



## SPECIFICATIONS

CUSTOMER	:	_____
SAMPLE CODE	:	SH102768T001-ZAA
MASS PRODUCTION CODE	:	PH102768T001-ZAA
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	003
DRAWING NO. (Ver.)	:	LMD- PH102768T001-ZAA (Ver.002)
PACKAGING NO. (Ver.)	:	PKG- PH102768T001-ZAA (Ver.001)

<b>Customer Approved</b>
<div style="text-align: right; margin-top: 20px;"><b>Date:</b></div>

Approved	Checked	Designer
黃秋源 <b>Oliver Huang</b>	黃秋源 <b>Oliver Huang</b>	李健弘 <b>Lambert Lee</b>

- Preliminary specification for design input
- Specification for sample approval

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Appendix : LCM Drawing  
Packaging

## 1.1 Features

Item	Standard Value
Screen size(inch)	12.1 inch
Display Type	1024 * (RGB) * 768
LCD Type	Normally white
Touch panel	---
Color configuration	R.G.B. Vertical Stripe
Backlight Type	LED B/L
Weight	545 g(max)
Interface	LVDS
Support Color	16.7M
Surface Treatment	Anti-glare & hardness 3H
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : <a href="http://www.powertip.com.tw/news.php?area_id_view=1085560481/">http://www.powertip.com.tw/news.php?area_id_view=1085560481/</a>

## 1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	279.0 (W) * 209.0 (L) * 9.0 (H)	mm

### LCD panel

Item	Standard Value	Unit
Active Area	245.76 (W) * 184.32 (L)	mm

Note : For detailed information please refer to LCM drawing

### 1.3 Absolute Maximum Ratings

#### Module

Item	Symbol	Min.	Max.	Unit	Condition
Input power supply	VDD	-0.5	+5.0	V	(1)
Operating Temperature	T <sub>OP</sub>	-20	+70	°C	(1)(2)(3)(4)
Operating Humidity	H <sub>OP</sub>	10	85	%RH	-
Storage Temperature	T <sub>ST</sub>	-30	+80	°C	-
Storage Humidity	H <sub>ST</sub>	10	95	%RH	-

Note (1): Humidity: 85%RH Max. (T≤40 °C ) Note static electricity

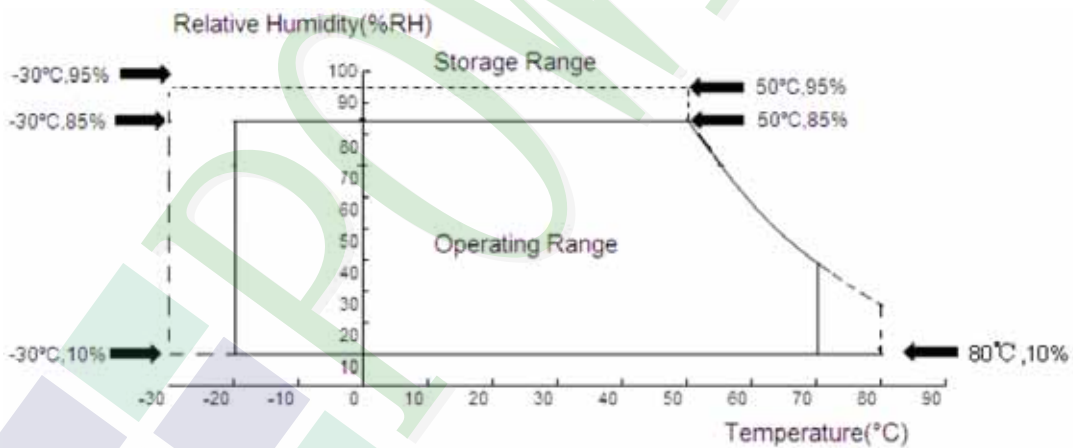
Maximum wet bulb temperature at 39 °C or less. (T>40 °C ) No condensation

Note (2): There is a possibility of causing deterioration in the irregularity and others of the screen and the display fineness though the liquid crystal module doesn't arrive at destruction when using it at 80~85 °C or -20 °C .

Note (3): There is a possibility of causing the fineness deterioration by the prolonged use in the (high temperature) humidity environment (60% or more).

Note (4): In the operating temperature item, the low temperature side is the ambient temperature regulations. The high temperature side is the panel surface temperature regulations.

Note (5): Storage Range & Operating Range Picture:

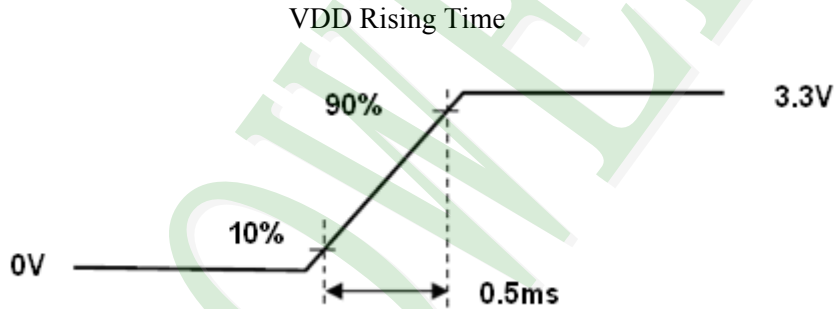


## 1.4 DC Electrical Characteristics

### TFT LCD Module

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply	VDD	Note (2)(4)	3.0	3.3	3.6	V
VDD Current	IDD	VDD =3.3V Black Pattern Note (3)(4)	-	-	250	mA
VDD Power Consumption	PDD	VDD =3.3V Black Pattern Note (3)(4)	-	-	0.825	W
Rush Current	Irush	Note (1)(4)	-	-	3	A
Allowable Logic/LCD Drive Ripple Voltage	VDDrp	Note (4)	-	-	200	mV

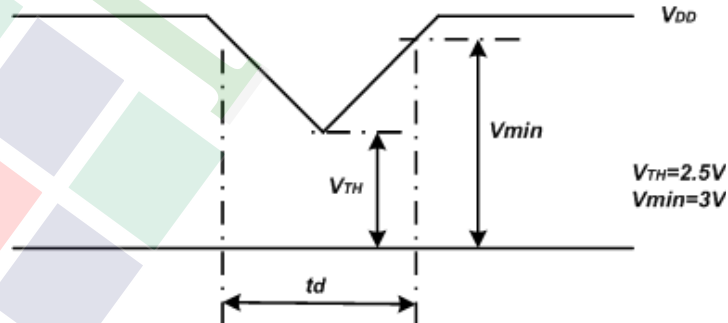
**Note (1):** Measure Condition



**Note : (2)** VDD Power Dip Condition

If  $V_{TH} < VDD \leq V_{min}$  , then  $t_d \leq 10ms$  ; When the voltage returns to normal our panel must revive automatically.

15 VDD Power Dip



Note (3) Frame Rate=60Hz, VDD=3.3V,DC Current.

Note (4) Operating temperature 25°C , humidity 55%RH

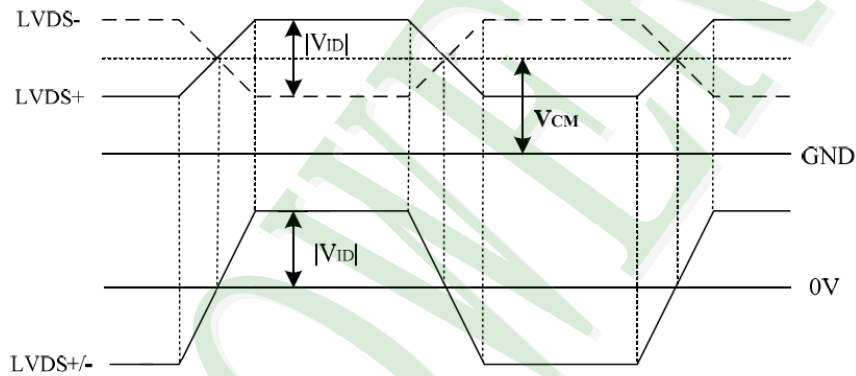
### Switching Characteristics for LVDS Receiver

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Differential Input High Threshold	Vth	V <sub>CM</sub> =+1.2V	-	-	+100	mV
Differential Input Low Threshold	Vtl	V <sub>CM</sub> =+1.2V	-100	-	-	mV
Magnitude Differential Input Voltage	V <sub>ID</sub>	-	100	-	600	mV
Common Mode Voltage	V <sub>CM</sub>	-	V <sub>ID</sub>  /2+0.6	1.2	1.8- V <sub>ID</sub>  /2	V
Common Mode Voltage Offset	ΔV <sub>CM</sub>	V <sub>CM</sub> =+1.2V	-	-	50	mV

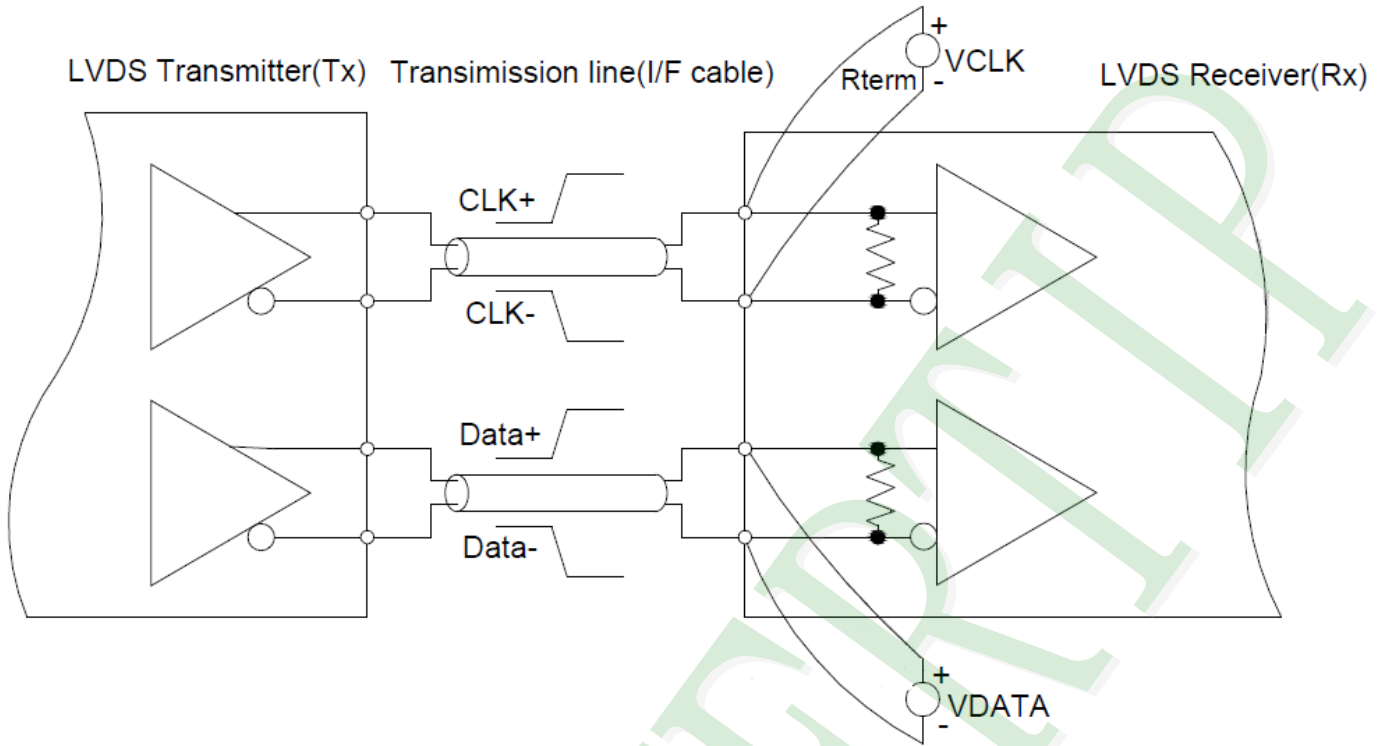
Note: (1) Input signals shall be low or Hi-resistance state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

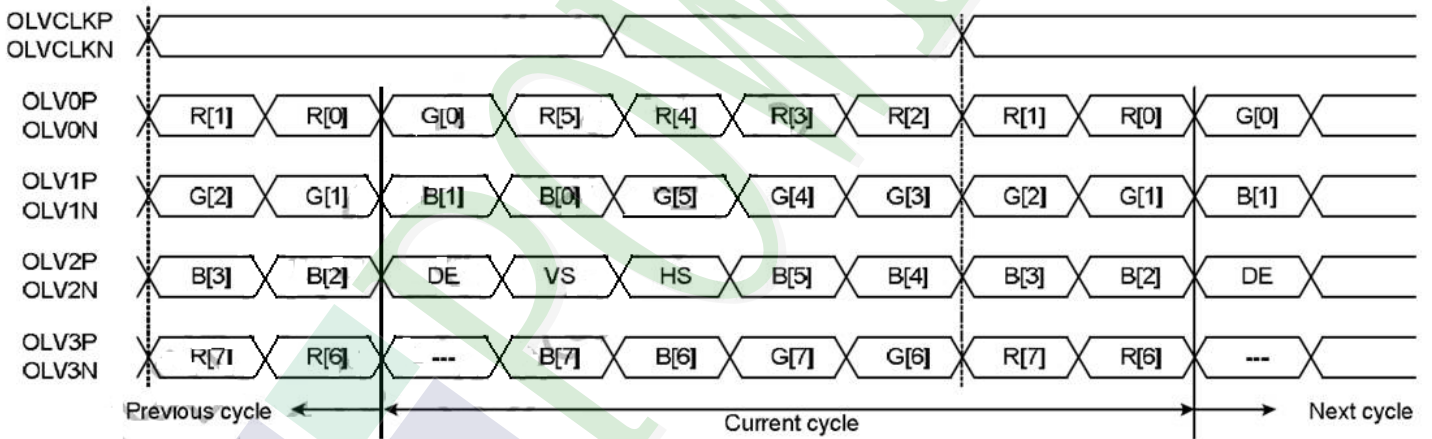
#### Voltage Definitions



### Measurement System



### Data Mapping





## 1.5 Optical Characteristics

### TFT LCD Panel

Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	unit	
Response time	Rise	Tr+Tf	Ta = 25°C θX, θY = 0°	-	16	-	ms	Note2
Viewing angle (With B/L on / With 3D-LCD barrier off)	Top	θY+	CR ≥ 10	70	80	-	Deg.	Note4
	Bottom	θY-		70	80	-		
	Left	θX-		70	80	-		
	Right	θX+		70	80	-		
Contrast ratio		CR		720	800	-	-	-
Color of CIE Coordinate	White	X	Ta = 25°C θX, θY = 0°	0.255	(0.305)	0.355	-	Note1
		Y		0.275	(0.325)	0.375		
	Red	X		-	TBD	-		
		Y		-	TBD	-		
	Green	X		-	TBD	-		
		Y		-	TBD	-		
	Blue	X		-	TBD	-		
		Y		-	TBD	-		
Average Brightness Pattern=white display		IV	TBD	315	350	-	cd/m <sup>2</sup>	Note1
Uniformity		△B	TBD	70	-	-	%	Note1

Note1:

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

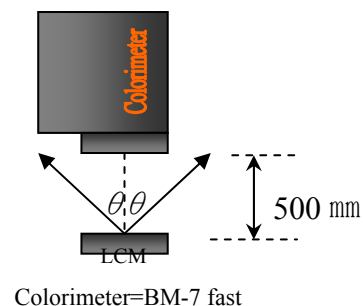
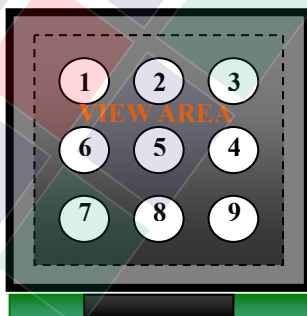
2 : Measurement Condition for Optical Characteristics:

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 ± 50 mm , (θ= 0°)

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

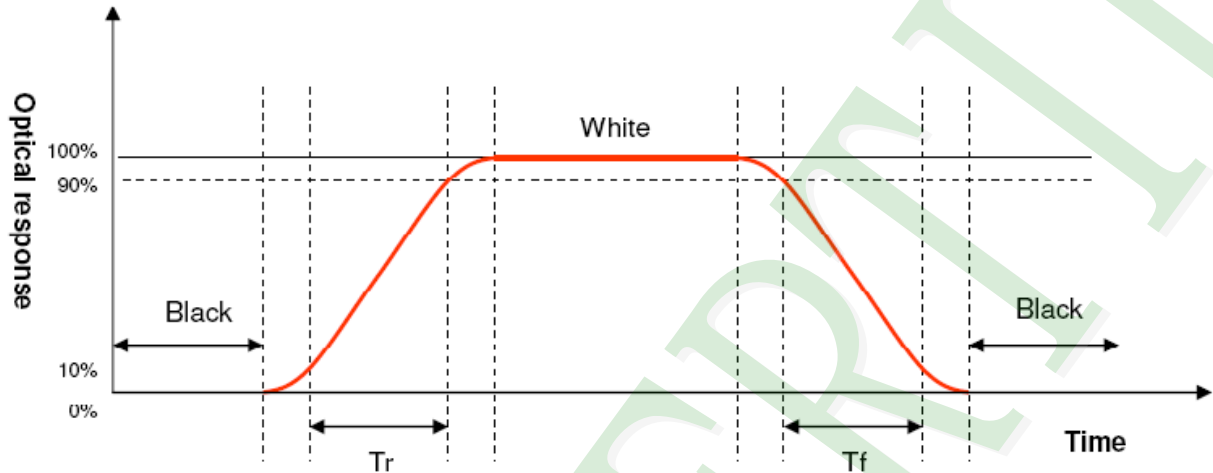
d : The uncertainty of the C.I.E coordinate measurement ±0.01 , Average Brightness ± 4%



Note2: Definition of response time:

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

Refer to figure as below:



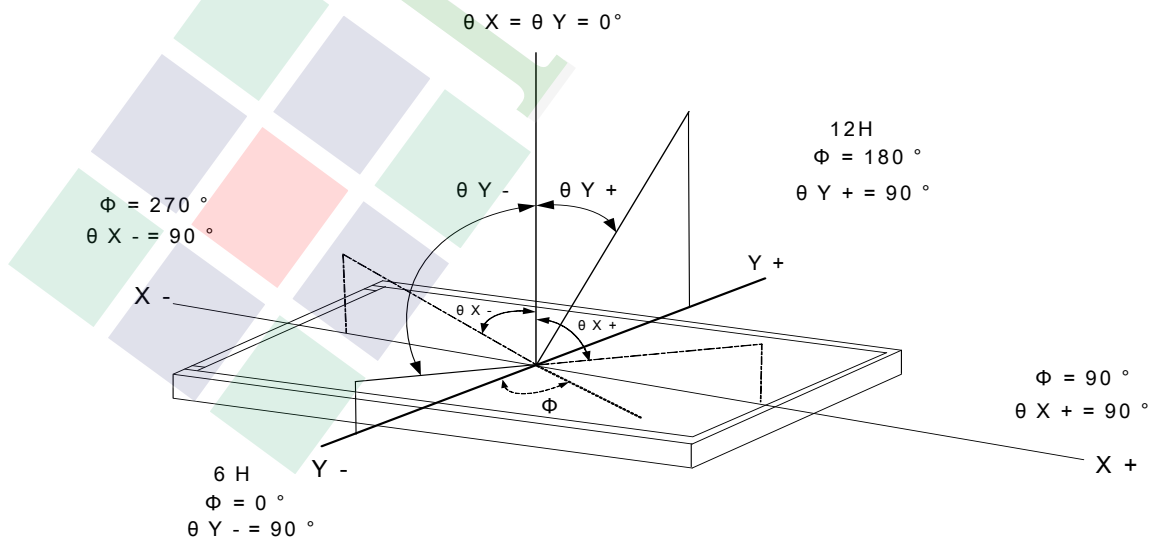
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

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

Note4: Definition of viewing angle:

Refer to figure as below:



## 1.6 Backlight Characteristics

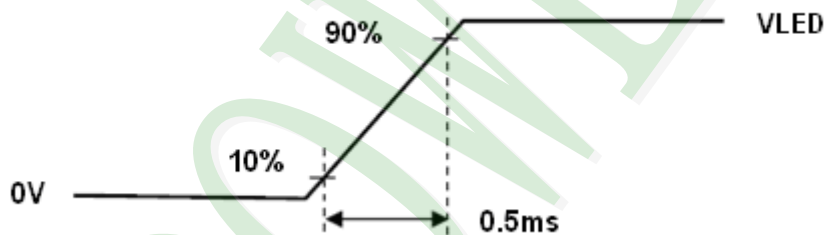
Item	Symbol	Min.	Typ.	Max.	Units	Condition
LED Voltage	V <sub>L</sub>	10.8	12	12.6	V	Ta=25°C
LED Current	I <sub>L</sub>	-	240	-	m A	
LED Forward Voltage	V <sub>F</sub>	2.8	3.3	3.6	V	
LED Forward Current	I <sub>F</sub>	-	60	-	m A	
BL Power Consumption	P <sub>L</sub>	-	-	6.1	W	
LED Life Time	-	(30,000)	-	-	Hours	Ta=25°C/I <sub>L</sub> =240mA Note (1)

Note (1) The LED life time define as the estimated time to 50% degradation of initial luminous.

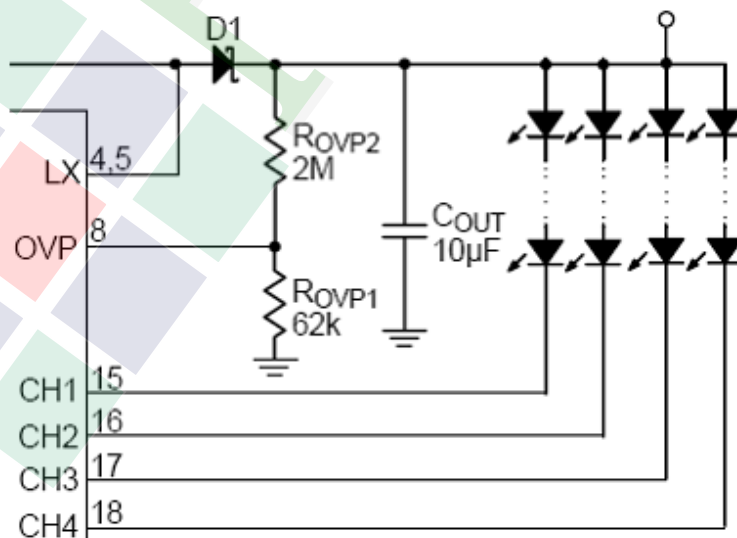
Note (2) Operating temperature 25 °C , humidity 55%RH.

Note (3) A higher LED power supply voltage will result in better power efficiency. Keep the V<sub>LED</sub> between 12V and 12.6V is strongly recommended.

LED Rush Current Measure Condition



LED Circuit Diagram



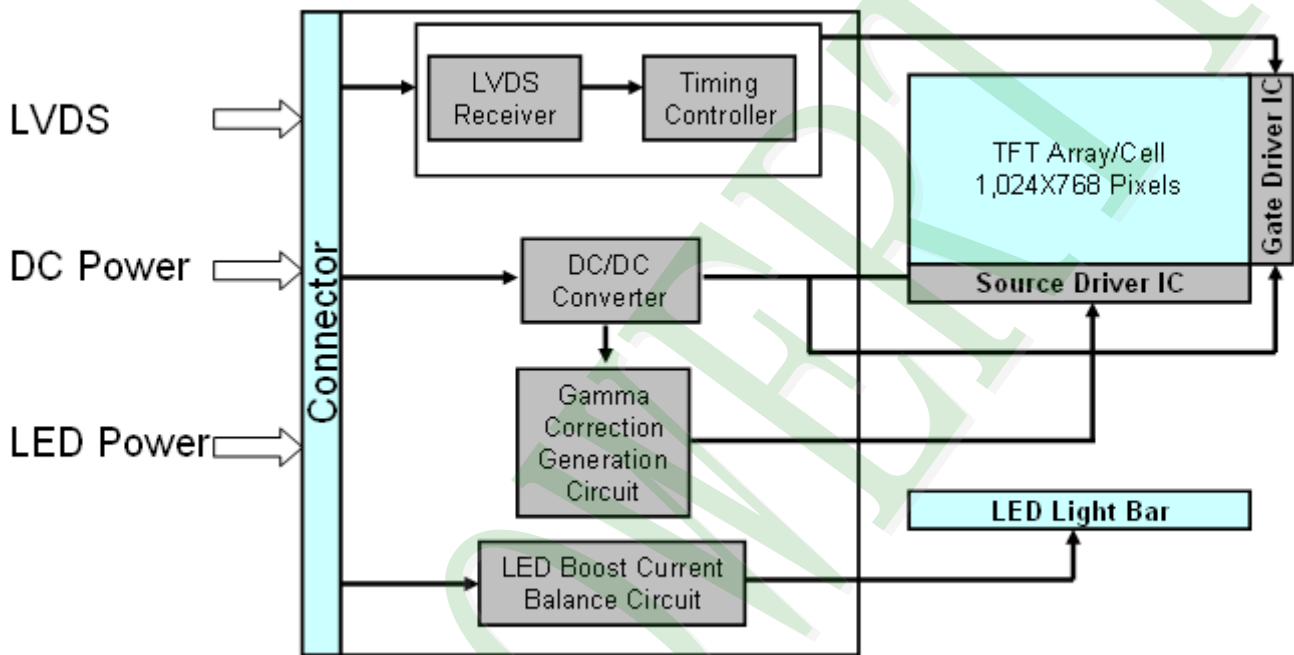
## 2. MODULE STRUCTURE

### 2.1 Counter Drawing

#### 2.1.1 LCM Mechanical Diagram

\* See Appendix

#### 2.1.2 Block Diagram



## 2.2 Interface Pin Description

### LVDS

Pin No.	Symbol	Description
1	VDD	Power Supply, 3.3V (typical)
2	VDD	Power Supply, 3.3V (typical)
3	VSS	Ground
4	REV	Reverse Scan selection {High:2.5(min), 3.3(typ),3.6(max); Low: 0.5(max)}
5	Rin1-	-LVDS differential data input (R0-R5,G0)
6	Rin1+	+LVDS differential data input (R0-R5,G0)
7	VSS	Ground
8	Rin2-	-LVDS differential data input (G1-G5,B0-B1)
9	Rin2+	+LVDS differential data input (G1-G5,B0-B1)
10	VSS	Ground
11	Rin3-	-LVDS differential data input (B2-B5,HS,VS,DE)
12	Rin3+	+LVDS differential data input (B2-B5,HS,VS,DE)
13	VSS	Ground
14	ClkIN-	-LVDS differential clock input
15	ClkIN+	+LVDS differential clock input
16	GND	Ground
17	Rin4-	-LVDS differential data input (R6-R7,G6-G7,B6-B7)
18	Rin4+	+LVDS differential data input (R6-R7,G6-G7,B6-B7)
19	SEL68	6/8 bits LVDS data input selection(H:8bit L/NC:6bit)
20	Bist	Internal use

Note(1) : All input signals shall be low or Hi-resistance state when VDD is off.

### BL

Pin No.	Function
1	VCC(12V input)
2	GND
3	On/Off(5V-ON,0V-OFF)
4	Dimming(PWM)
5	NC

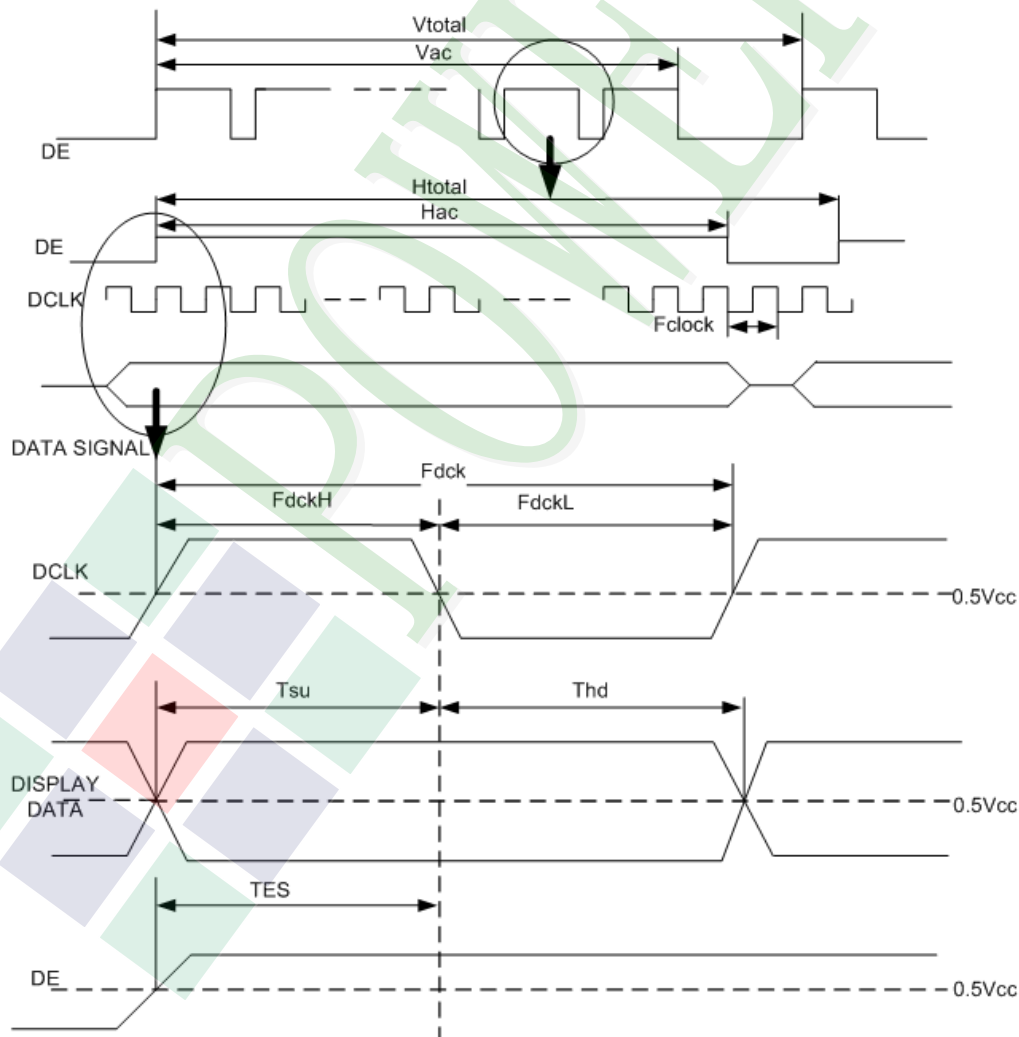
## 2.3 Timing Characteristics

### Interface Timings

Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency	Fclk	MHz	50	65	80
H Total Time	HT	Clocks	1100	1344	2047
H Active Time	HA	Clocks	1024	1024	1024
H Blanking Time	HBL	Clocks	76	320	1023
V Total Time	VT	Lines	776	806	1023
V Active Time	VA	Lines	768	768	768
V Blanking Time	VBL	Lines	8	38	255
Frame Rate	Vsync	Hz	-	60	-

Note: H Blanking Time and V Blanking Time can not be changed at every frame.

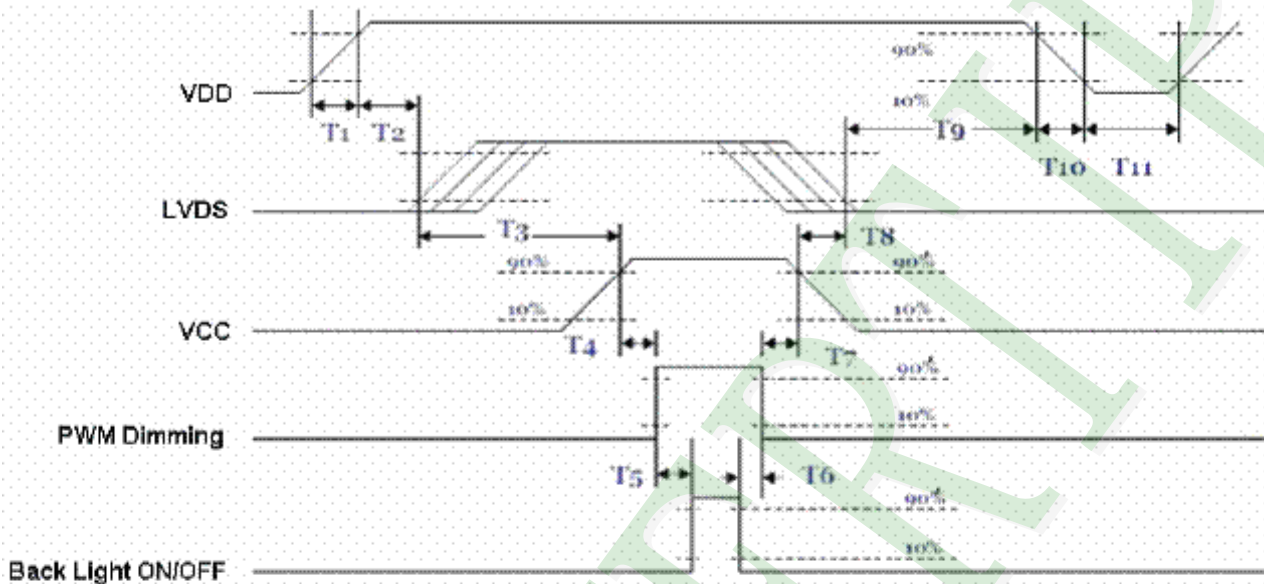
Timing Characteristics



## Power ON/OFF Sequence

Power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VDD is off.

### Power Sequence



### Power ON/OFF sequence timing

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.5	-	10	[ms]
T2	30	40	50	[ms]
T3	200	-	-	[ms]
T4	10	-	-	[ms]
T5	10	-	-	[ms]
T6	0	-	-	[ms]
T7	10	-	-	[ms]
T8	100	-	-	[ms]
T9	0	16	50	[ms]
T10	-	-	10	[ms]
T11	1000	-	-	[ms]

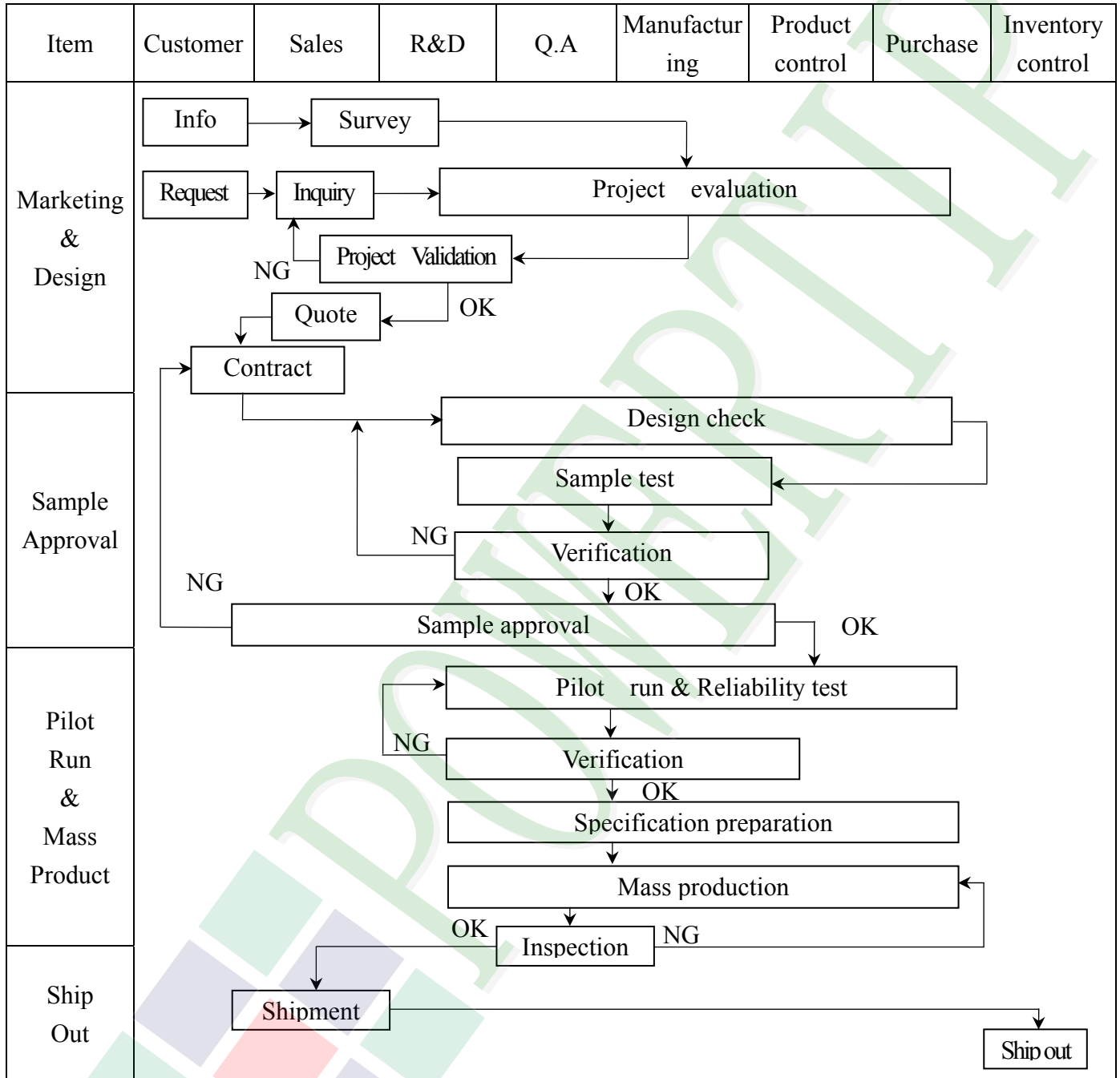
Note

(1) Power On Sequence: VCC-> AVDD -> VGL -> VGH -> Data -> B/L

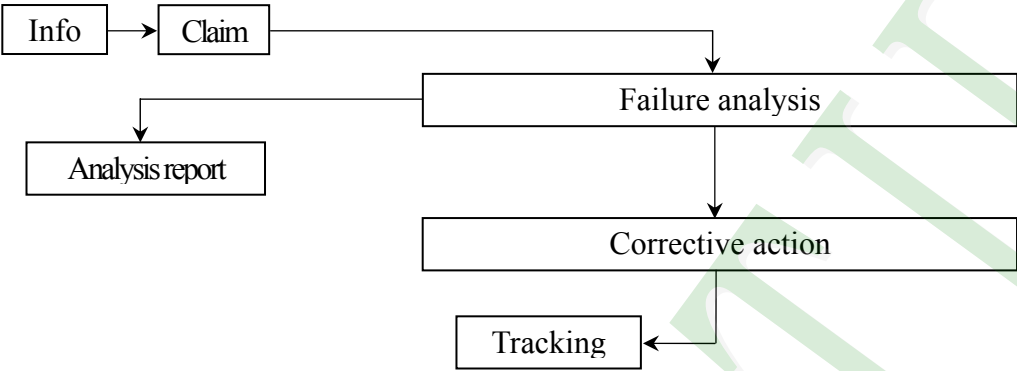
(2) Power Off Sequence: B/L-> Data -> VGH -> VGL -> AVDD -> VCC

### 3. QUALITY ASSURANCE SYSTEM

#### 3.1 Quality Assurance Flow Chart





Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD     Info[Info] --&gt; Claim[Claim]     Claim --&gt; Failure[Failure analysis]     Failure --&gt; Report[Analysis report]     Failure --&gt; Action[Corrective action]     Action --&gt; Tracking[Tracking]           </pre>							
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education And Training Activities			

### 3.2. Inspection Specification

◆Scope : The document shall be applied to TFT-LCD Module for 3.5" ~12.1" (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

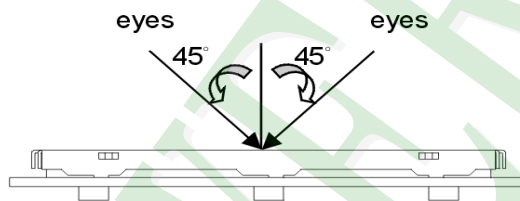
◆OUT Going Defect Level : Sampling.

◆Standard of the product appearance test :

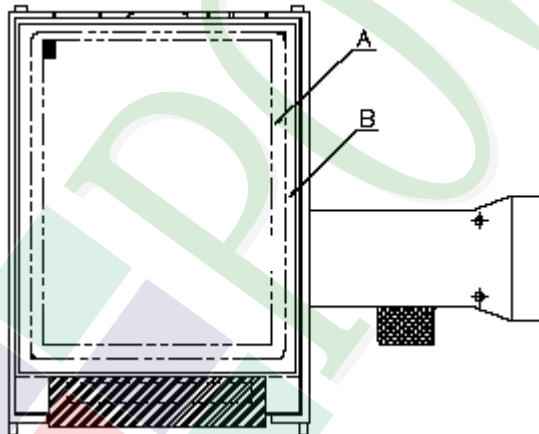
a. Manner of appearance test :

(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

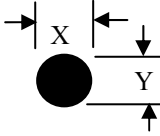
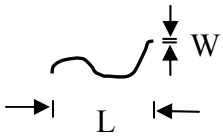
*B* area : Outside of viewing area

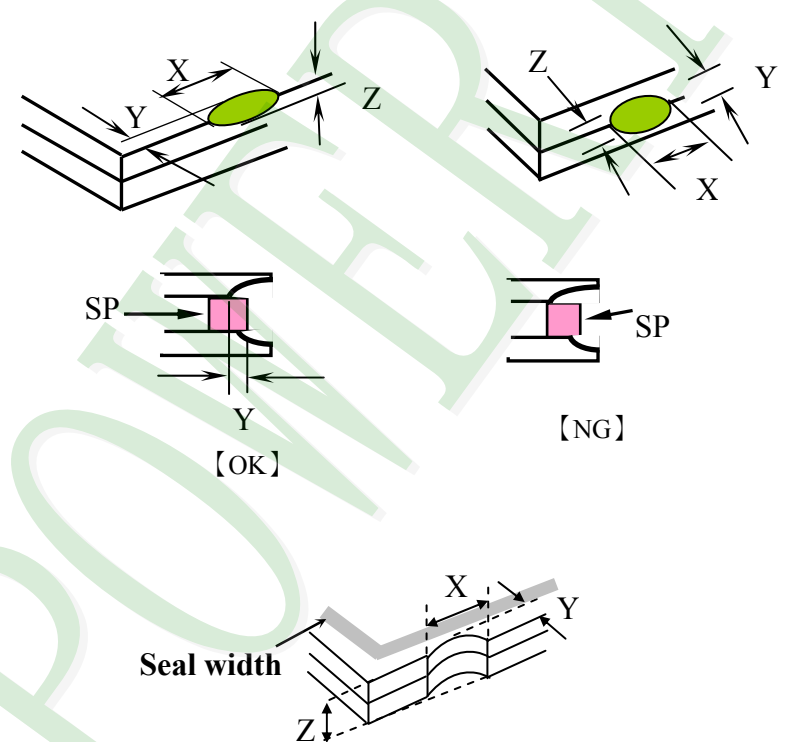
(4) . Standard of inspection : (Unit : mm)

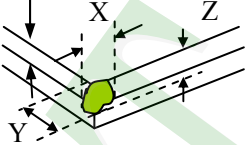
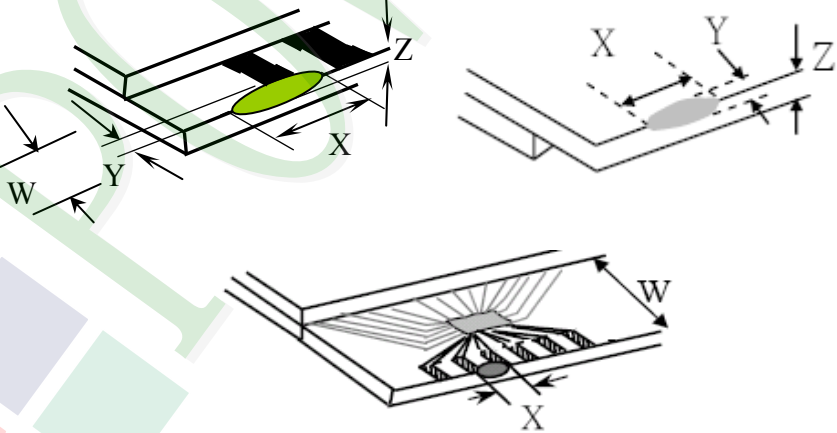
◆Specification For TFT-LCD Module 3. 5" ~12. 1" :

(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	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Item</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;"><b>Dot Defect</b></td> <td style="text-align: center;">Bright Dot</td> <td style="text-align: center;"><math>\leq 4</math></td> </tr> <tr> <td style="text-align: center;">Dark Dot</td> <td style="text-align: center;"><math>\leq 5</math></td> </tr> <tr> <td style="text-align: center;">Joint Dot</td> <td style="text-align: center;"><math>\leq 3</math></td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;"><math>\leq 7</math></td> </tr> </tbody> </table> <p>5. 1 Inspection pattern : full white , full black , Red , Green and blue screens. 5. 2 It is defined as dot defect if defect area <math>&gt;1/2</math> dot. 5. 3 The distance between two dot defect <math>\geq 5</math> mm. 5. 4 Bright dot that can be seen through 8%ND filter.</p>		Item	Acceptance (Q'ty)	<b>Dot Defect</b>	Bright Dot	$\leq 4$	Dark Dot	$\leq 5$	Joint Dot	$\leq 3$	Total	$\leq 7$	Minor
	Item	Acceptance (Q'ty)													
<b>Dot Defect</b>	Bright Dot	$\leq 4$													
	Dark Dot	$\leq 5$													
	Joint Dot	$\leq 3$													
	Total	$\leq 7$													

NO	Item	Criterion	Level																																									
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p><math>\Phi = (x + y) / 2</math></p> <p>Line type</p> 	<p>6. 1 Round type ( Non-display or display ) :</p> <table border="1" data-bbox="529 439 1307 855"> <thead> <tr> <th rowspan="2">Dimension (diameter : <math>\Phi</math>)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.25</math></td> <td colspan="2">Ignore</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.50</math></td> <td>5</td> <td rowspan="2">Ignore</td> </tr> <tr> <td><math>\Phi &gt; 0.50</math></td> <td>0</td> </tr> <tr> <td><b>Total</b></td> <td colspan="2"><b>5</b></td> </tr> </tbody> </table> <p>6. 2 Line type( Non-display or display) :</p> <table border="1" data-bbox="502 974 1335 1442"> <thead> <tr> <th rowspan="2">Length (L)</th> <th rowspan="2">Width (W)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>---</td> <td><math>W \leq 0.03</math></td> <td colspan="2">Ignore</td> </tr> <tr> <td><math>L \leq 10.0</math></td> <td><math>0.03 &lt; W \leq 0.05</math></td> <td>4</td> <td rowspan="3">Ignore</td> </tr> <tr> <td><math>L \leq 5.0</math></td> <td><math>0.05 &lt; W \leq 0.10</math></td> <td>2</td> </tr> <tr> <td>---</td> <td><math>W &gt; 0.10</math></td> <td colspan="2">As round type</td> </tr> <tr> <td colspan="2"><b>Total</b></td> <td colspan="2"><b>5</b></td> </tr> </tbody> </table>	Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore		$0.25 < \Phi \leq 0.50$	5	Ignore	$\Phi > 0.50$	0	<b>Total</b>	<b>5</b>		Length (L)	Width (W)	Acceptance (Q'ty)		A area	B area	---	$W \leq 0.03$	Ignore		$L \leq 10.0$	$0.03 < W \leq 0.05$	4	Ignore	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type		<b>Total</b>		<b>5</b>		Minor
Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)																																											
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---	$W \leq 0.03$	Ignore																																										
$L \leq 10.0$	$0.03 < W \leq 0.05$	4	Ignore																																									
$L \leq 5.0$	$0.05 < W \leq 0.10$	2																																										
---	$W > 0.10$	As round type																																										
<b>Total</b>		<b>5</b>																																										
07	<p>Polarizer Bubble</p>	<table border="1" data-bbox="494 1512 1342 1933"> <thead> <tr> <th rowspan="2">Dimension (diameter : <math>\Phi</math>)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.25</math></td> <td colspan="2">Ignore</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.50</math></td> <td>4</td> <td rowspan="3">Ignore</td> </tr> <tr> <td><math>0.50 &lt; \Phi \leq 0.80</math></td> <td>1</td> </tr> <tr> <td><math>\Phi &gt; 0.80</math></td> <td>0</td> </tr> <tr> <td><b>Total</b></td> <td colspan="2"><b>5</b></td> </tr> </tbody> </table>	Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore		$0.25 < \Phi \leq 0.50$	4	Ignore	$0.50 < \Phi \leq 0.80$	1	$\Phi > 0.80$	0	<b>Total</b>	<b>5</b>		Minor																							
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NO	Item	Criterion	Level						
08	The crack of glass	<p><b>Symbols :</b></p> <p><b>X :</b> The length of crack  <b>Z :</b> The thickness of crack  <b>t :</b> The thickness of glass</p> <p><b>Y :</b> The width of crack.  <b>W :</b> terminal length  <b>a :</b> LCD side length</p>	Minor						
		<p>8. 1 General glass chip :</p> <p>8. 1. 1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="539 1585 1353 1883"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td><math>\leq a</math></td> <td>Crack can't enter viewing area</td> <td><math>\leq 1/2 t</math></td> </tr> <tr> <td><math>\leq a</math></td> <td>Crack can't exceed the half of SP width.</td> <td><math>1/2 t &lt; Z \leq 2 t</math></td> </tr> </tbody> </table>		X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$
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<p>8.2 Protrusion over terminal :</p> <p>8.2.1 Chip on electrode pad :</p>  <table border="1" data-bbox="560 1711 1347 1883"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>Front</td> <td><math>\leq a</math></td> <td><math>\leq 1/2 W</math></td> <td><math>\leq t</math></td> </tr> <tr> <td>Back</td> <td><math>\leq a</math></td> <td><math>\leq W</math></td> <td><math>\leq 1/2 t</math></td> </tr> </tbody> </table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$	Minor
	X	Y	Z										
Front	$\leq a$	$\leq 1/2 W$	$\leq t$										
Back	$\leq a$	$\leq W$	$\leq 1/2 t$										



◆Specification For TFT-LCD Module 3. 5" ~12. 1" :

(Ver.B01)

NO	Item	Criterion	Level
09	Backlight elements	9. 1 Backlight can't work normally.	Major
		9. 2 Backlight doesn't light or color is wrong.	Major
		9. 3 Illumination source flickers when lit.	Major
10	General appearance	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. 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. 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 $\leq 1.5$ mm.	Minor



## 4. RELIABILITY TEST

### 4.1 Reliability Test Condition

(Ver.B01)

NO.	TEST ITEM	TEST CONDITION										
1	High Temperature Storage Test	Keep in +80 $\pm$ 2 $^{\circ}$ C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
2	Low Temperature Storage Test	Keep in -30 $\pm$ 2 $^{\circ}$ C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
3	High Temperature / High Humidity Storage Test	Keep in +60 $^{\circ}$ C / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer )										
4	Temperature Cycling Storage Test	<p style="text-align: center;"> <math>-30^{\circ}\text{C} \rightarrow +25^{\circ}\text{C} \rightarrow +80^{\circ}\text{C} \rightarrow +25^{\circ}\text{C}</math>            (30mins) (5mins) (30mins) (5mins)  <math>\leftarrow \hspace{10em} \rightarrow</math>            10 Cycle         </p> <p>Surrounding temperature, then storage at normal condition 4hrs.</p>										
5	ESD Test	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Air Discharge:</b>            Apply 2 KV with 5 times            Discharge for each polarity +/-         </td> <td style="width: 50%;"> <b>Contact Discharge:</b>            Apply 250 V with 5 times            discharge for each polarity +/-         </td> </tr> </table>	<b>Air Discharge:</b> Apply 2 KV with 5 times Discharge for each polarity +/-	<b>Contact Discharge:</b> Apply 250 V with 5 times discharge for each polarity +/-								
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<ol style="list-style-type: none"> <li>1. Temperature ambience : 15<math>^{\circ}</math>C~35<math>^{\circ}</math>C</li> <li>2. Humidity relative : 30%~60%</li> <li>3. Energy Storage Capacitance(Cs+Cd) : 150pF <math>\pm</math>10%</li> <li>4. Discharge Resistance(Rd) : 330<math>\Omega</math> <math>\pm</math>10%</li> <li>5. Discharge, mode of operation :            Single Discharge (time between successive discharges at least 1 sec)            (Tolerance if the output voltage indication : <math>\pm</math>5%)</li> </ol>												
6	Vibration Test (Packaged)	<ol style="list-style-type: none"> <li>1. Sine wave 10~55 Hz frequency (1 min/sweep)</li> <li>2. The amplitude of vibration :1.5 mm</li> <li>3. Each direction (X、Y、Z) duration for 2 Hrs</li> </ol>										
7	Drop Test (Packaged)	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Packing Weight (Kg)</th> <th>Drop Height (cm)</th> </tr> </thead> <tbody> <tr> <td>0 ~ 45.4</td> <td>122</td> </tr> <tr> <td>45.4 ~ 90.8</td> <td>76</td> </tr> <tr> <td>90.8 ~ 454</td> <td>61</td> </tr> <tr> <td>Over 454</td> <td>46</td> </tr> </tbody> </table>	Packing Weight (Kg)	Drop Height (cm)	0 ~ 45.4	122	45.4 ~ 90.8	76	90.8 ~ 454	61	Over 454	46
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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  $320 \pm 10^{\circ}\text{C}$  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  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  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.

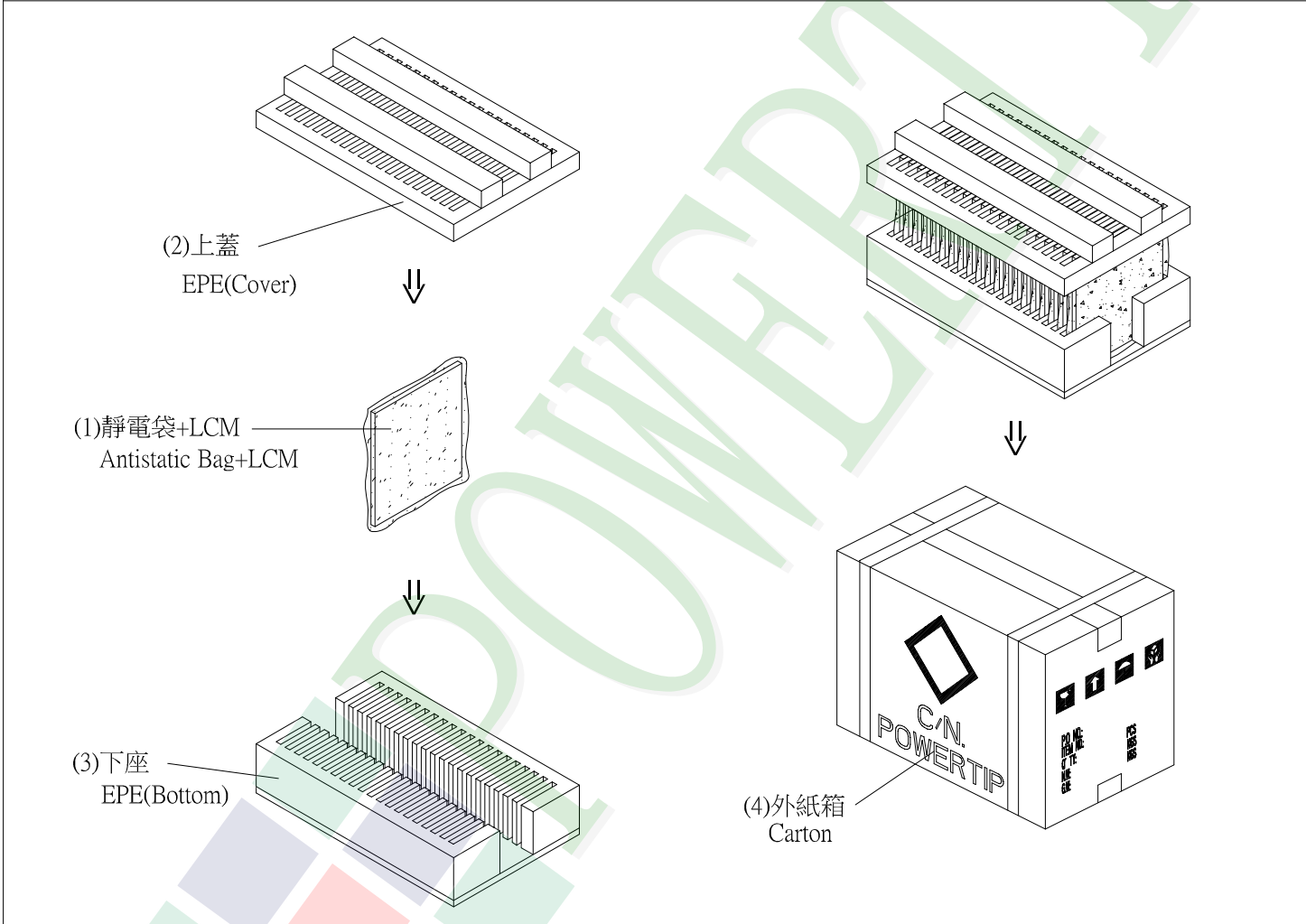


1. 包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	IPcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH102768T001-ZAA	279.0 X 209.0	0.442	20	8.84
2	靜電袋(1)Antistatic Bag	--	--	--	20	--
3	上蓋(2)EPE(Cover)	FOAM000000147	520 X 315 X 65	0.16	1	0.16
4	下座(3)EPE(Bottom)	FOAM000000148	520 X 315 X 105	0.335	1	0.335
5	外紙箱(4)Carton	BX52732536CCBA	527 X 325 X 360	1.092	1	1.092
6						

2. 一整箱總重量 (Total LCD Weight in carton) : 10.43 Kg±10%

3. 單箱數量規格表 (Packaging Specifications and Quantity) :  
 Total LCM quantity in carton : quantity per EPE      20      x no of EPE      1      =      20



特 記 事 項 (REMARK)

4. 使用供應商原包裝靜電袋。