 360	1.092	1	1.092
7						
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) : 　12.56　Kg±10%

3.單箱數量規格表 (Packaging Specifications and Quantity) :

(1)Total LCD quantity in carton : quantity per box 　15　 x no of boxes 　4　 = 　60

(4)海綿墊
Foam Rubber Cushion

(2)上蓋
EPE

(5)外紙箱
Carton

(1)靜電袋+LCM
Antistatic Bag+LCM

(3)下座
EPE
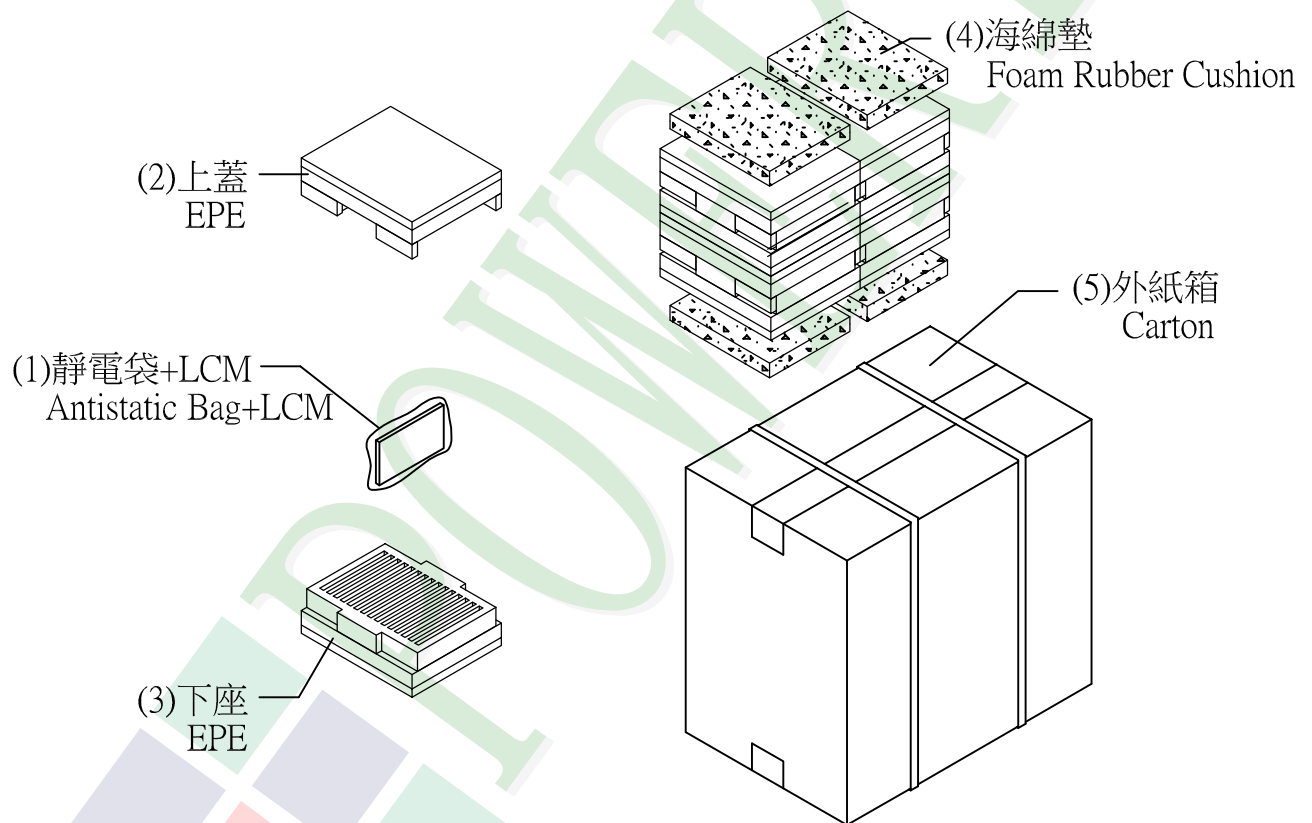
特 記 事 項 (REMARK)

4. 包裝數量不足時需以EPE(舒美墊)填補空槽

EPE:OTFOAMEP0003BA自裁成

(166.5X109.0X10mm)

POWERTIP TECH. CORP.