S	SPECIFICATIONS					
CUSTOMER	:					
SAMPLE CODE	:	SH128800T003-ZGC				
MASS PRODUCTION CODE	:	PH128800T003-ZGC				
SAMPLE VERSION	:	01				

SPECIFICATIONS EDITION 002

DRAWING NO. (Ver.) LMD-PH128800T003-ZGC (Ver.002)

PACKAGING NO. (Ver.) PKG-PH128800T003-ZGC (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
黄秋源	石建莊	黄俊清
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Preliminary specification for design input

Specification for sample approval

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History of Version

Date	Ver.	Edi.	Description	Page	Design by
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02/17/2017	01	002	New Sample.	-	Ackey
					2/
				<i></i>	

Total: 26 Page



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Appendix : LCM drawing.

LCM Packaging Specifications.



1. SPECIFICATIONS

1.1 Features

Item	Standard Value				
Screen size(inch)	12.1(Diagonal)				
Resolution	1280* (R · G · B) * 800 Dots				
Display mode	Normally Black				
Touch panel	Projective Capacitive Touch Panel				
Touch panel	10 Points touch				
Surface treatment	AG type,3H hard coating				
Color arrangement	RGB-stripe				
Weight	930 g				
Interface	LVDS				
	THIS PRODUCT CONFORMS THE ROHS OF PTC				
ROHS	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	305.0(W) * 200.0 (L) * 14.05 (H)	mm

LCD panel

Item	Standard Value	Unit
Active Area	261.12 (W) * 163.2 (L)	mm

Note: For detailed information please refer to LCM drawing.



1.3 Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit	Note
Power Supply Voltage	VCC	-0.3	+4.0	V	-
Operating Temperature	TOP	-20	+70	$^{\circ}\mathbb{C}$	(1)
Storage Temperature	T _{ST}	-30	+80	$^{\circ}$ C	(1)(2)

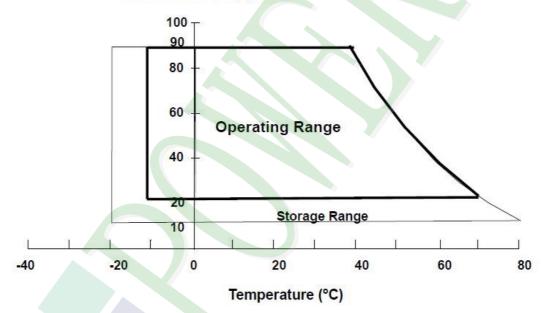
Note 1:

- (a) 90%RH Max. (Ta<=40°ℂ)
- (b) Wet-bulb temperature should be 39° C Max. (Ta> 40° C).
- (c) No condensation.

Note 2:

The temperature of panel surface should be -10°C min. and 70°C max.

Relative Humidity (%RH)





1.4 DC Electrical Characteristics

Item	Symbol	Condition	Min.	Тур.	Max.	Unit	Note
Power Supply Voltage	VCC	-	3.0	3.3	3.6	٧	-
Power Supply Voltage							
	VLED	-	9.0	12.0	15.0	V	
For Led Driver							
Cumply Current	IDD	VDD=3.3V		0.5	0.75	^	(1)
Supply Current	טטו	Pattern= Picture	_	0.5	0.75	Α	(1)

Note1: Maximum current display.



1.5 Optical Characteristics

TFT LCD Panel Ta=25 ℃

Item		Symbol	Condition	Min.	Тур.	Max.	Unit	-
Posponso tin	20	Tr		-	15	20	me	Note2
Response time		Tf	-	-	10	15	ms	Notez
	Тор	ΘΥ+		80	88	-		
Viewing angle	Bottom	ΘΥ-	CR≥10	80	88	-	Deg.	Note4
viewing angle	Left	ΘХ-	ON 2 10	80	88	-	Deg.	110164
	Right	ΘХ+		80	88	-		
Contrast rati	0	CR		800	1000	-	-	Note3
	White	X		0.25	0.30	0.35		
		Υ		0.29	0.34	0.39	-	
0-1	Red	X		0.54	0.59	0.64		
Color of CIE Coordinate	1160	Υ	-	0.30	0.35	0.40		Note1
(With B/L)	Green	Χ		0.28	0.33	0.38		
	GICCII	Υ		0.52	0.57	0.62		
	Blue	X		0.09	0.14	0.19		
	Dide	Y		0.05	0.10	0.15		
Average Brighti Pattern=white di		IV	-	800	-	-	cd/m2	Note1
Luminance unifo	ormity	YU	-	75	-	-	%	Note1



Note1:

 $1 : \triangle B=B(min) / B(max) \times 100\%$

2 : Measurement Condition for Optical Characteristics:

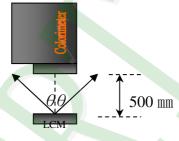
a : Environment: 25°C±5°C / 60±20%R.H, no wind, dark room below 10 Lux at typical lamp current and typical operating frequency.

b : Measurement Distance: 500 \pm 50 mm \rightarrow (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%



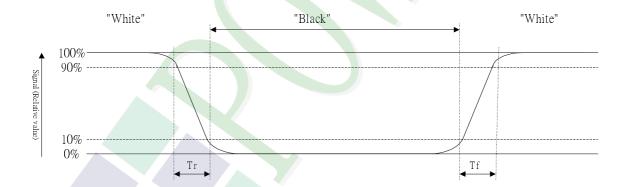


Colorimeter=BM-7 fast

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:



Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

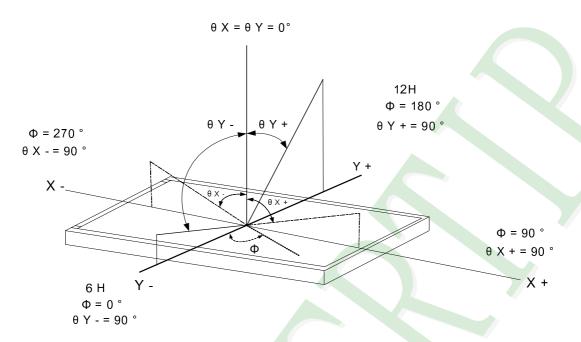
Photo detector output when LCD is at "White" state

Contrast ratio (CR) =

Photo detector output when LCD is at "Black" state



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





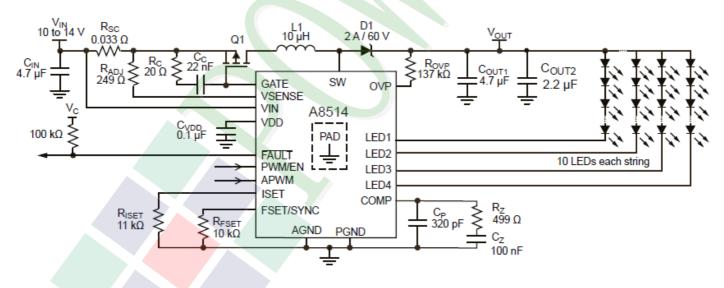
1.6 Backlight Characteristics

Electrical / Optical Characteristics

·							
ltem		Symbol	Min.	Тур.	Max.	Unit	Note
Backlight Power		VLED	9.0	12.0	15.0	V	T- 0F-9C
Backlight Power		ILED	-	1.0	1.5	Α	Ta = 25 ℃
LED Driver output Voltage		VF	26.0	28.0	30.0	V	
LED Driver output Current		IF	-	400		mA	-
EN Signal Voltage	High	PWM/EN	1.5	- (-	V	
EN Signal Voltage	Low		-	-	0.4	V	-
PWM Frequency		PWM/EN	60	120	140	KHz	*1)
Lifetime		-	50000		1	Hr	*2)
Color				White			-

^{*1)} PWM/EN = 5 V

^{*2)} Definition of the LED life time: Luminance (L) under 50% of the initial value. LED life time is restricted under normal condition, ambient temperature= $25\,^{\circ}$ C



LED channels: 4

Series LEDs per channel: 10



1.7 Touch Panel Characteristics

Features

Item	Standard Value
Touch Panel Size	12.1
Touch type	Projective capacitive touch panel
Input Method	Finger / 10 Points touch
Output Interface	USB

Mechanical Specifications

Item	Standard Value	Unit
Viewing Area	262.6 (W) * 164.7 (L)	mm

Absolute Maximum Ratings

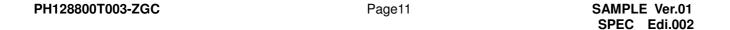
Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	VBUS	-	-0.3	+6.0	٧
Operating Temperature	Top	-	-20	+70	°C
Storage Temperature	T _{ST}	-	-30	+80	∞

DC Electrical Characteristics

Item	Symbol	Condition	Min.	Тур.	Max.	Unit
Power Supply Voltage	VBUS	-	-	5.0	-	V

Touch Panel IC Read/Write description & Register Mapping

Reference :ILITEK Touch Driver Porting Reference Guide.





2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram





2.2 Interface Pin Description

CN1

Pin No.	Symbol	Description
1	NC	Not Connection.
2	NC	Not Connection.
3	NC	Not Connection.
4	NC	Not Connection.
5	NC	Not Connection.
6	NC	Not Connection.
7	GND	Ground.
8	GND	Ground.
9	VCC	Power supply: +3.3V.
10	VCC	Power supply: +3.3V.
11	GND	Ground.
12	GND	Ground.
13	RX0-	Negative transmission data of pixel 0.
14	RX0+	Positive transmission data of pixel 0.
15	GND	Ground.
16	RX1-	Negative transmission data of pixel 1.
17	RX1+	Positive transmission data of pixel 1.
18	GND	Ground.
19	RX2-	Negative transmission data of pixel 2.
20	RX2+	Positive transmission data of pixel 2.
21	GND	Ground.
22	RXCLK-	Negative of clock.
23	RXCLK+	Positive of clock.
24	GND	Ground.
25	RX3-	Negative transmission data of pixel 3.
26	RX3+	Positive transmission data of pixel 3.



Pin No.	Symbol	Description
27	GND	Ground.
28	SEL 6/8	LVDS 6/8 bit select function control. Low or NC → 6bit Input Mode. High → 8bit Input Mode.
29	GND	Ground.
30	GND	Ground.

CTP Board Interface Pin Description

CN2

Pin No.	Symbol	Description
1	VBUS	Power Supply.(5V)
2	DATA-D-	Differential Signal D-
3	DATA -D+	Differential Signal D+
4	GND	Ground.
5	NC	Not Connection.
6	RESET	Chip Reset Input, Negative Edge Trigger (3.3V)

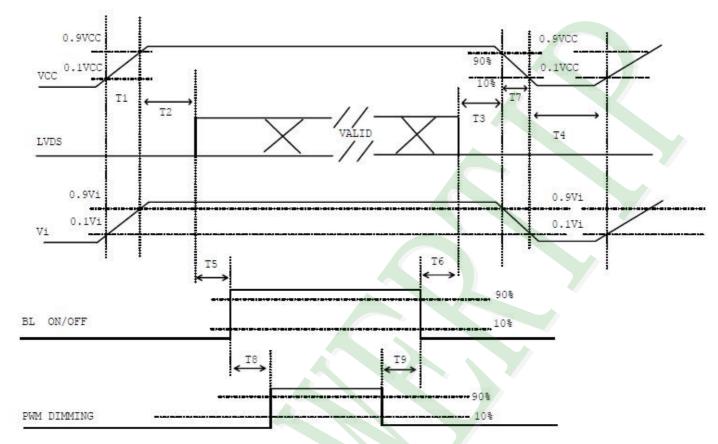
CN3: Backlight

Pin No.	Symbol	Description
1	VLED	Power Supply.(+12.0V)
2	VLED	Power Supply. (+12.0V)
3	EN/PWM	LED Enable Pin. (Active Hi). PWM dimming pin, used to control the LED intensity by using pulse width modulation. Also used to enable the A8514.
4	NC	No Connection.
5	GND	Ground.
6	GND	Ground.



2.3 Timing Characteristics

2.3.1 POWER ON/OFF SEQUENCE

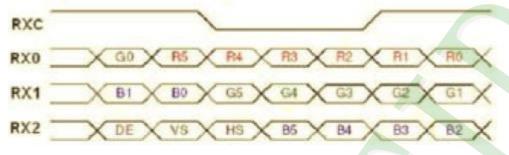




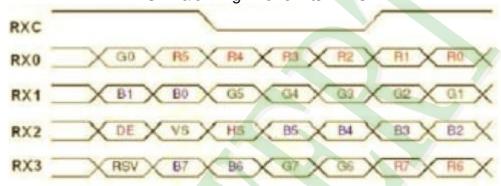


LVDS Data Input Format





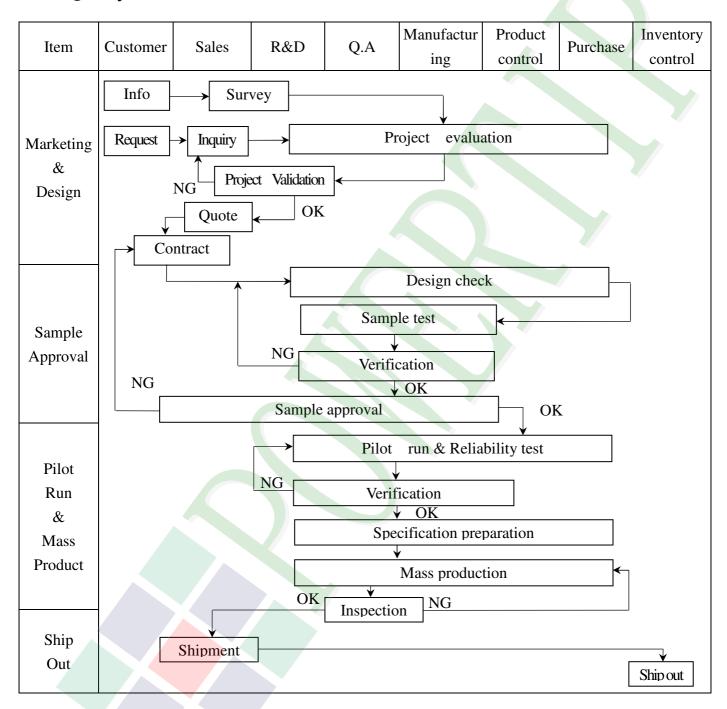
SEL 6/8="High" for 8 Bits LVDS



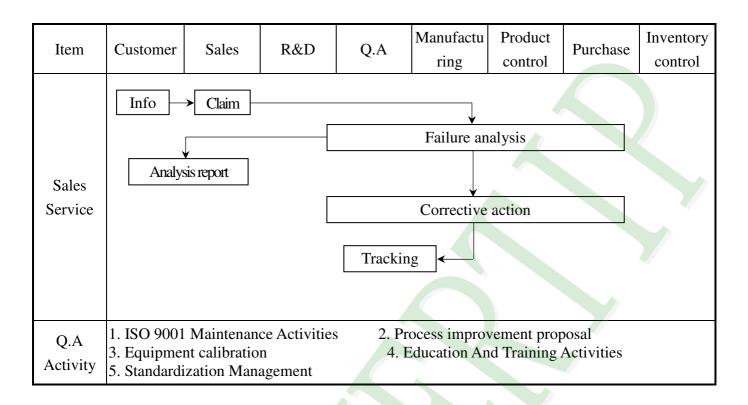


3. QUALITY ASSURANCE SYSTEM

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.

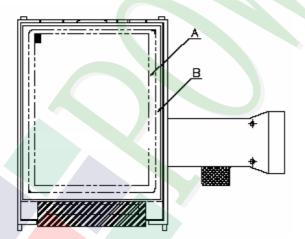
◆Standard of the product appearance test:

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)

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

NO	Item	Criterion		
		1. 1The part number is inconsistent with work order of production.	Major	
01	Product condition	1. 2 Mixed product types.	Major	
		1. 3 Assembled in inverse direction.	Major	
02	Quantity	2. 1The quantity is inconsistent with work order of production.	Major	
03	Outline dimension	3. 1 Product dimension and structure must conform to structure diagram.	Major	
		4. 1 Missing line character and icon.	Major	
	Electrical Testing	4. 2 No function or no display.	Major	
04		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 defect	Dot Dark Dot ≤ 5		
05	(Bright dot \	Defect Joint Dot ≤ 3		
	Dark dot) On -display 5.	Total ≤ 7	Minor	
		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.		



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

NO	Item	Criterion	Level
		6. 1 Round type (Non-display or display):	
		Dimension (diameter : Φ) Acceptance (Q'ty) A area B area	
	Black or white dot \(\) scratch \(\)	$\Phi \le 0.25$ Ignore	
	contamination	$0.25 < \Phi \leq 0.50$ 5 Ignore	
	Round type	$\Phi > 0.50$	
	Y	Total 5	
06	$\Phi = (x+y)/2$	6. 2 Line type(Non-display or display) :	Minor
	(X + 3) / 2	Length (L) Width (W) Acceptance (Q'ty)	
	Line type	A area B area	
	→ V W	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	L	$L \leq 5.0 \qquad 0.05 < W \leq 0.10 \qquad \qquad 2 \qquad \qquad Ignore$	
		W >0.10 As round type	
		Total 5	
		Dimension (diameter : Φ) Acceptance (Q'ty)	
07		$\Phi \le 0.25$ Ignore B area	
	Polarizer Bubble	$0.25 < \Phi \leq 0.50$	Minor
		$0.50 < \Phi \leq 0.80$ 1 Ignore	14111101
		$\Phi > 0.80$	
		Total 5	



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

NO	Item	Criterion		Level
08	The crack of glass	Symbols: X: The length of crack Z: The thickness of crack	Y: The width of crack. V: terminal length a: LCD side length ck between panels: Y SP [NG]	Minor
		Seal width Z	Y	
		X Y ≤ a Crack can't enter viewing area	Z ≤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":

Symbols: X: The length of crack Z: The thickness of crack T: The thickness of glass 8. 1. 2 Corner crack: $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	NO	Item	Criterion		
$X \qquad Y \qquad Z \\ \leq 1/5 \ a \qquad \text{Crack can't enter viewing area} \qquad Z \leq 1/2 \ t \\ \leq 1/5 \ a \qquad \text{Crack can't exceed the half of SP width.} \qquad 1/2 \ t < Z \leq 2 \ t \\ 8. \ 2 \ \text{Protrusion over terminal:} \\ 8. \ 2. \ 1 \ \text{Chip on electrode pad:} \\ \hline X \qquad Y \qquad Z \\ \hline X \qquad Y \qquad Z \\ \hline Front \qquad \leq a \qquad \leq 1/2 \ W \qquad \leq t \\ \hline$			X: The length of crack Z: The thickness of crack W: terminal length		
			8.1.2 Corner crack:		
viewing area $\leq 1/5$ a Viewing area $\leq 1/5$ a Crack can't exceed the half of SP width. $1/2$ t $<$ Z ≤ 2 t $\leq 1/5$ a S. 2 Protrusion over terminal: 8. 2. 1 Chip on electrode pad: $\leq 1/5$ X Y Z $\leq 1/5$ Y $\leq 1/5$ Front $\leq 1/5$ X Y Z $\leq 1/5$ Y $\geq 1/5$ Y \geq			X Y Z		
The crack of glass 8. 2 Protrusion over terminal: 8. 2. 1 Chip on electrode pad: X X X X X X X X					
8. 2. 1 Chip on electrode pad: X Y					
8. 2. 1 Chip on electrode pad: X Y Y X Y	ng.	The exact of glass		Minor	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	00	The crack of glass		WHITE	
Front $\leq a$ $\leq 1/2 \mathrm{W}$ $\leq t$			X X Y Z		
Front $\leq a \leq 1/2 \mathrm{W} \leq t$			X		
			$\begin{array}{ c c c c c } \hline Back & \leq a & \leq W & \leq 1/2 t \\ \hline \end{array}$		



♦ Specification For TFT-LCD Module 3. 5'' ~10'':

NO	Item	Criterion		
NO 08	The crack of glass	Symbols: X: The length of crack Z: The thickness of crack t: The thickness of glass 8. 2. 2 Non-conductive portion: X X X X X X X X X X X X X	Level	



4. RELIABILITY TEST

4.1 Reliability Test Condition

4.	neliability rest collution , , ,			
NO.	TEST ITEM	TEST CONDITION		
1	High Temperature Storage Test	Keep in +80 ±2°C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.		
2	Low Temperature Storage Test	Keep in −30 ±2°C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.		
3	High Temperature / High Humidity Storage Test	Keep in +60°C / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)		
4	Temperature Cycling Storage Test	$-30^{\circ} C \rightarrow +25^{\circ} C \rightarrow +80^{\circ} C \rightarrow +25^{\circ} C$ $(30 \text{mins}) (5 \text{mins}) (5 \text{mins})$ 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 +/- 1. Temperature ambiance: $15^{\circ} \sim 35^{\circ} \sim 35^$		
6	Vibration Test (Packaged)	 Sine wave 10~55 Hz frequency (1 min) The amplitude of vibration :1. 5 mm Each direction (X \cdot Y \cdot Z) duration for 2 Hrs 		
7	Drop Test (Packaged)	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 1 times		



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.

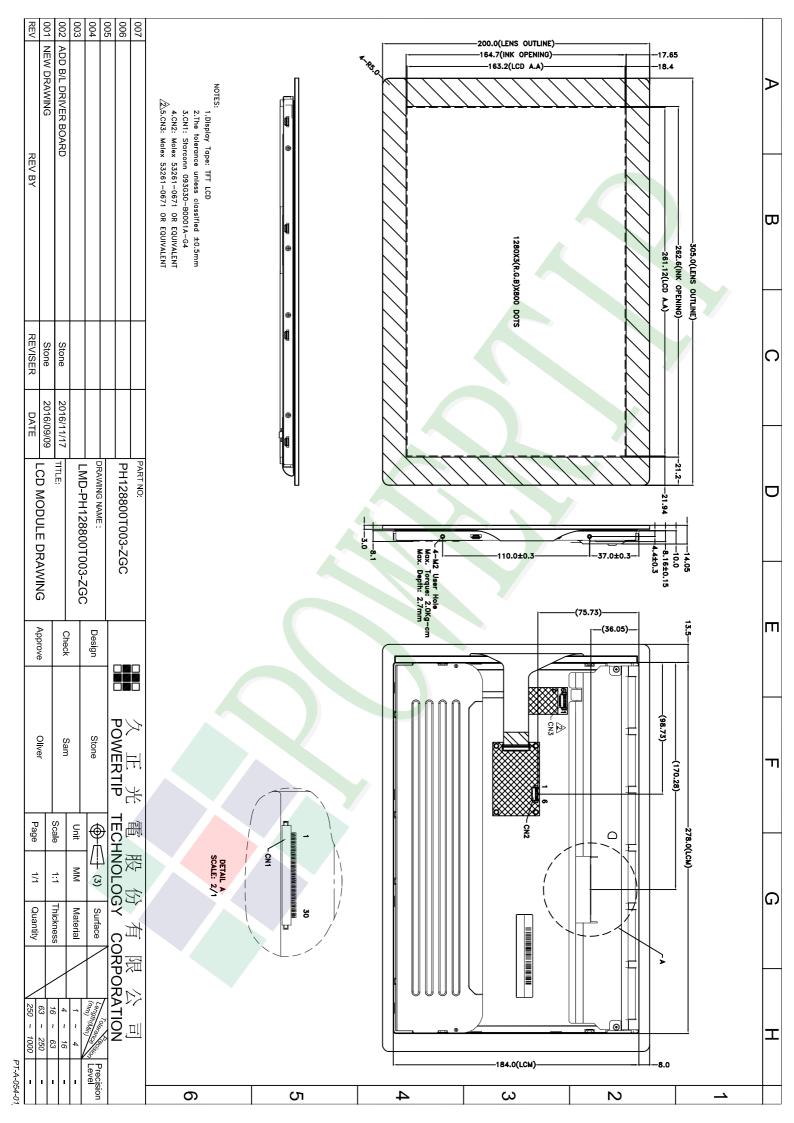
5.4 TERMS OF WARRANTY

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.



Approve Check Contact LCM包裝規格書 Ver.001 LCM Packaging Specifications Oliver Sam Stone Documents NO. PKG-PH128800T003-ZGC 1.包裝材料規格表 (Packaging Material): (per carton) No. Item Model Dimensions (mm) 1Pcs Weight Total Weight Quantity 1 成品 (LCM) 305.0 X 200.0 18 PH128800T003-ZGC 0.93 16.74 2 靜電袋(1)Antistatic Bag 18 3 上蓋(2)EPE(Cover) 510 X 355 X 55 FOAM000000197 0.16 1 0.16 下座(3)EPE(Bottom) 510 X 355 X 100 0.34 4 1 0.34 FOAM000000198 BX53537327CCBA 5 外紙箱(4)Carton 535 X 373 X 265 1.1624 1.1624 6 2.一 整箱總重量 (Total LCD Weight in carton): 18.4 Kg±10% 3.單箱數量規格表 (Packaging Specifications and Quantity): Total LCM quantity in carton: quantity per EPE x no of EPE 18 (2)上蓋 仆 EPE(Cover) (1)靜電袋+LCM -仆 Antistatic Bag+LCM (3)下座 EPE(Bottom) (4)外紙箱 Carton 特 記 事 項 (REMARK) 4. 使用供應商原包裝靜電袋。