



SPECIFICATIONS

| | |
|------------------------|------------------------------------|
| CUSTOMER | : CDE012 |
| SAMPLE CODE | : SH102600T003-IBC01 |
| MASS PRODUCTION CODE | : PH102600T003-IBC01 |
| SAMPLE VERSION | : 01 |
| SPECIFICATIONS EDITION | : 003 |
| DRAWING NO. (Ver.) | : LMD-PH102600T003-IBC01 (Ver.003) |
| PACKAGING NO. (Ver.) | : |

| |
|--------------------------|
| Customer Approved |
| |
| Date: |

| Approved | Checked | Designer |
|---------------------|--------------------|--------------------|
| 黃秋源 Oliver Huang | 黃俊清 Ackey Huang | 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 |
|---|--|---|

1.6 Backlight Characteristics

| Item | UNIT | MIN | TYP | MAX | CONDITION | |
|----------------------|-------|--------|------|-----|---------------|---|
| VIN_LED | V | 8 | 12 | 16 | DUTY=100% | |
| V _{VIN_LED} | mA | - | - | 543 | - | |
| F _{DIM} | HZ | 100 | - | 1K | - | |
| DUTY | % | 5 | - | 100 | - | |
| CTRL | VIH | V | 2 | 3.3 | 5 | - |
| | VIL | V | 0 | - | 0.8 | - |
| V _{OUT} | V | - | 22.4 | - | - | |
| I _{OUT} | mA | - | 160 | - | - | |
| L _T | Hours | 50,000 | - | - | LED Life Time | |

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

1.6 Touch Panel Characteristics

Features

| Item | Standard Value |
|--------------------|---|
| Touch Panel Size | 10.1" |
| Touch type | Transparent Type Projected Capacitive Multi Touch Panel |
| Input Method | 5 Point(use Finger) |
| IC | FT5826QSL |
| Response Time | 25ms |
| Light Transparency | 85% Min |
| Surface Hardness | 7H(Penci I) |

Absolute Maximum Ratings

| Item | Symbol | Condition | Min. | Max. | Unit |
|-----------------------|-----------------|-----------|------|------|------|
| Operating Temperature | T _{OP} | - | -20 | +70 | °C |
| Storage Temperature | T _{ST} | - | -30 | +80 | °C |

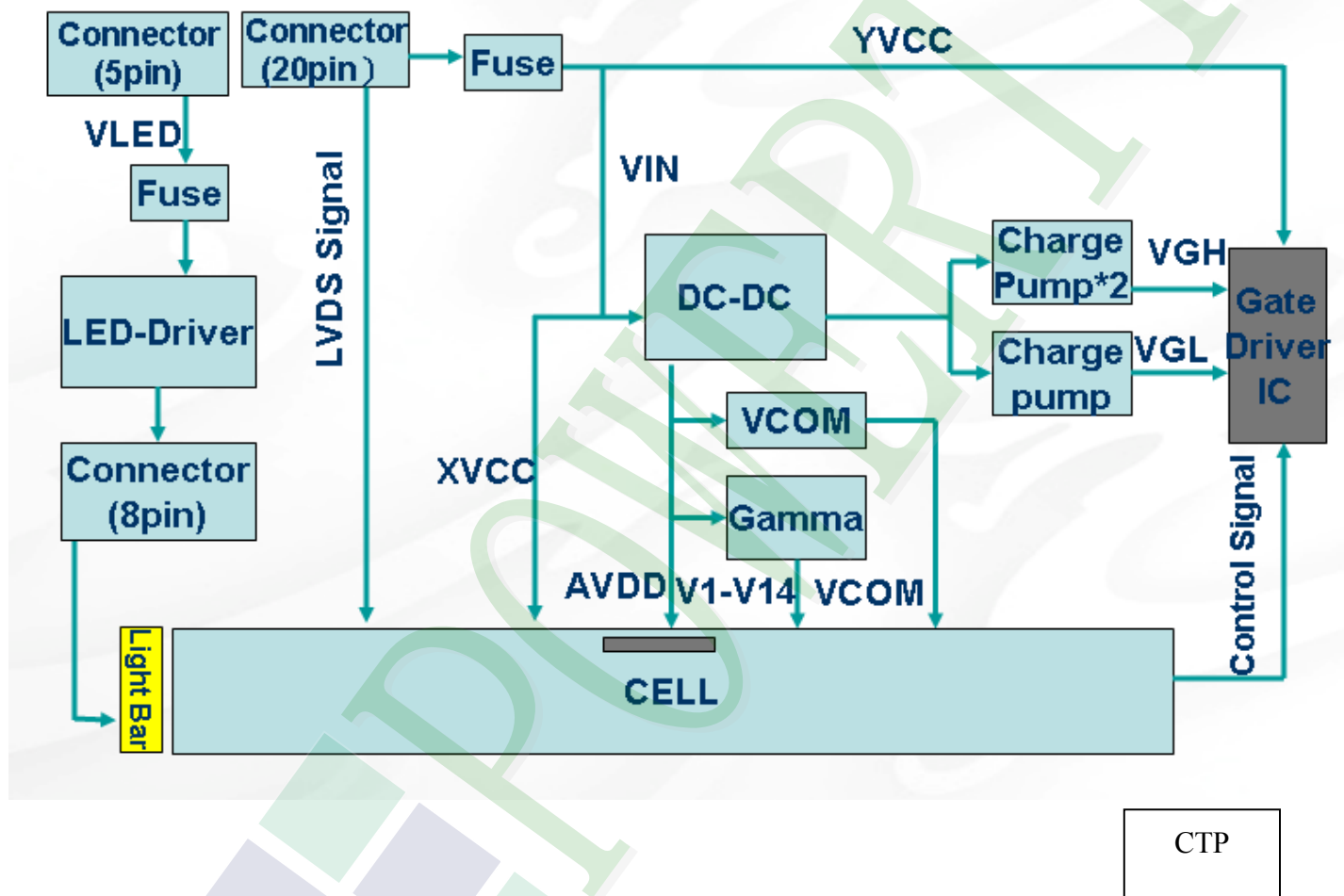
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description(CN1)

| 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. | - |
| 5 | Rin 1- | -LVDS differential data input.. | - |
| 6 | Rin 1+ | +LVDS differential data input.. | - |
| 7 | VSS | Ground. | - |
| 8 | Rin 2- | -LVDS differential data input. | - |
| 9 | Rin 2+ | +LVDS differential data input. | - |
| 10 | VSS | Ground. | - |
| 11 | Rin 3- | -LVDS differential data input. | - |
| 12 | Rin 3+ | +LVDS differential data input. | - |
| 13 | VSS | Ground. | - |
| 14 | ClkIN- | -LVDS differential data input. | - |
| 15 | ClkIN+ | +LVDS differential data input. | - |
| 16 | VSS | Ground. | - |
| 17 | NC | Not connection. | - |
| 18 | NC | Not connection. | - |
| 19 | VSS | Ground. | - |
| 20 | NC | Not connection. | High Active |

Touch Panel Interface Pin(CN3)

| Pin No. | Symbol | Description |
|---------|--------|-------------------------------|
| 1 | VDD | Supply Voltage :USB 5V. |
| 2 | D- | USB differential signal line. |
| 3 | D+ | USB differential signal line. |
| 4 | X | - |
| 5 | GND | Ground Connection. |
| 6 | X | - |

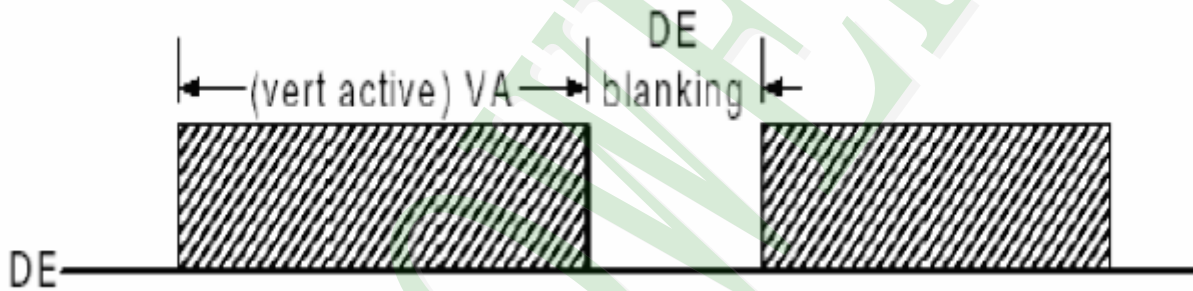
B/L Pin Assignment(CN2)

| Pin No. | Symbol | Description | Remarks |
|---------|--------|-----------------------------|---------|
| 1 | VCC | Power Supply. 12V(typical). | - |
| 2 | GND | Ground. | - |
| 3 | EN | 3.3V (typical) | - |
| 4 | PWM | 3.3V (typical) | - |
| 5 | NC | Not Connection | - |

2.3 Timing Characteristics

DE Synchronization

| Parameter | Symbol | Unit | Min. | Typ. | Max. |
|-------------------------------|--------------|--------|-------|-------|-------|
| LVDS Clock Frequency <single> | f_{dck} | MHz | 45 | 51.2 | 57 |
| H Total Time | T_{hp} | clocks | 1,324 | 1,344 | 1,364 |
| H Active Time | HA | clocks | 1,024 | 1,024 | 1,024 |
| H Blanking Time | TH_{BLANK} | clocks | 300 | 320 | 340 |
| V Total Time | T_{vp} | lines | 625 | 635 | 645 |
| V Active Time | VA | lines | 600 | 600 | 600 |
| V Blanking Time | TV_{BLANK} | lines | 25 | 35 | 45 |
| V Frequency | f_v | Hz | 55 | 60 | 65 |

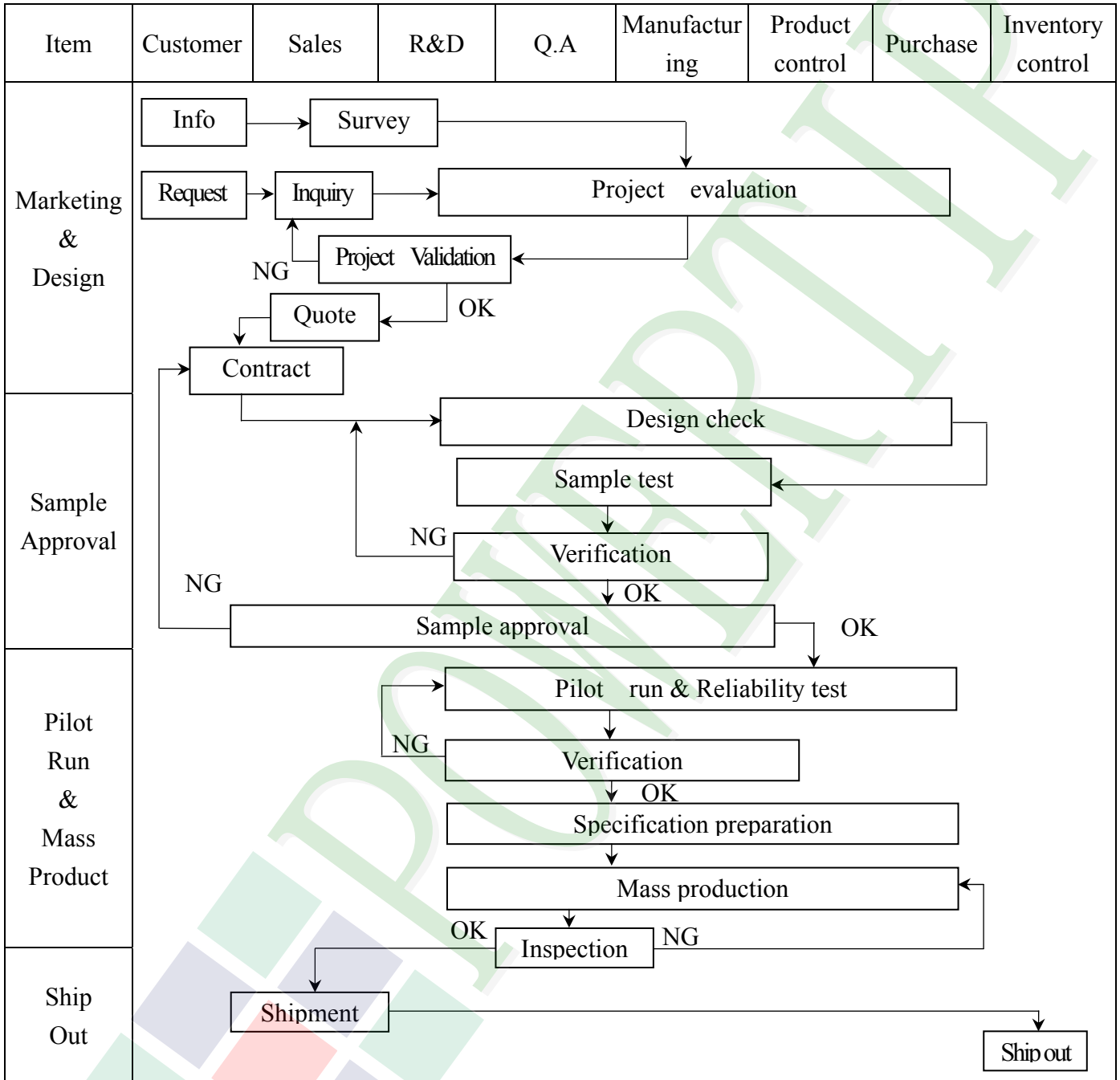


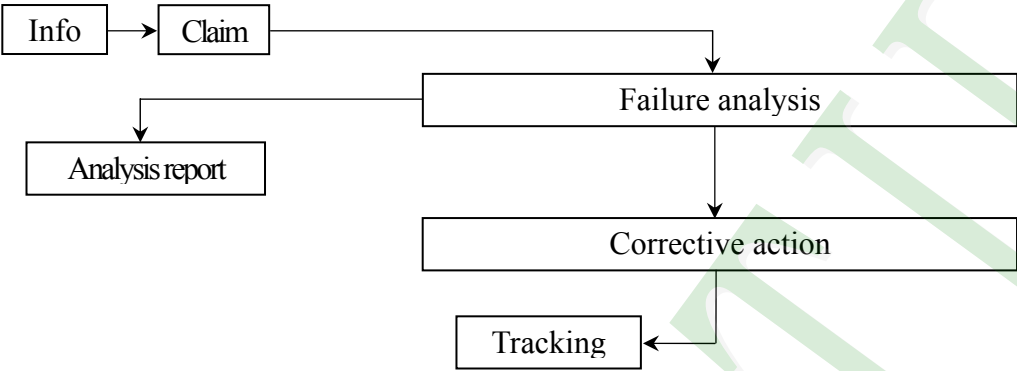
LVDS Data Mapping



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] --> Claim[Claim] Claim --> FA[Failure analysis] Claim --> AR[Analysis report] FA --> CA[Corrective action] CA --> 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

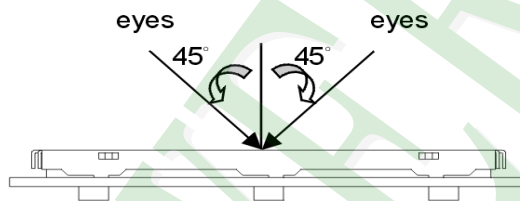
Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL : 1.5

OUT Going Defect Level : Sampling.

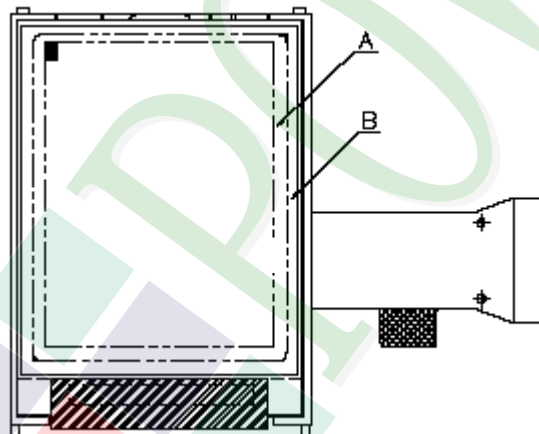
Standard of the product appearance test :

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

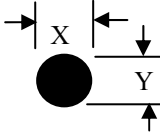
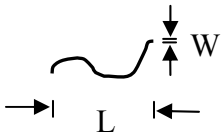
B area : Outside of viewing area

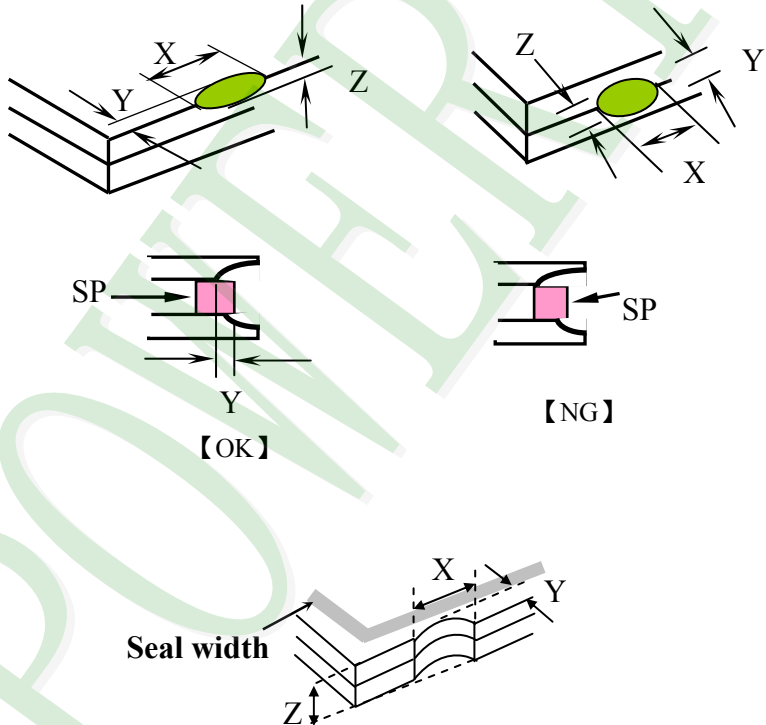
(4). Standard of inspection : (Unit : mm)

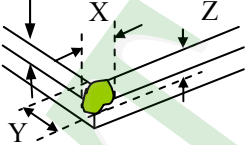
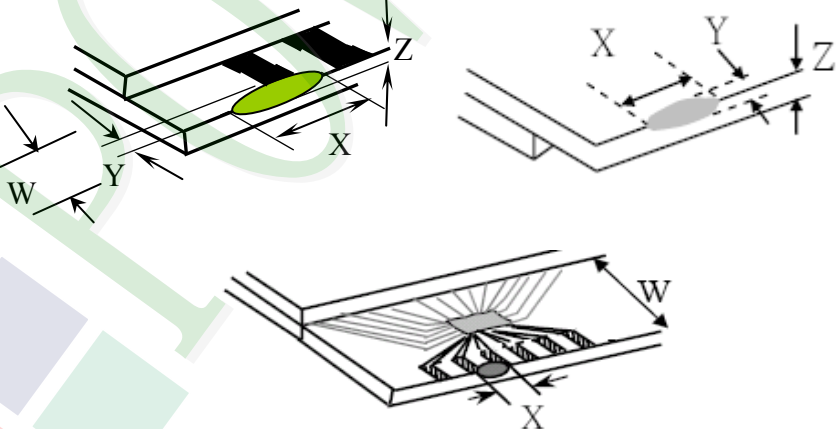
Specification For TFT-LCD Module 3.5" ~10.1" :

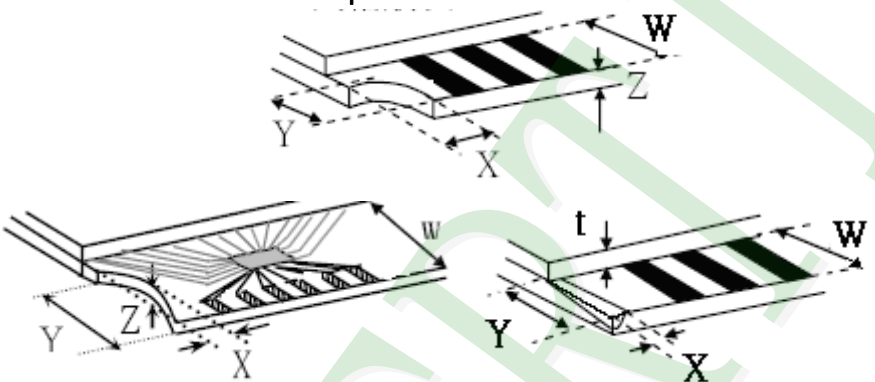
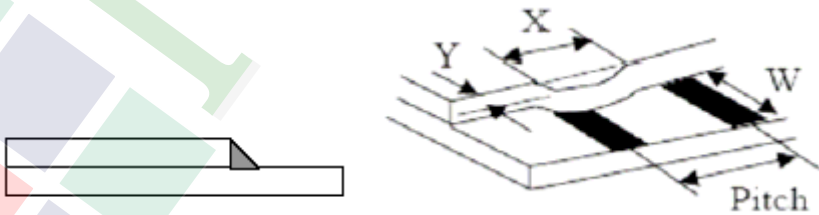
(Ver.B01)

| 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 1321 1273 1630"> <thead> <tr> <th data-bbox="561 1321 676 1384">Item</th> <th data-bbox="676 1321 1273 1384">Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td data-bbox="561 1384 676 1447">Bright Dot</td> <td data-bbox="676 1384 1273 1447">4</td> </tr> <tr> <td data-bbox="561 1447 676 1509">Dark Dot</td> <td data-bbox="676 1447 1273 1509">5</td> </tr> <tr> <td data-bbox="561 1509 676 1572">Joint Dot</td> <td data-bbox="676 1509 1273 1572">3</td> </tr> <tr> <td data-bbox="561 1572 676 1630">Total</td> <td data-bbox="676 1572 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="529 439 1307 855"> <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 1337 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>$W \leq 0.03$</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 1343 1933"> <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>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>1/3 a</td> <td>W</td> <td>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 1758 1238 1899"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>a</td> <td>1/3 W</td> <td>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 |

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.