SPECIFICATIONS								
CUSTOMER :								
SAMPLE CODE	SH800480T013-IFC05							
MASS PRODUCTION CODE	PH800480T013-IFC05							
SAMPLE VERSION :	01							
SPECIFICATIONS EDITION :	003							
DRAWING NO. (Ver.)	LMD-PH800480T013-IFC05(Ver.002)							
PACKAGING NO. (Ver.)	PKG-PH800480T013-IFC05(Ver.001)							

Customer Approved

Checked

林裘中

Daniel Lin

Designer 廖志豪 Rex Liao

Date:

☐ Preliminary specification for design input

Specification for sample approval

Approved

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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
08/20/2018	01	001	Preliminary Drawing.	-	Rex
11/14/2018	01	002	First Sample SPEC	-	Rex
12/19/2019	01	003	Modify Thickness from 12.64mm to 10.4mm Modify Interface Pin Description	4 10	Rex

Total: 22 Pages





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Appendix: 1. LCM Drawing

Note: For detailed information please refer to IC data sheet: FTDI -- FT813



1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Resolution	800 * 3 (RGB) * 480 Dots
LCD Type	a-Si TFT , Normally white, Transmissive type
Touch Panel	True Multi-Touch Capacitive Touch Panel True Multi-touch with up to 5 Points of Absolution
Screen size(inch)	7.0 inch
Viewing Direction	6 O'clock
Color configuration	RGB Vertical Strip
Backlight Type	White LED B/L
Weight	200g
Interface	SPI
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		186.8(W) x 110.56 (L) x 10.4 (max) (H)	mm
Active Area		154.08 (W) * 85.92 (L)	mm

Note: For detailed information please refer to LCM drawing



1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Supply for TFT Panel	VDD	GND=0	-0.3	+4.0	V	
Power Supply for Backlight Unit	VCC	GND=0	-0.3	+20.0	V	-
Operating Temperature	Тор	-	-20	70	°C	
Storage Temperature	T _{ST}	-	-30	80	°C	

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

GND = 0V, Ta = 25°C

						-,
Item	Symbol	Condition	Min.	Тур.	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	1	9	V
Input Voltage for	VIH	GND=0V	2.0	-	VDD	
TFT Panel	VIL	GND=0V	0	-	0.8	V
Supply Current for TFT Panel	IDD	IDD@VDD=3.3V	-	140	180	mA
Supply Current for Backlight Unit	ICC	ICC@VCC=5V	1	480	500	IIIA



1.5 Optical Characteristics

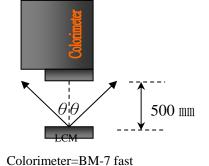
VDD= 3.3 V, Ta=25°C

Item		Symbol	Condition	Min.	Тур.	Max.	unit	-
Response time	Tr+Tf	25 ℃	-	-	25	50	ms	-
	Тор	θΥ+			60	-		
Viewing angle	Bottom	θΥ-	CR ≥ 10		60	-	Dog	Note 4
Viewing angle	Left	θX-	CR 2 10		60	1	Deg.	Note 4
	Right	θX+			60	-		
Contrast rati	0	CR		500	600		1	Note 3
	White	Χ		(0.25)	(0.30)	(0.35)		
	vviile	Υ		(0.28)	(0.33)	(0.38)		Note1
Color of CIE	Red	X	Ta = 25°C θX , θY = 0°	(0.51)	(0.56)	(0.61)		
Color of CIE Coordinate		Υ		(0.30)	(0.35)	(0.40)		
(With B/L & T/P)	Green	Х		(0.29)	(0.34)	(0.39)		Note
(VVIIII D/L & T/I)		Υ		(0.55)	(0.60)	(0.65)		
	Blue	Χ		(0.10)	(0.15)	(0.20)		
	Diue	Υ	. 4	(0.02)	(0.07)	(0.12)		
Average Brightness Pattern=white display (With T/P)*1		IV	VCC=5.0V (PWM Duty:100%)	380	460	-	cd/m2	Note1
Uniformity (With T/P)*2	2	∆В	VCC=5.0V (PWM Duty:100%)	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: $500 \pm 50 \text{ mm}$ \rightarrow ($\theta = 0^{\circ}$)
 - 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%







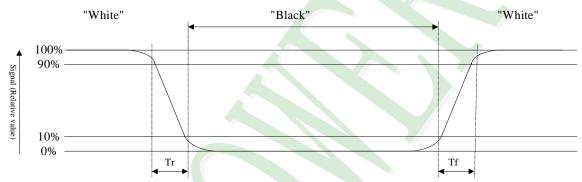
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

Note2: Definition of response time:

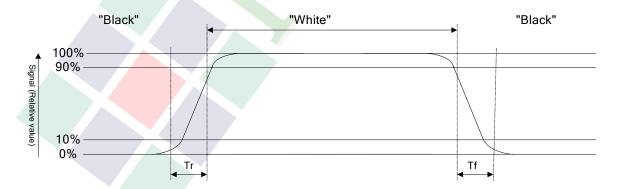
The output signals of photo detector are measured when the input signals are changed from "black" to "white" (falling time) and from "white" to "black" (rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

Normally White



Normally Black





Note3: Definition of contrast ratio:

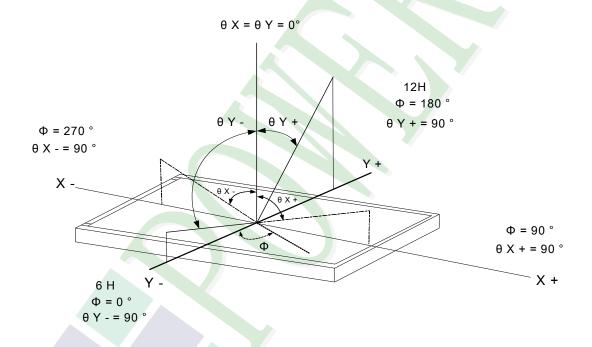
Contrast ratio is calculated with the following formula

Photo detector output when LCD is at "White" state

Contrast ratio (CR) =

Photo detector output when LCD is at "Black" state

Note4: Definition of viewing angle: Refer to figure as below:





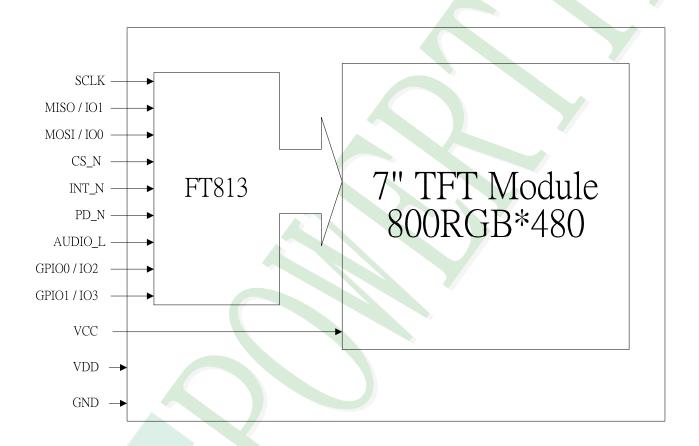
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram





2.2 Interface Pin Description

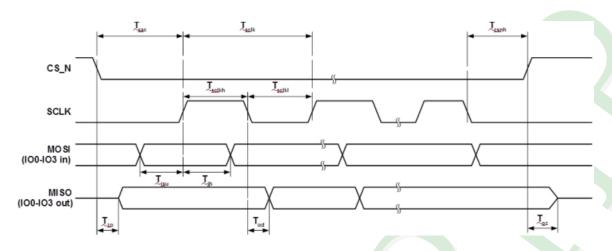
Pin#	Name	DESCRIPTION
1	GND	Ground.
2	VCC	Power Supply for Backlight Unit.
3	VCC	Power Supply for Backlight Unit.
4	NC	Not Used.
5	VDD	Power Supply.
6	GND	Ground.
7	NC	Not Used.
8	AUDIO_L	Audio PWM out
9	NC	Not Used.
10	SCLK	SPI SCK Signal.
11	MISO / IO1	SPI Single mode: SPI MISO output SPI Dual/Quad mode: SPI data line 1
12	MOSI / IO0	SPI Single mode: SPI MOSI input SPI Dual/Quad mode: SPI data line 0
13	CS_N	SPI slave select input
14	INT_N	Interrupt to host, open drain output(default) or push-pull output, active low
15	PD_N	Chip power down mode control input, active low.
16	GPIO0 / IO2	SPI Single/Dual mode: General purpose IO 0. SPI Quad mode: SPI data line 2.
17	GPIO1 / IO3	SPI Single/Dual mode: General purpose IO 1. SPI Quad mode: SPI data line 3.
18	FT813_GPIO2	Connect with FT813 GPIO 2 (pin 12)
19	FT813_GPIO3	Connect with FT813 GPIO 3 (pin 15)
20	GND	Ground.

REG_SPI_WIDTH[1:0]	Channel Mode	Data pins	Max bus speed
00	00 SINGLE – default mode MISO		30 MHz
01	01 DUAL IO0, IO1		30 MHz
10	QUAD	IO0, IO1, IO2, IO3	25 MHz
11	11 Reserved		-



2.3 Timing Characteristics

2.3.1 SPI Host interface

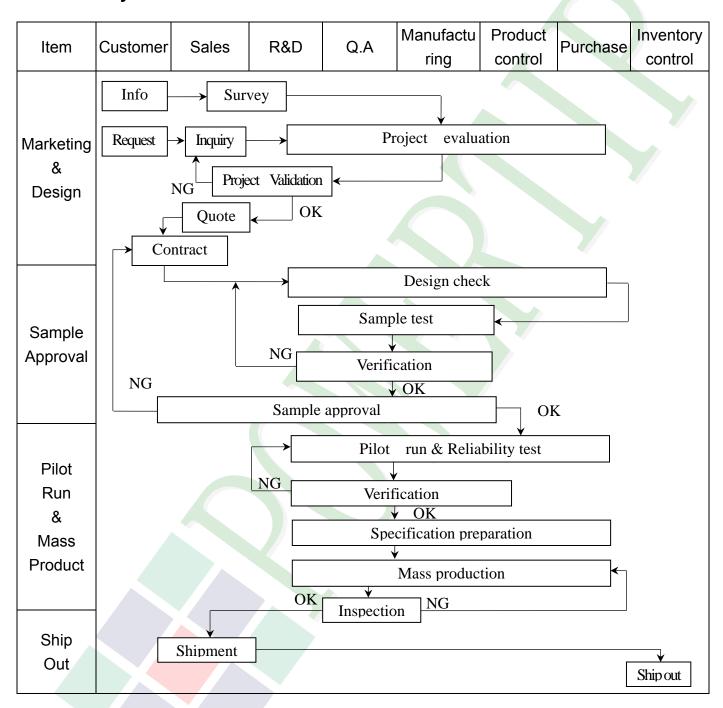


Parameter	Description	Min	Max	Units
Tsclk	SPI clock period (SINGLE/DUAL mode)	33.3		ns
Tsclk	SPI clock period (QUAD mode)	40		ns
Tsclkl	SPI clock low duration	13		ns
Tsclkh	SPI clock high duration	13		ns
Tsac	SPI access time	4		ns
Tisu	Input Setup	4		ns
Tih	Input Hold	0		ns
Tzo	Output enable delay		16	ns
Toz	Output disable delay		13	ns
Tod	Out <mark>put</mark> data delay		15	ns
Tcsnh	CSN hold time	0		ns

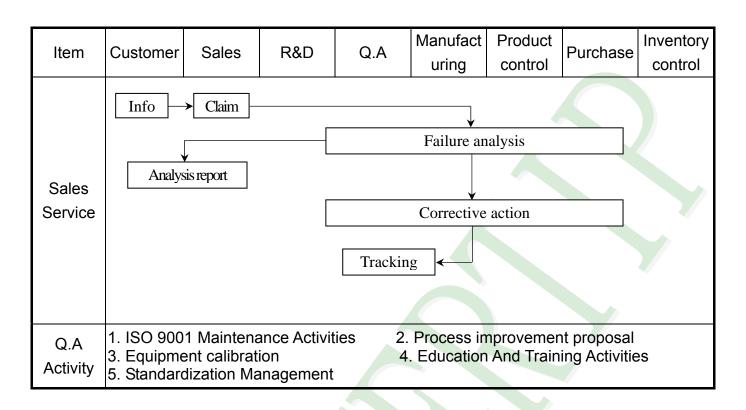


3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart









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

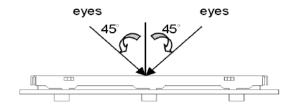
♦OUT Going Defect Level: Sampling.

◆Standard of the product appearance test:

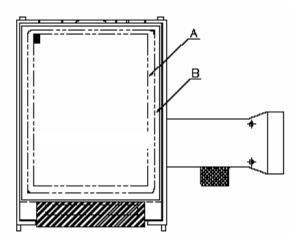
a. Manner of appearance test:

(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)



igspace Specification For TFT-LCD Module 3. 5" ~10":

NO	Item		Criterion					
		_	part nui duction.	mber is inconsistent	with work order of		Major	
01	Product condition	1. 2 Mixe	ed prod	uct types.			Major	
		1. 3 Asse	mbled i	n inverse direction.			Major	
02	Quantity	2. 1The o	2. 1The quantity is inconsistent with work order of production.					
03	Outline dimension		3. 1 Product dimension and structure must conform to structure diagram.					
		4. 1 Miss	sing line	character and icon	•		Major	
		4. 2 No function or no display.					Major	
04	Electrical Testing	4. 3 Display malfunction.					Major	
		4. 4 LCD viewing angle defect.					Major	
		4. 5 Current consumption exceeds product specifications.				Major		
				Item	Acceptance (Q'ty)			
	Dot defect			Bright Dot	≦ 4			
			Dot	Dark Dot	≦ 5			
	(Bright dot \		Defect	Joint Dot	≦ 3			
05	Dark dot)			Total	≦ 7		Minor	
	On -display	5. 1 Insp	ection]	pattern : full white	, full black , Red , Gree	n and		
	blue screens.							
	5. 2 It is defined as dot defect if defect area $>1/2$ dot.							
		5. 3 The	distance	e between two dot d	efect ≥5 mm.			



◆Specification For TFT-LCD Module 3. 5" ~10":

NO	Item		Criterion						
		6. 1 Round type	6. 1 Round type (Non-display or display):						
		Dimensio	(Нашеван : Д	Ac	ceptance (Q'ty)			
		Dimensio	n (diameter : Ф	A a	rea	B area			
	Black or white dot \ scratch \		$\Phi \le 0.25$	Ign	ore				
	contamination	0.25	$<\Phi \le 0.50$	5		-			
	Round type		$\Phi > 0.50$	0		Ignore			
	$X \leftarrow V$		Total	5	;				
06	$\Phi = (x+y)/2$ 6. Line type	6. 2 Line type(N	Jon-display or d	isplay) :			Minor		
			ength (L) Width (W)		Accepta				
		Length (L)			A area	B area			
			W	≤ 0.03	Ignore				
	→ L +	L ≦10.0	0.03 < W	≤ 0.05	4				
		L ≦5.0	0.05 < W	≤ 0.10	2	Ignore			
			W	>0.10	As round type	d			
			Total		5				
			(1)	Ac	ceptance (O'ty)			
		Dimension (diameter : Φ)	A ar		B area			
			$\Phi \leq 0.25$	Igno	ore				
07	Polarizer	0.25 <	$0.25~<~\Phi \leq 0.50$				Minor		
	Bubble	0.50 <	$\Phi \le 0.80$	1		Ignore			
			$\Phi > 0.80$	0					
		Т	otal	5					



◆Specification For TFT-LCD Module 3. 5" ~10":

NO	Item	Criterion			Level
08	The crack of glass	Z: The the triangle of	ngth of crack ickness of crack ickness of glass al glass chip: ip on panel surface and cra	ack between panels: Y SP [NG]	Minor
		X	Y	Z	
		≤ a	Crack can't enter viewing area	≦1/2 t	
		≤ a	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	



◆Specification For TFT-LCD Module 3. 5″ ~10″: (Ver.B01)

NO	Item	Criterion			
7,0		Symbols: X: The length of crack Z: The thickness of crack t: The thickness of glass 8. 1. 2 Corner crack:			ck.
		X	Y	Z	
		≤1/5 a	Crack can't enter viewing area	$\mathbf{Z} \leq 1/2 \mathbf{t}$	
		≤1/5 a	Crack can't exceed thalf of SP width.	the $1/2 t < Z \leq 2$	t
08	The crack of glass	8.2 Protrusion over terminal:			Minor
		8.2.1 Chip on electrode pad:			
		WY	Z	X Y W	ĮZ Ť
			X	Y Z	
		Front		$\leq 1/2 \mathrm{W} \qquad \leq t$	
		Back	$\leq a$	\leq W \leq 1/2	t



◆Specification For TFT-LCD Module 3. 5″ ~10″: (Ver.B01)

NO	Item	Criterion			
NO	Item	Symbols: X: The length of crack Z: The thickness of crack t: The thickness of glass 8. 2. 2 Non-conductive portion:			
08	The crack of glass	$\begin{array}{ c c c c c }\hline X & Y & Z \\ & \leq 1/3 \ a & \leq W & \leq t \\ \hline \hline \odot & If the chipped area touches the ITO terminal, over $2/3$ of the ITO must remain and be inspected according to electrode$	Minor		
		terminal specifications. 8. 2. 3 Glass remain:			
		$\begin{array}{c cccc} X & Y & Z \\ & \leq a & \leq 1/3 \text{ W} & \leq t \end{array}$			



◆Specification For TFT-LCD Module 3. 5" ~10":

NO	Item	Criterion	Level
	Backlight elements	9. 1 Backlight can't work normally.	Major
09		9. 2 Backlight doesn't light or color is wrong.	Major
		9. 3 Illumination source flickers when lit.	Major
	diagram.	10. 1 Pin type \ quantity \ dimension must match type in structure diagram.	Major
		10. 2 No short circuits in components on PCB or FPC .	Major
10	General	10. 3 Parts on PCB or FPC must be the same as on the production characteristic chart .There should be no wrong parts , missing parts or excess parts.	Major
10	appearance	10. 4 Product packaging must the same as specified on packaging specification sheet.	Minor
		10. 5 The folding and peeled off in polarizer are not acceptable.	Minor
		10. 6 The PCB or FPC between B/L assembled distance(PCB or FPC) is ≤1.5 mm.	Minor



4. RELIABILITY TEST

4.1 Reliability Test Condition

4.1	Reliability Test Condition (ver.but)					
NO.	TEST ITEM	TEST CONDITION				
1	High Temperature	Keep in +80 ±2°C 240 hrs				
1	Storage Test	Surrounding temperature, then storage at normal condition 4hrs.				
2	Low Temperature	Keep in -30 ±2°C 240 hrs				
	Storage Test	Surrounding temperature, then storage at normal condition 4hrs.				
	High Temperature /	-	C / 90% R.H duratio			
3	High Humidity	Surrounding temperature, then storage at normal condition 4hrs.				
	Storage Test	(Excluding th	ding the polarizer)			
			$-30^{\circ}\text{C} \rightarrow +25^{\circ}\text{C} -$			
4	Temperature Cycling Storage Test	(30mins) (5mins) (5mins)				
•		10 Cycle				
		Surrounding temperature, then storage at normal condition 4hrs.				
		Air Discharge	e:	Contact Discharge:		
		Apply 2 KV v	vith 5 times	Apply 250 V with 5 tin	ies	
		Discharge for	each polarity +/-	discharge for each pola	rity +/-	
	ESD Test	1. Temperature ambiance : 15° C \sim 35° C				
5		2. Humidity relative : 30%~60%				
		3. Energy Storage Capacitance(Cs+Cd): 150pF±10%				
		4. Discharge Resistance(Rd): 330 Ω±10%				
		5. Discharge, mode of operation:				
		Single Discharge (time between successive discharges at least 1 sec)				
		(Tolerance if the output voltage indication: ±5%)				
	Vibration Test (Packaged)		10∼55 Hz frequency	•		
6		2. The amplitude of vibration :1. 5 mm				
		3. Each direction (X \ Y \ Z) duration for 2 Hrs				
	Drop Test (Packaged)		Packing Weight (Kg)	Drop Height (cm)		
			0 ~ 45.4	122		
			45.4 ~ 90.8	76		
7			90.8 ~ 454	61		
			0ver 454	46		
		D. D. C.				
		Drop Direction	on :※1 corner / 3 edge	es / b sides each Itime		



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°C 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° C $\pm 5^{\circ}$ C 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.

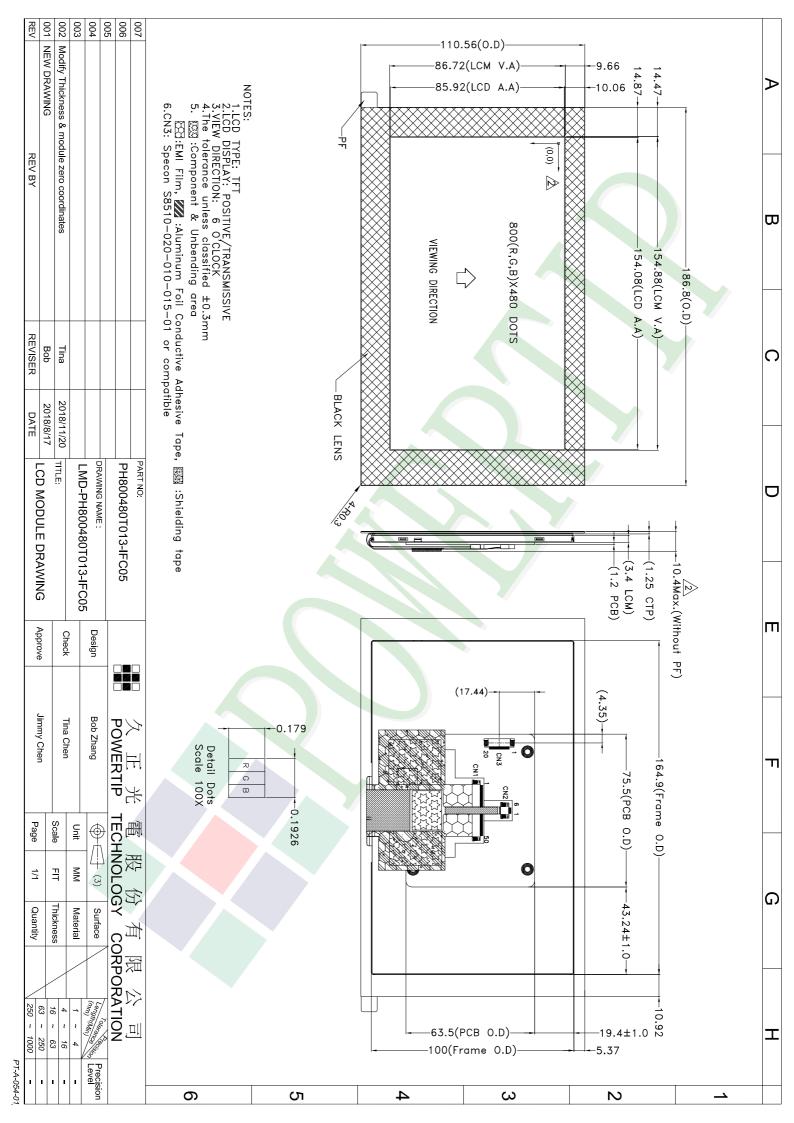
5.4 TERMS OF WARRANTY

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.



Ver.001 PKG-PH800480T013-IFC05 Documents NO. 3.單箱數量規格表 (Packaging Specifications and Quantity): (2)Total LCM quantity in carton: quantity per box

LCM包裝規格書 LCM Packaging Specifications

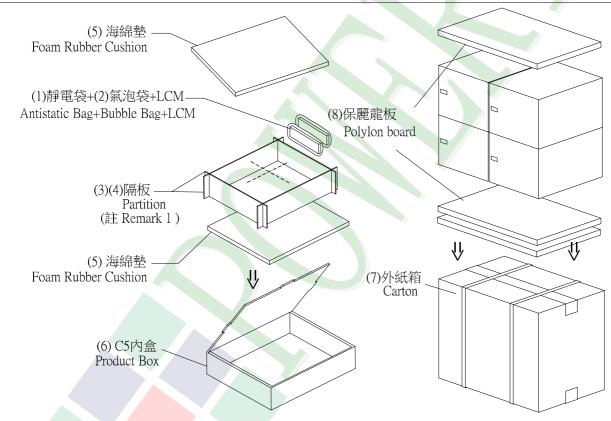
Approve	Check	Contact
Jimmy	Jimmy	Tina

60

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-IFC05	186.8 X 110.56	0.19	56	10.64
2	靜電袋(1)Antistatic Bag	BAG240170ARABA	240 X 170	0.0048	56	0.2688
3	氣泡袋(2)Bubble Bag	BAG170150BRABA	170 X 150	0.0045	56	0.252
4	A9隔板(3)A9 Partition	BX0000000058	245 X 125 X 4	0.0204	36	0.7344
5	B9隔板(4)B9 Partition	BX00000000057	295 X 125 X 4	0.0209	8	0.1672
6	海綿墊(5)Foam Rubber Cushion	OTFOAM00006ABA	290 X 240 X 10	0.02	8	0.16
7	C5内盒(6)Product Box	BX00000000059	310 X 255 X 155	0.248	4	0.992
8	外紙箱(7)Carton	BX52732536CCBA	527 X 325 X 360	0.83	1	0.83
9	保麗龍板(8)Polylon board	OTPLB00000017	510 X 310 X 15	0.025	3	0.075

- 2.一 整箱總重量 (Total LCD Weight in carton): 14.12 Kg±10%
- (1)Quantity Of Spacer: A9隔板 X 9 , B9隔板 X 2
- x no of boxes



特 記 事 項 (REMARK)

- 4. LCM排放示意圖(前後間隔不放置):
- 4. LCM placed as figure showing: (First and last slot should be empty)

