



SPECIFICATIONS

CUSTOMER	:	PTC
SAMPLE CODE	:	SH102600T003-IBA
MASS PRODUCTION CODE	:	PH102600T003-IBA
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	LMD-PH102600T003-IBA (Ver.002)
PACKAGING NO. (Ver.)	:	PKG-PH102600T003-IBA (Ver.002)

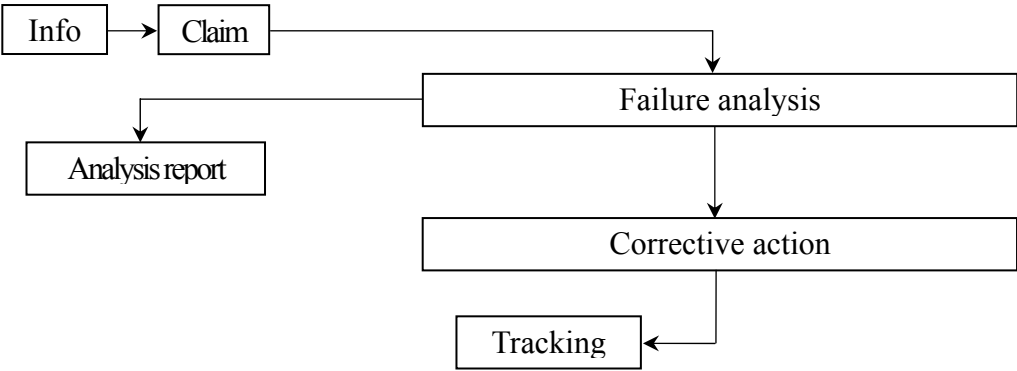
Customer Approved
<div style="text-align: right; margin-top: 20px;">Date:</div>

Approved	Checked	Designer
黃秋源 Oliver Huang	李健弘 Lambert Lee	黃俊清 Ackey Huang

Preliminary specification for design input
 Specification for sample approval

POWERTIP TECH. CORP.

Headquarters: No.8, 6 th Road, Taichung Industrial Park, Taichung, Taiwan 台中市 407 工業區六路 8 號	TEL: 886-4-2355-8168 FAX: 886-4-2355-8166	E-mail: sales@powertip.com.tw Http://www.powertip.com.tw
---	--	--

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD Info[Info] --> Claim[Claim] Claim --> Failure[Failure analysis] Failure --> Report[Analysis report] Failure --> Action[Corrective action] Action --> 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" ~10.1" (Ver.B01).

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

Equipment : Gauge, MIL-STD, Powertip Tester, Sample

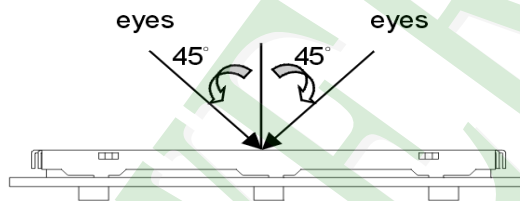
Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL : 1.5

OUT Going Defect Level : Sampling.

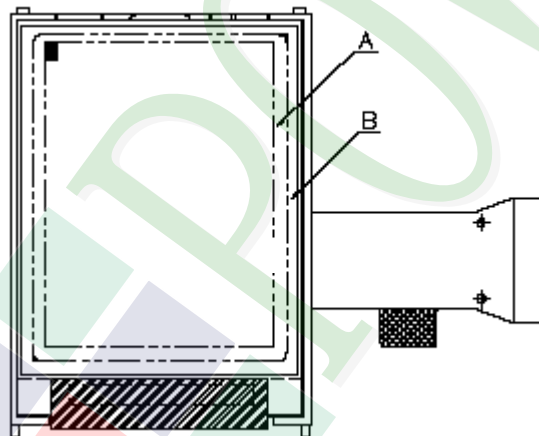
Standard of the product appearance test :

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

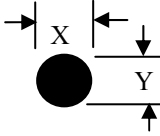
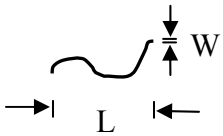
B area : Outside of viewing area

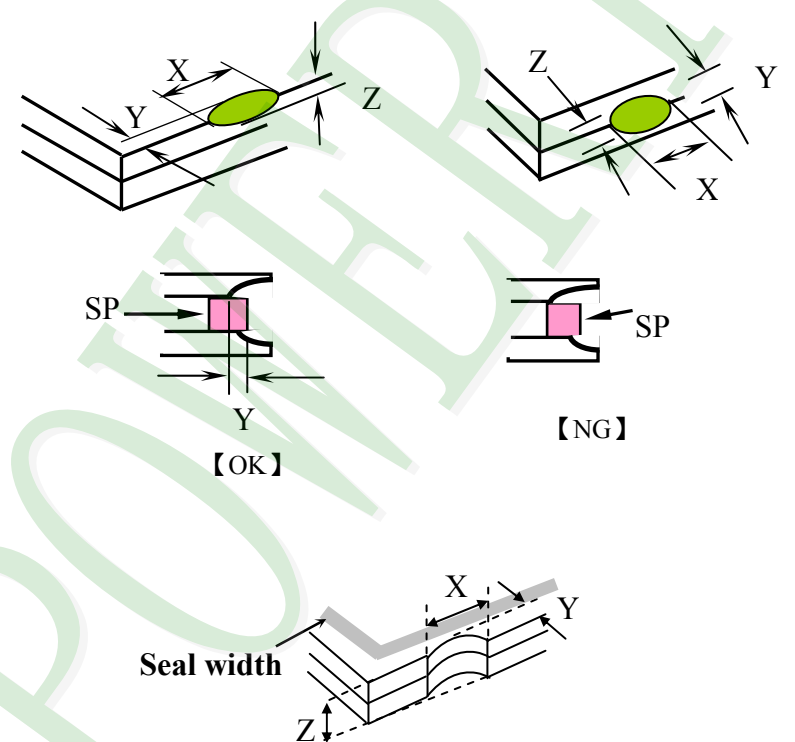
(4). Standard of inspection : (Unit : mm)

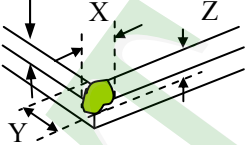
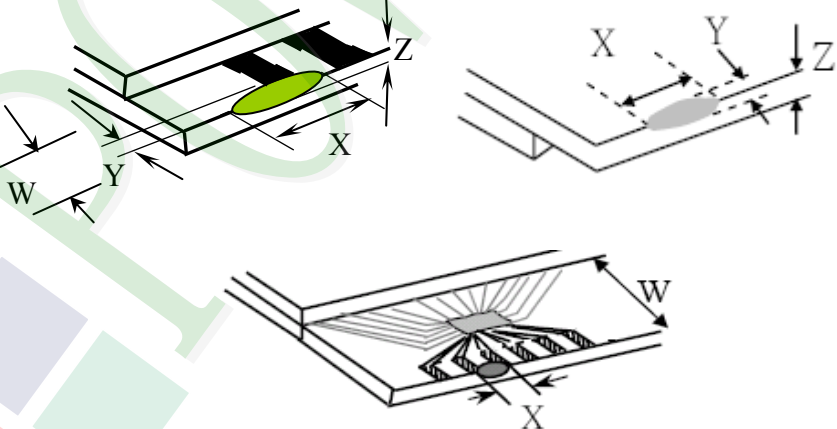
Specification For TFT-LCD Module 3.5" ~10.1" :

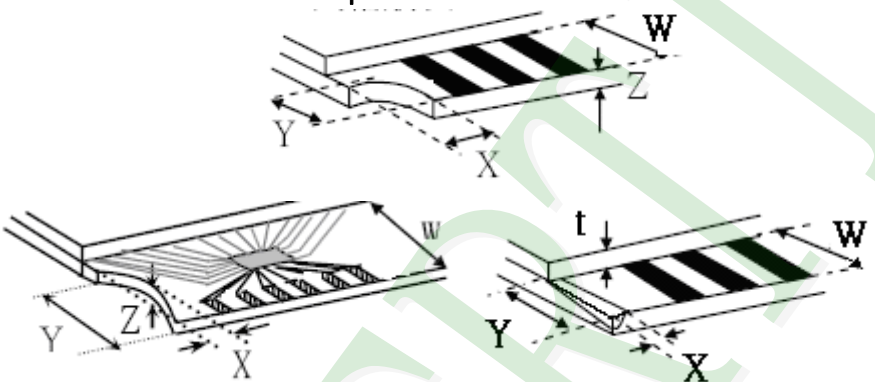
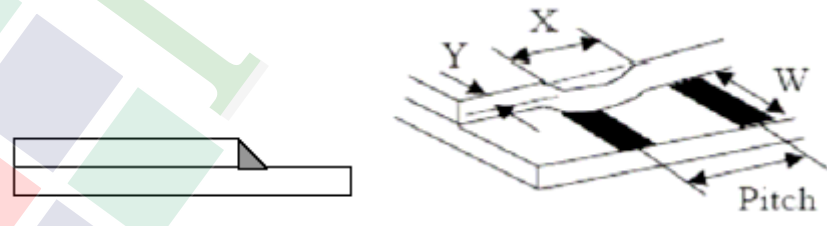
(Ver.B01)

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" data-bbox="561 1323 1273 1630"> <thead> <tr> <th data-bbox="561 1323 676 1384">Item</th> <th data-bbox="676 1323 1273 1384">Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td data-bbox="561 1384 676 1444">Bright Dot</td> <td data-bbox="676 1384 1273 1444">4</td> </tr> <tr> <td data-bbox="561 1444 676 1505">Dark Dot</td> <td data-bbox="676 1444 1273 1505">5</td> </tr> <tr> <td data-bbox="561 1505 676 1565">Joint Dot</td> <td data-bbox="676 1505 1273 1565">3</td> </tr> <tr> <td data-bbox="561 1565 676 1630">Total</td> <td data-bbox="676 1565 1273 1630">7</td> </tr> </tbody> </table> <p data-bbox="459 1675 1377 1928"> 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. 5.4 Bright dot that can be seen through 5% ND filter. </p>	Item	Acceptance (Q'ty)	Bright Dot	4	Dark Dot	5	Joint Dot	3	Total	7	Minor
Item	Acceptance (Q'ty)												
Bright Dot	4												
Dark Dot	5												
Joint Dot	3												
Total	7												

NO	Item	Criterion	Level																																					
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p>$\Phi = (x + y) / 2$</p> <p>Line type</p> 	<p>6.1 Round type (Non-display or display) :</p> <table border="1" data-bbox="526 436 1308 862"> <thead> <tr> <th rowspan="2">Dimension (diameter : Φ)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.25$</td> <td>Ignore</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.50$</td> <td>5</td> </tr> <tr> <td>$\Phi > 0.50$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> <td></td> </tr> </tbody> </table> <p>6.2 Line type(Non-display or display) :</p> <table border="1" data-bbox="502 974 1332 1444"> <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>$W \leq 0.03$</td> <td>Ignore</td> <td rowspan="5">Ignore</td> </tr> <tr> <td>$L \leq 10.0$</td> <td>$0.03 < W \leq 0.05$</td> <td>4</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.05 < W \leq 0.10$</td> <td>2</td> </tr> <tr> <td>---</td> <td>$W > 0.10$</td> <td>As round type</td> </tr> <tr> <td>Total</td> <td></td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore	Ignore	$0.25 < \Phi \leq 0.50$	5	$\Phi > 0.50$	0	Total	5		Length (L)	Width (W)	Acceptance (Q'ty)		A area	B area	---	$W \leq 0.03$	Ignore	Ignore	$L \leq 10.0$	$0.03 < W \leq 0.05$	4	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type	Total		5	Minor
Dimension (diameter : Φ)	Acceptance (Q'ty)																																							
	A area	B area																																						
$\Phi \leq 0.25$	Ignore	Ignore																																						
$0.25 < \Phi \leq 0.50$	5																																							
$\Phi > 0.50$	0																																							
Total	5																																							
Length (L)	Width (W)	Acceptance (Q'ty)																																						
		A area	B area																																					
---	$W \leq 0.03$	Ignore	Ignore																																					
$L \leq 10.0$	$0.03 < W \leq 0.05$	4																																						
$L \leq 5.0$	$0.05 < W \leq 0.10$	2																																						
---	$W > 0.10$	As round type																																						
Total		5																																						
07	<p>Polarizer Bubble</p>	<table border="1" data-bbox="494 1512 1340 1937"> <thead> <tr> <th rowspan="2">Dimension (diameter : Φ)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.25$</td> <td>Ignore</td> <td rowspan="5">Ignore</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.50$</td> <td>4</td> </tr> <tr> <td>$0.50 < \Phi \leq 0.80$</td> <td>1</td> </tr> <tr> <td>$\Phi > 0.80$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore	Ignore	$0.25 < \Phi \leq 0.50$	4	$0.50 < \Phi \leq 0.80$	1	$\Phi > 0.80$	0	Total	5	Minor																					
Dimension (diameter : Φ)	Acceptance (Q'ty)																																							
	A area	B area																																						
$\Phi \leq 0.25$	Ignore	Ignore																																						
$0.25 < \Phi \leq 0.50$	4																																							
$0.50 < \Phi \leq 0.80$	1																																							
$\Phi > 0.80$	0																																							
Total	5																																							

NO	Item	Criterion	Level						
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : 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 1590 1353 1881"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>Crack can't enter viewing area</td> <td>1/2 t</td> </tr> <tr> <td>a</td> <td>Crack can't exceed the half of SP width.</td> <td>1/2 t < Z 2 t</td> </tr> </tbody> </table>		X	Y	Z	a	Crack can't enter viewing area	1/2 t
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 2 t							

NO	Item	Criterion	Level										
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p> <hr/> <p>8.1.2 Corner crack :</p>  <table border="1" data-bbox="520 779 1337 1070"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <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> </tbody> </table>	X	Y	Z	1/5 a	Crack can't enter viewing area	Z 1/2 t	1/5 a	Crack can't exceed the half of SP width.	1/2 t < Z 2 t		
		X	Y	Z									
1/5 a	Crack can't enter viewing area	Z 1/2 t											
1/5 a	Crack can't exceed the half of SP width.	1/2 t < Z 2 t											
<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>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> </tbody> </table>		X	Y	Z	Front	a	1/2 W	t	Back	a	W	1/2 t	Minor
	X	Y	Z										
Front	a	1/2 W	t										
Back	a	W	1/2 t										

NO	Item	Criterion	Level												
08	The crack of glass	<p>Symbols :</p> <p>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</p> <hr/> <p>8.2.2 Non-conductive portion :</p>  <table border="1" data-bbox="625 981 1257 1133"> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">Y</td> <td style="text-align: center;">Z</td> </tr> <tr> <td style="text-align: center;">$1/3 a$</td> <td style="text-align: center;">W</td> <td style="text-align: center;">t</td> </tr> </table> <p>If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>8.2.3 Glass remain :</p>  <table border="1" data-bbox="545 1760 1238 1899"> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">Y</td> <td style="text-align: center;">Z</td> </tr> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">$1/3 W$</td> <td style="text-align: center;">t</td> </tr> </table>	X	Y	Z	$1/3 a$	W	t	X	Y	Z	a	$1/3 W$	t	Minor
X	Y	Z													
$1/3 a$	W	t													
X	Y	Z													
a	$1/3 W$	t													

Specification For TFT-LCD Module 3.5" ~10" :

(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 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 ±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	<div style="text-align: center;">  </div> <p>Surrounding temperature, then storage at normal condition 4hrs.</p>										
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 +/-										
		<ol style="list-style-type: none"> 1. Temperature ambience : 15 35 2. Humidity relative : 30% 60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330 ±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)	<ol style="list-style-type: none"> 1. Sine wave 10 55 Hz frequency (1 min) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、 Y、 Z) duration for 2 Hrs 										
7	Drop Test (Packaged)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Packing Weight (Kg)</th> <th>Drop Height (cm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0 ~ 45.4</td> <td style="text-align: center;">122</td> </tr> <tr> <td style="text-align: center;">45.4 ~ 90.8</td> <td style="text-align: center;">76</td> </tr> <tr> <td style="text-align: center;">90.8 ~ 454</td> <td style="text-align: center;">61</td> </tr> <tr> <td style="text-align: center;">Over 454</td> <td style="text-align: center;">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
		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 1times												

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.