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NR31 0DU, England

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www.midasdisplays.com

| MDT0400FIH-HDMI | 480 x 480 | HDMI Interface | TFT Module |
|---|---|---|---|

**Specification**

| Version: 1 | Date: 12/06/2020 |
|---|---|

**Revision**

| | | |
|---|---|---|
| 1 | 10/06/2020 | First issue |

| Display Features | |
|---|---|
| Display Size | 4.0” |
| Resolution | 480 x 480 |
| Orientation | Landscape |
| Appearance | RGB |
| Logic Voltage | 2.8/3.3V |
| Interface | HDMI |
| Brightness | 1000 cd/m$^2$ |
| Touchscreen | --- |
| Module Size | 77.00 x 80.00 x 15.90mm |
| Operating Temperature | -20°C ~ +70°C |
| Pinout | --- |
| Pitch | --- |

RoHS compliant

| Box Quantity | Weight / Display |
|---|---|
| --- | --- |



* - For full design functionality, please use this specification in conjunction with the ST7701S specification.(Provided Separately)

| Display Accessories | |
|---|---|
| **Part Number** | **Description** |
| | |
| | |
| | |

| Optional Variants | |
|---|---|
| **Appearances** | **Voltage** |
| | |

## Scope

This is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorpho us silicon TFT as a switching device. This module is composed of a Transmissive type TFT-LCD Pan el, driver circuit, HDMI PCBA and back-light unit. The resolution of a 4.0 " TFT-LCD contains 480x480 pixels, and can display up to 65K/262K/16.7M colors.

### 1. Basic Description

| General Information Items | Specifications | Unit | Note |
|---|---|---|---|
| | Main Panel | | |
| Display area(AA) | 71.86(H)*70.18V) (4.0 inch) | mm | |
| Driver element | TFT active matrix | - | |
| Display colors | 65K/262K/16.7M | colors | |
| Number of pixels | 480(RGB)*480 | dots | |
| Pixel arrangement | RGB vertical stripe | - | |
| Pixel pitch | 0.1497(H)*0.1462(V) | mm | |
| Viewing angle | ALL | o'clock | |
| Controller IC | ST7701S | - | |
| Operating temperature | -20～+70 | ℃ | |
| Storage temperature | -30～+80 | ℃ | |
| LCM Luminance | 1000 nits (Typ.) | | |
| Video Input | HDMI | | |
| HDMI it Firmware Version | MDT0400FIH-HDMI | | |

## 2. Mechanical Information

| Item | | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|
| Module size | Horizontal(H) | - | 77 | - | mm | |
| | Vertical(V) | - | 80 | - | mm | |
| | Depth(D) | - | 15.9 | - | mm | |
| Weight | | - | 30 | - | g | |

## 3 Recommended Resolution

| | |
|---|---|
| Recommended Resolution | 480(RGB)*480 @55~60 Hz |

## 4 Plug & Play

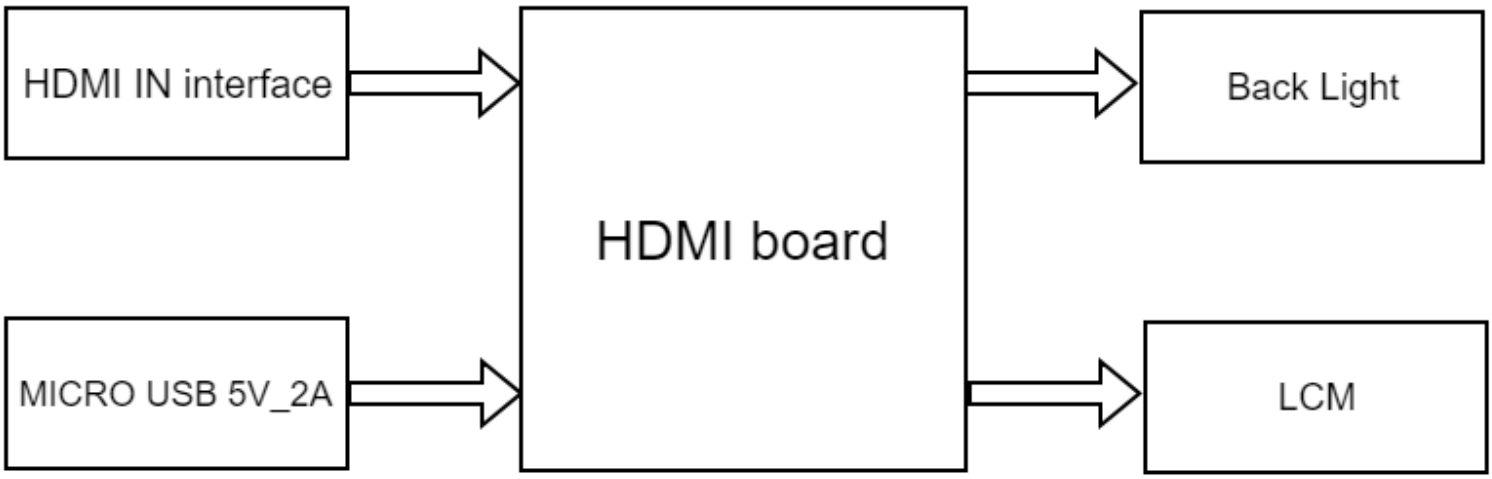
| |
|---|
| DDC2B /VESA Standard |

## 5 Power Supply Rating

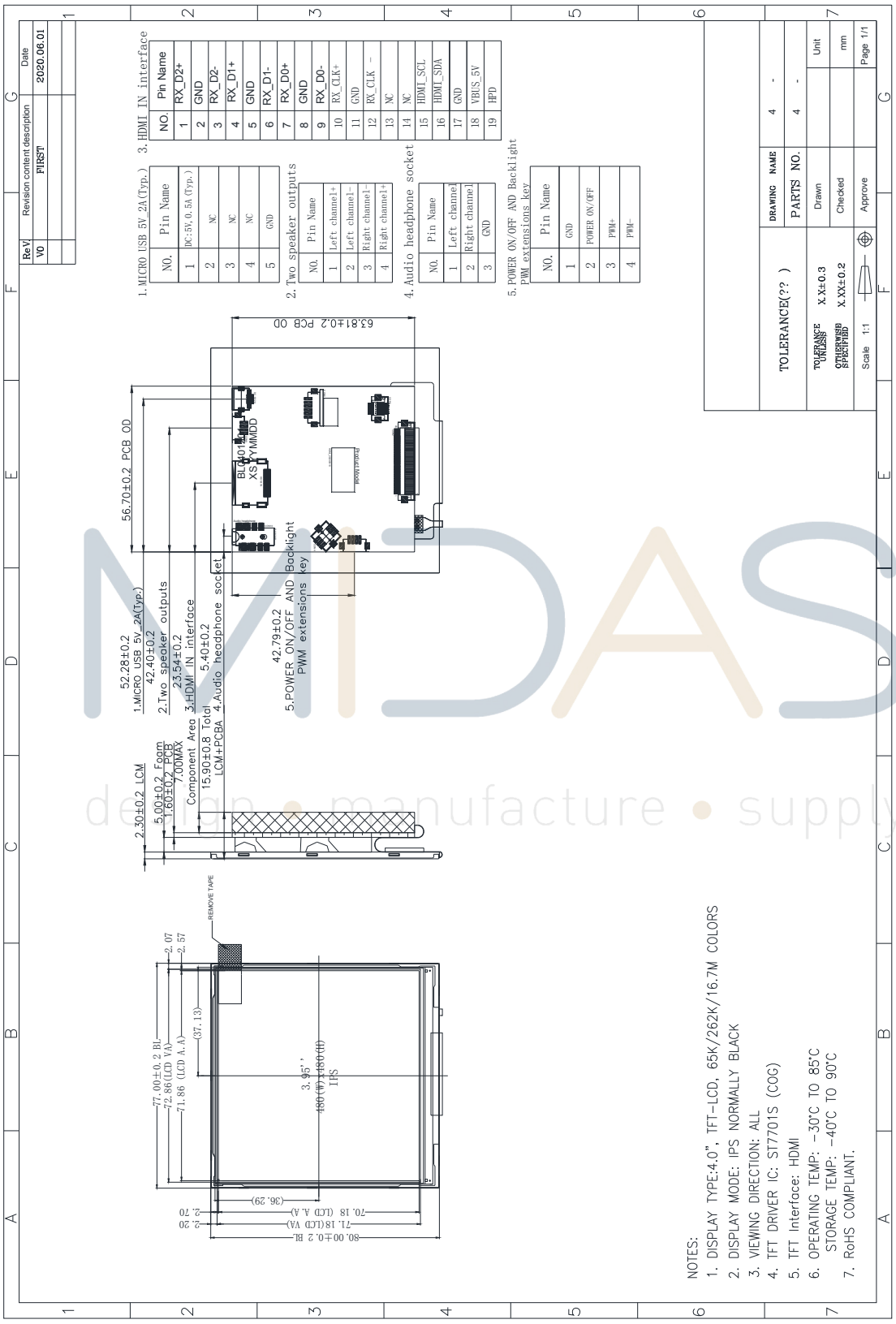
| | |
|---|---|
| Power Consumption | 2.5W Watt (Typ.) |
| MICRO USB DC POWER | 5V 2A(Typ.) |



## Block Diagram



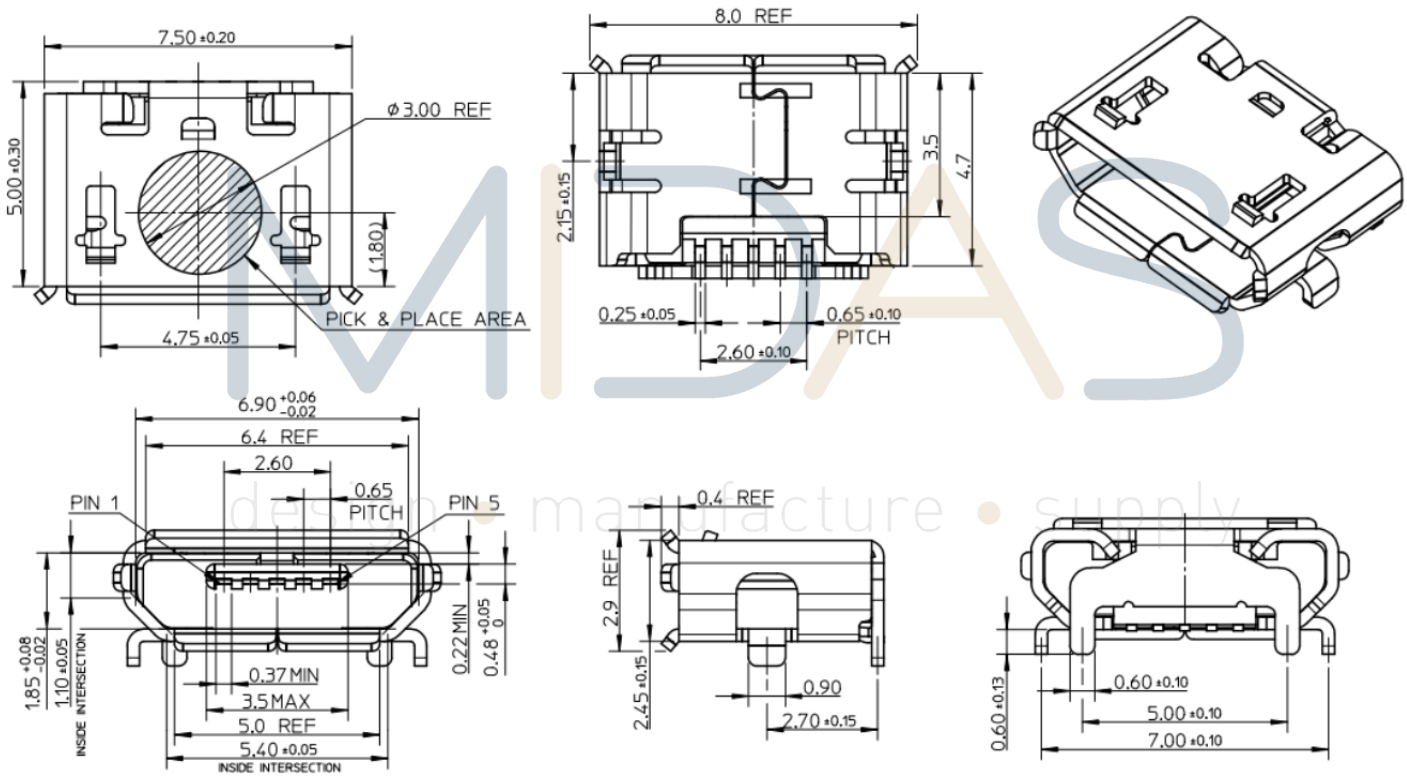
## Outline Dimension



## Input Terminal Pin Assignment

### MICRO USB 5V_2A(Typ.) PIN Definition & Signal Connector

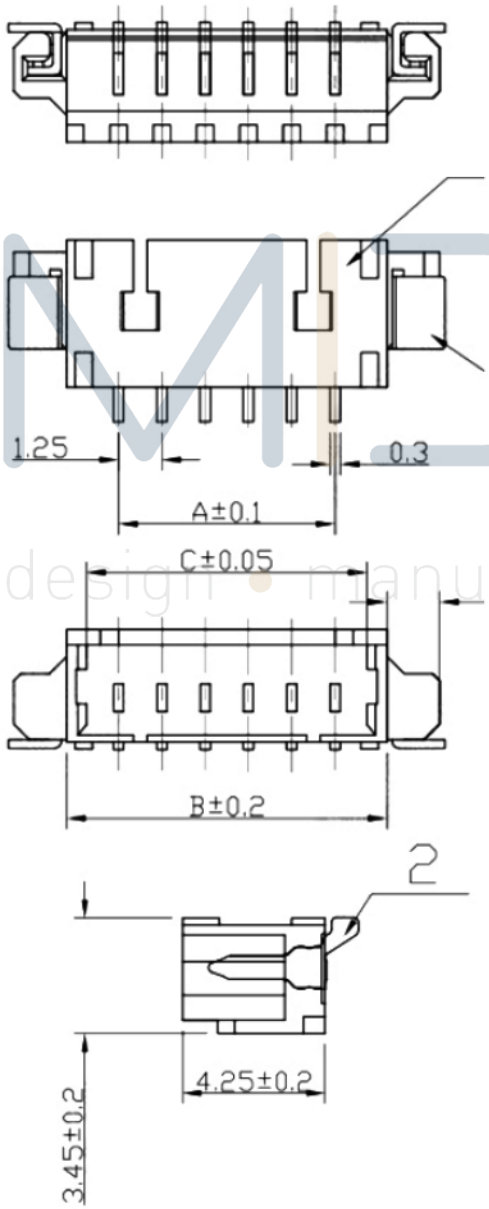
| NO. | SYMBOL | DISCRIPTION | I/O |
|---|---|---|---|
| 1 | DC:5V,2A(Typ.) | Supply voltage(5.0V,2A Typ.). | P |
| 2 | NC | No Connection. | I/O |
| 3 | NC | No Connection. | I/O |
| 4 | NC | No Connection. | I |
| 5 | GND | Ground. | P |



**Two speaker outputs PIN Define & Input Signal Connector**

note: SMT PH2.0mm spacing connector 4p

| NO. | SYMBOL | DISCRIPTION |
|---|---|---|
| 1 | Left channel+ | Audio output left channel |
| 2 | Left channel- | |
| 3 | Right channel- | Audio output right channel |
| 4 | Right channel+ | |

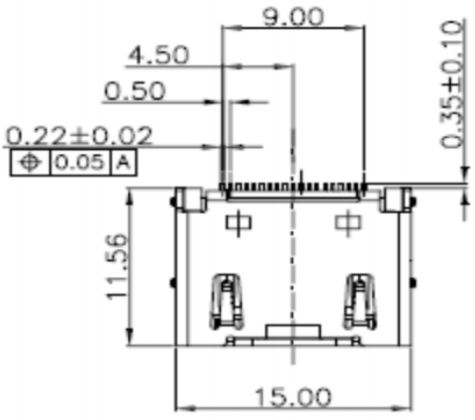


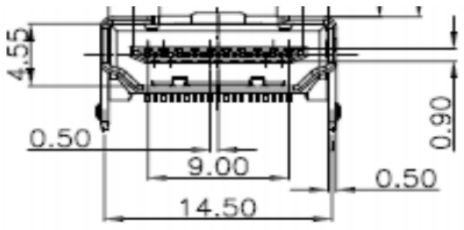

| N | A | B | C |
|---|---|---|---|
| 2 | 1.25 | 4.25 | 3.20 |
| 3 | 2.50 | 5.50 | 4.45 |
| 4 | 3.75 | 6.75 | 5.70 |
| 5 | 5.00 | 8.00 | 6.95 |
| 6 | 6.25 | 9.25 | 8.20 |
| 7 | 7.50 | 10.50 | 9.45 |
| 8 | 8.75 | 11.75 | 10.7 |
| 9 | 10.00 | 13.00 | 11.95 |
| 10 | 11.25 | 14.25 | 13.20 |
| 11 | 12.50 | 15.50 | 14.45 |
| 12 | 13.75 | 16.75 | 15.70 |
| 13 | 15.00 | 18.00 | 16.95 |
| 14 | 16.25 | 19.25 | 18.20 |
| 15 | 17.50 | 20.50 | 19.45 |
| 16 | 18.75 | 21.75 | 20.70 |
| 17 | 20.00 | 23.00 | 21.95 |
| 18 | 21.25 | 24.25 | 23.20 |
| 19 | 22.50 | 25.50 | 24.45 |
| 20 | 23.75 | 26.75 | 25.70 |
| 21 | 25.00 | 28.00 | 26.95 |
| 22 | 26.25 | 29.25 | 28.20 |
| 23 | 27.50 | 30.50 | 29.45 |
| 24 | 28.75 | 31.75 | 30.70 |
| 25 | 30.00 | 33.00 | 31.95 |

**HDMI PIN Defintion & Signal Connector**

| NO. | SYMBOL | DISCRIPTION | I/O |
|---|---|---|---|
| 1 | RX_D2+ | HDMI Receiver channel 2 positive analog input. | I |
| 2 | GND | Ground. | P |
| 3 | RX_D2- | HDMI Receiver channel 2 negative analog input. | I |
| 4 | RX_D1+ | HDMI Receiver channel 1 positive analog input. | I |
| 5 | GND | Ground. | P |
| 6 | RX_D1- | HDMI Receiver channel 1 negative analog input. | I |
| 7 | RX_D0+ | HDMI Receiver channel 0 positive analog input. | I |
| 8 | GND | Ground. | P |
| 9 | RX_D0- | HDMI Receiver channel 0 negative analog input. | I |
| 10 | RX_CLK+ | HDMI Receiver clock positive analog input. | I |
| 11 | GND | Ground. | P |
| 12 | RX_CLK- | HDMI Receiver clock negative analog input. | I |
| 13 | NC | No connect | |
| 14 | NC | No connect | |
| 15 | HDMI_SCL | HDMI Receiver DDC data channel. | I/O |
| 16 | HDMI_SDA | HDMI Receiver DDC clock channel. | I |
| 17 | GND | Ground. | P |
| 18 | HDMI_5V | HDMI Supply voltage (5.0V). | P |
| 19 | HPD | HDMI Receiver hot plug detect output | O |

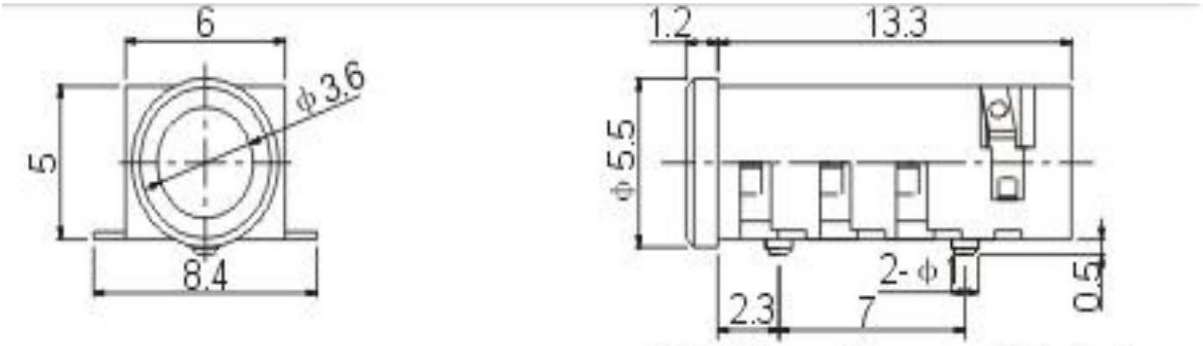
Note : HDMI Connector Dimension:



**Audio headphone socket PIN Define & Input Signal Connector**

| NO. | SYMBOL | DISCRIPTION |
|---|---|---|
| 1 | Left channel | Audio output left channel |
| 2 | Right channel | Audio output right channel |
| 3 | GND | Ground |
| 4 | GND | Ground |

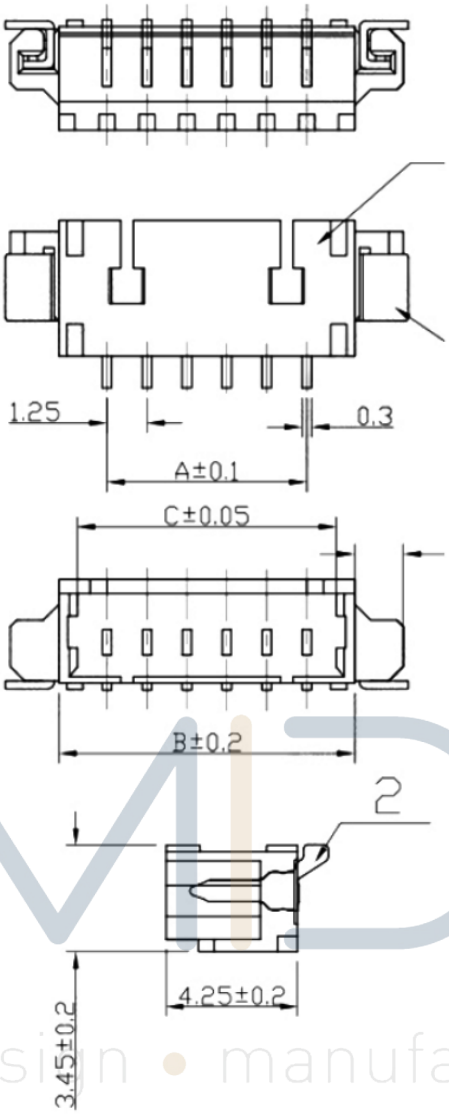


P.C.B Layout(copper-sided view)

**POWER ON/OFF AND Backlight PWM extensions key PIN Definition & Signal Connector**

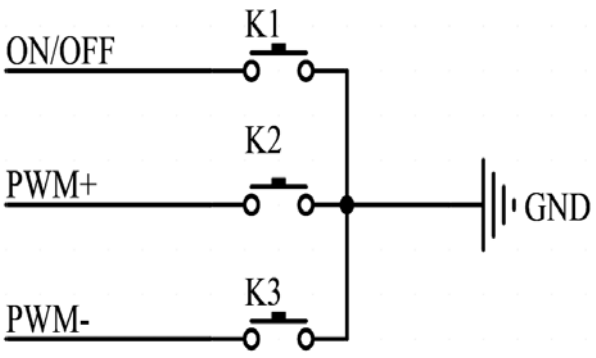
note: SMT PH2.0mm spacing connector 4p

| NO. | SYMBOL | DISCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | POWER ON/OFF | ON/OFF KEY |
| 3 | PWM+ | When the PWM+ button is pressed, the brightness of the backlight will increase by 1 level until the maximum brightness reaches 9 level. |
| 4 | PWM- | When PWM- button is pressed, the backlight brightness will decrease by 1 level until the minimum brightness reaches 0 level. |




| N | A | B | C |
|---|---|---|---|
| 2 | 1.25 | 4.25 | 3.20 |
| 3 | 2.50 | 5.50 | 4.45 |
| 4 | 3.75 | 6.75 | 5.70 |
| 5 | 5.00 | 8.00 | 6.95 |
| 6 | 6.25 | 9.25 | 8.20 |
| 7 | 7.50 | 10.50 | 9.45 |
| 8 | 8.75 | 11.75 | 10.7 |
| 9 | 10.00 | 13.00 | 11.95 |
| 10 | 11.25 | 14.25 | 13.20 |
| 11 | 12.50 | 15.50 | 14.45 |
| 12 | 13.75 | 16.75 | 15.70 |
| 13 | 15.00 | 18.00 | 16.95 |
| 14 | 16.25 | 19.25 | 18.20 |
| 15 | 17.50 | 20.50 | 19.45 |
| 16 | 18.75 | 21.75 | 20.70 |
| 17 | 20.00 | 23.00 | 21.95 |
| 18 | 21.25 | 24.25 | 23.20 |
| 19 | 22.50 | 25.50 | 24.45 |
| 20 | 23.75 | 26.75 | 25.70 |
| 21 | 25.00 | 28.00 | 26.95 |
| 22 | 26.25 | 29.25 | 28.20 |
| 23 | 27.50 | 30.50 | 29.45 |
| 24 | 28.75 | 31.75 | 30.70 |
| 25 | 30.00 | 33.00 | 31.95 |





## Operating Instructions:

1. This product supports the following operating systems: Windows 7/8/10,, Andriod.

2. Connect the HDMI cable to Windows 7/8/10 or Andriod.

3. Connect the micro USB DC POWER.

## LCD Optical Characteristics

### 1 Optical specification

| Item | | Symbol | Condition | Min. | Typ. | Max. | Unit. | Note |
|---|---|---|---|---|---|---|---|---|
| Contrast Ratio | | CR | Θ=0 Normal viewing angle | 640 | 800 | -- | | *(1)(2) |
| Response time | Rising | $T_{R+}T_F$ | | -- | 25 | 35 | msec | *(1)(3) |
| | Falling | | | | | | | |
| Uniformity | | S(%) | | 55 | 60 | -- | % | * |
| Color Filter Chromacicity | White | $W_X$ | | 0.269 | 0.309 | 0.349 | | CA-310 Test |
| | | $W_Y$ | | 0.310 | 0.350 | 0.390 | | |
| | Red | $R_X$ | | 0.571 | 0.611 | 0.651 | | |
| | | $R_Y$ | | 0.323 | 0.363 | 0.403 | | |
| | Green | $G_X$ | | 0.277 | 0.317 | 0.357 | | |
| | | $G_Y$ | | 0.530 | 0.570 | 0.610 | | |
| | Blue | $B_X$ | | 0.110 | 0.150 | 0.190 | | |
| | | $B_Y$ | | 0.060 | 0.100 | 0.140 | | |
| Viewing angle | Hor. | ΘL | CR>10 | 70 | 80 | -- | | *(1)(4) |
| | | ΘR | | 70 | 80 | -- | | |
| | Ver. | ΘU | | 70 | 80 | -- | | |
| | | ΘD | | 70 | 80 | -- | | |

*The data comes from the LCD specification.

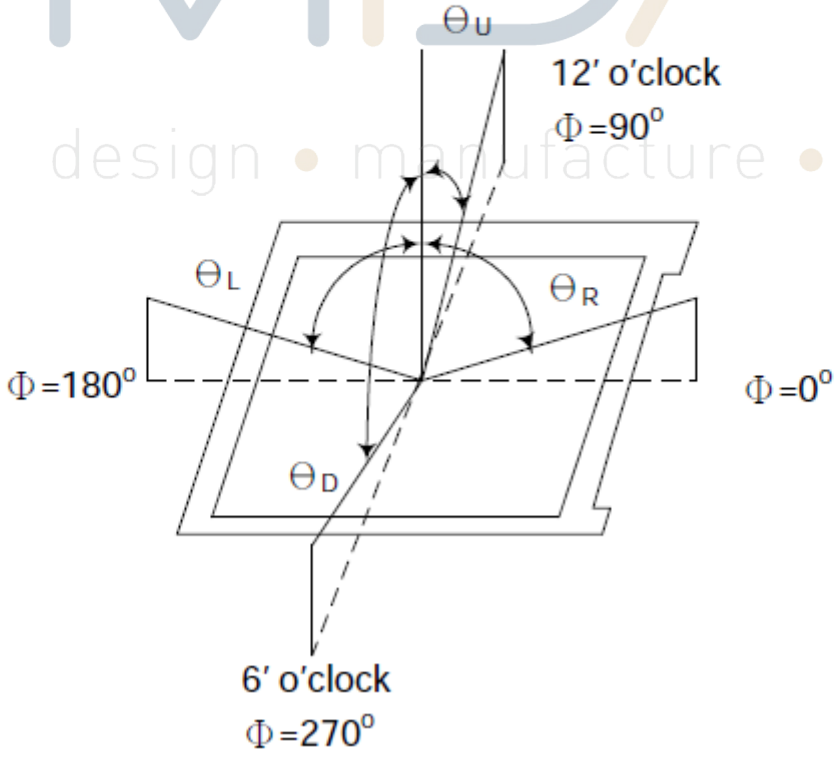
## 2 Measuring Condition

- Measuring surrounding：dark room
- Ambient temperature：25±2℃
- 15min. warm-up time.

### Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

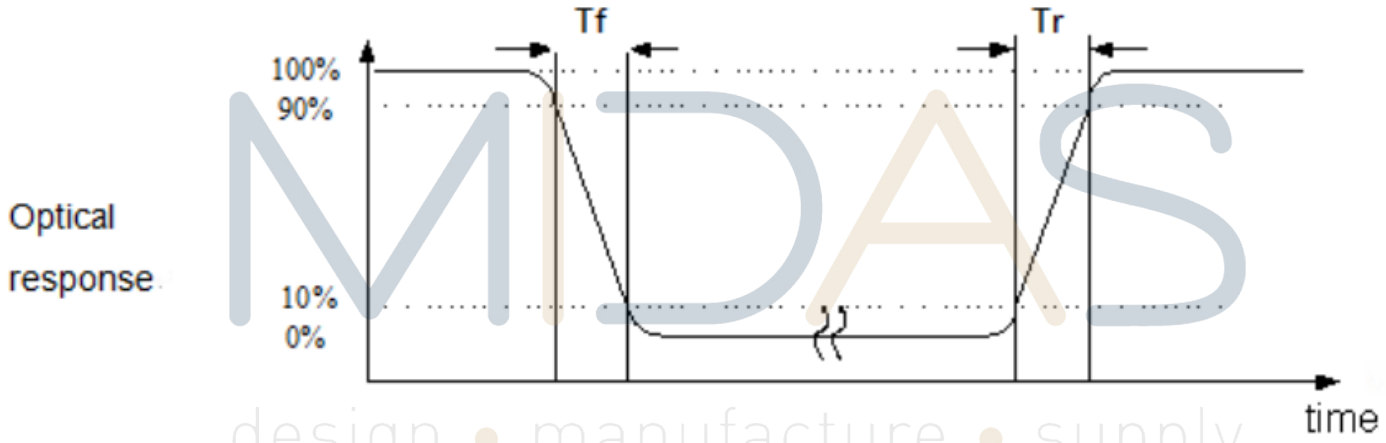
Note (1) Definition of Viewing Angle:



Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

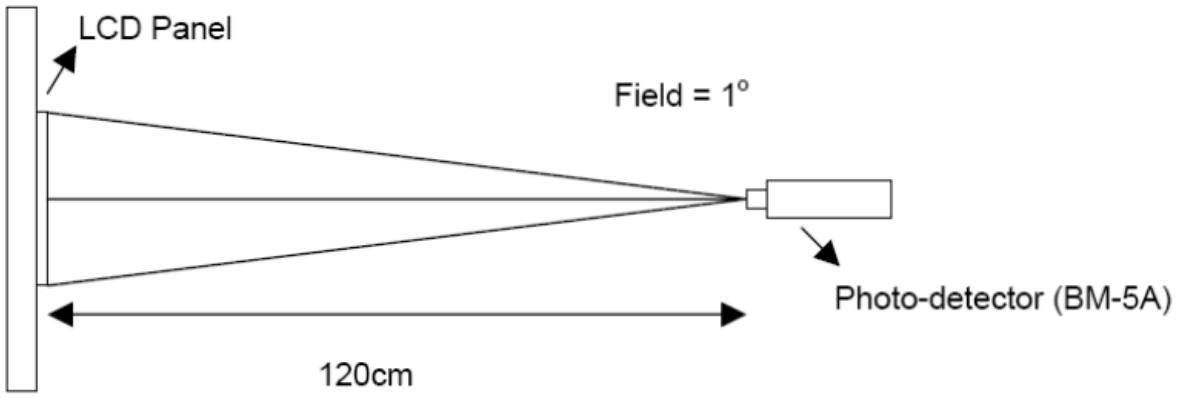
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of $T_R$ and $T_F$






Note (4) Definition of optical measurement setup



# Electrical Characteristics:

## 1 Absolute Maximum Rating (Ta=25 VSS=0V)

| Characteristics | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Digital Supply Voltage | VCI | -0.3 | 4.6 | **V** |
| Digital interface supple Voltage | IOVCC | -0.3 | 3.3 | **V** |
| Operating temperature | $T_{OP}$ | -20 | +70 | ℃ |
| Storage temperature | $T_{ST}$ | -30 | +80 | ℃ |

NOTE: If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged. Be sure to use the product within the range of the absolute maximum ratings.



## 2 DC Electrical Characteristics

| Characteristics | Symbol | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|
| Digital Supply Voltage | VCI | 2.5 | 2.8/3.3 | 3.6 | V | |
| Digital interface supple Voltage | IOVCC | 1.65 | 1.8 | 3.3 | V | |
| Normal mode Current consumption | IDD | -- | 30 | -- | mA | |
| Level input voltage | $V_{IH}$ | 0.7IOVCC | | IOVCC | V | |
| | $V_{IL}$ | GND | | 0.3IOVCC | V | |
| Level output voltage | $V_{OH}$ | 0.8IOVCC | | IOVCC | V | |
| | $V_{OL}$ | GND | | 0.2IOVCC | V | |

# LCD Module Out-Going Quality Level

## 1 VISUAL & FUNCTION INSPECTION STANDARD

### .1 Inspection conditions

Inspection performed under the following conditions is recommended.

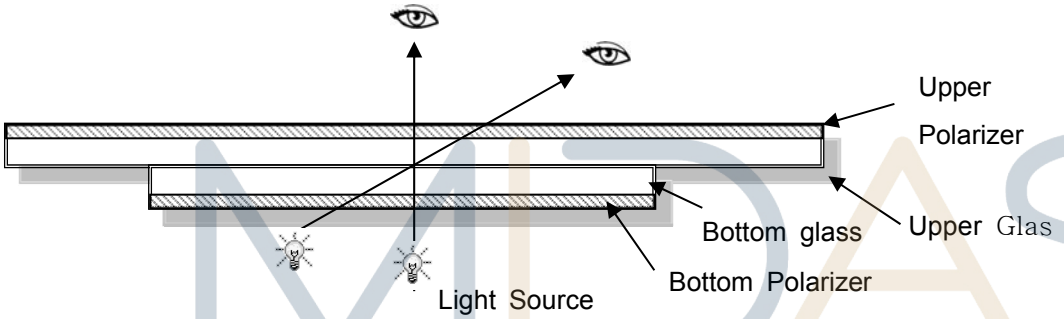
Temperature : 25±5℃

Humidity : 65%±10%RH

Viewing Angle : Normal viewing Angle.

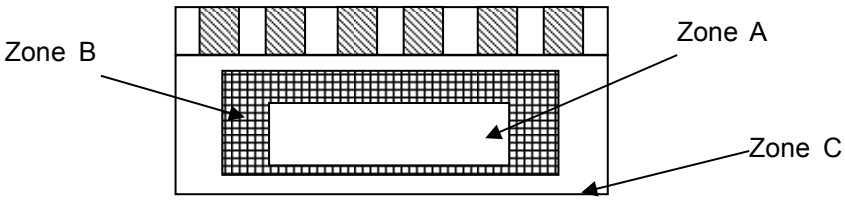
Illumination: Single fluorescent lamp (300 to 700Lux)

Viewing distance:30-50cm






### 1.2 Definition




Zone A : Effective Viewing Area(Character or Digit can be seen)

Zone B : Viewing Area except Zone A

Zone C : Outside (Zone A+Zone B) which can not be seen after assembly by customer .)

Note:

As a general rule ,visual defects in Zone C can be ignored when it doesn't effect product function or appearance after assembly by customer.

## 1.3 Sampling Plan

According to GB/T 2828-2003 ; , normal inspection, Class Ⅱ

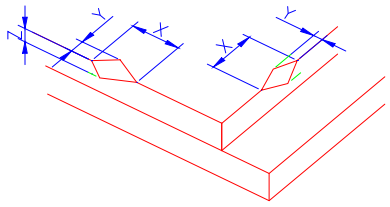
AQL:

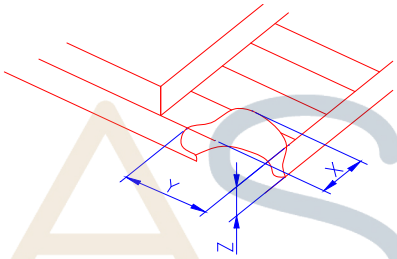
| Major defect | Minor defect |
|---|---|
| 0.65 | 1.5 |

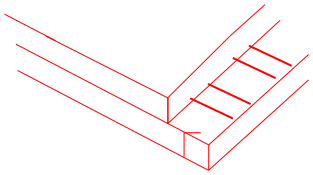
LCD: Liquid Crystal Display , TP: Touch Panel , LCM: Liquid Crystal Module

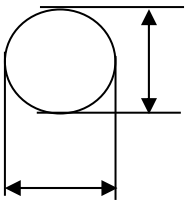
| No | Items to be inspected | Criteria | Classification of defects |
|---|---|---|---|
| 1 | Functional defects | 1) No display, Open or miss line<br>2) Display abnormally, Short<br>3) Backlight no lighting, abnormal lighting.<br>4) TP no function | Major |
| 2 | Missing | Missing component | |
| 3 | Outline dimension | Overall outline dimension beyond the drawing is not allowed | |
| 4 | Color tone | Color unevenness, refer to limited sample | Minor |
| 5 | Soldering appearance | Good soldering , Peeling off is not allowed. | |
| 6 | LCD/Polarizer/TP | Black/White spot/line, scratch, crack, etc. | |

## 1.4 Criteria (Visual)

<table>
<tr><th>Number</th><th>Items</th><th>Criteria(mm)</th></tr>
<tr><td rowspan="3">1.0 LCD Crack/Broken<br><br>NOTE:<br>X: Length<br>Y: Width<br>Z: Height<br>L: Length of I TO,<br>T: Height of L CD</td><td>(1) The edge of LCD broken</td><td> 

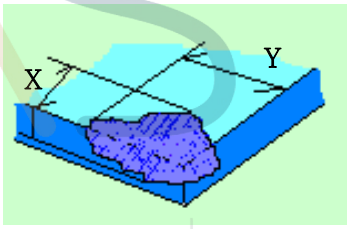
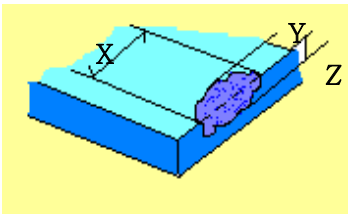
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≤3.0mm</td><td><Inner border line of the seal</td><td>≤T</td></tr>
</table></td></tr>
<tr><td>(2)LCD corner broken</td><td> 

<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≤3.0mm</td><td>≤L</td><td>≤T</td></tr>
</table></td></tr>
<tr><td>(3) LCD crack</td><td>  <br>Crack<br>Not allowed</td></tr>
</table>

<table>
<tr><th>Number</th><th>Items</th><th>Criteria (mm)</th></tr>
<tr><td>2.0</td><td>Spot defect<br>  <br>Y<br>X<br>Φ=(X+Y)/2</td><td>① light dot（LCD/TP/Polarizer black/white spot , light dot, pinhole, dent, stain）
<table>
<tr><th rowspan="2">Zone<br>Size (mm)</th><th colspan="3">Accep</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.30</td><td colspan="2">Ignore</td><td rowspan="4">Ignor</td></tr>
<tr><td>0.20<Φ≤0.3</td><td colspan="2">3( distance≧10mm)</td></tr>
<tr><td>0.25<Φ≤0.35</td><td colspan="2">2</td></tr>
<tr><td>Φ＞0.4</td><td colspan="2">0</td></tr>
</table>
②Dim spot（LCD/TP/Polarizer dim dot, light leakage、dark spot）
<table>
<tr><th rowspan="2">Zone<br>Size (mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.3</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.2<Φ≤0.3</td><td colspan="2">3( distance≧10mm)</td></tr>
<tr><td>0.25<Φ≤0.35</td><td colspan="2">2</td></tr>
<tr><td>Φ＞0.4</td><td colspan="2">0</td></tr>
</table>
③ Polarizer accidented spot
<table>
<tr><th rowspan="2">Zone<br>Size (mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.3</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.25<Φ≤0.5</td><td colspan="2">2( distance≧10mm)</td></tr>
<tr><td>Φ>0.5</td><td colspan="2">0</td></tr>
</table></td></tr>
<tr><td></td><td>Line defect (LCD/TP /Polarizer black/white line, scratch, stain)</td><td>
<table>
<tr><th rowspan="2">Width(mm)</th><th rowspan="2">Length(mm</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.05</td><td>Igno</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.04<W≤0.07</td><td>L≤3.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.06<W≤0.09</td><td>L≤2.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.09<W</td><td colspan="4">Define as spot defect</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>3.0</td><td>Polarizer Bubble</td><td>
<table>
<tr><td rowspan="2">Zone<br>Size (mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.2</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.2<Φ≤0.4</td><td colspan="2">3(distance≧10</td></tr>
<tr><td>0.4<Φ≤0.6</td><td colspan="2">2</td></tr>
<tr><td>0.6<Φ</td><td colspan="2">0</td></tr>
</table>
</td></tr>
<tr><td>4.0</td><td>SMT</td><td>According to IPC-A-610C class Ⅱ standard . Function defect and missing part are major defect ,the others are minor defect.</td></tr>
</table>

<table>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>TP bubble/ accidented spot</td><td>
<table>
<tr><td rowspan="2">Size Φ(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.3</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.25<Φ≤0.3</td><td colspan="2">3（distance≧10m</td></tr>
<tr><td>0.25<Φ≤0.35</td><td colspan="2">2</td></tr>
<tr><td>0.4<Φ</td><td colspan="2">0</td></tr>
</table>
</td></tr>
<tr><td>Assembly deflection</td><td>beyond the edge of backlight ≤0.15mm</td></tr>
</table>

<table>
<tr>
<td rowspan="3">5.0</td>
<td rowspan="3">TP Related</td>
<td>Newton Ring</td>
<td>Newton Ring area>1/3 TP area NG<br>Newton Ring area≤1/3 TP area OK</td>
<td> 
</td>
</tr>
<tr>
<td>TP corner broken<br>X：length<br>Y：width<br>Z：height</td>
<td><table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>X≤3.0mm</td><td>Y≤3.0mm</td><td>Z<LCD thickness</td></tr>
</table>
* Circuitry broken is not allowed.</td>
<td> 
</td>
</tr>
<tr>
<td>TP edge broken<br>X：length<br>Y：width<br>Z：height</td>
<td><table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>X≤6.0mm</td><td>Y≤2.0mm</td><td>Z<LCD thickness</td></tr>
</table>
* Circuitry broken is not allowed.</td>
<td> 
</td>
</tr>
</table>

Criteria ( functional items)

| Number | Items | Criteria (mm) |
|---|---|---|
| 1 | No display | Not allowed |
| 2 | Missing segment | Not allowed |
| 3 | Short | Not allowed |
| 4 | Backlight no lighting | Not allowed |
| 5 | TP no function | Not allowed |

## Reliability Test Results

| Item | Condition | Inspection after test |
|---|---|---|
| High Temperature Operating | 70℃,96H | Inspection after 2~4hours storage at room temperature, the sample shall be free from defects:<br>1.Air bubble in the LCD;<br>2.Non-display;<br>3.Missing segments/line;<br>4.Glass crack;<br>5.Current IDD is twice higher than initial value. |
| Low Temperature Operating | -20℃, 96HR | |
| High Temperature Storage | 80℃, 96HR | |
| Low Temperature Storage | -30℃, 96HR | |
| High Temperature & High Humidity Operating | +60℃, 90% RH ,96 hours. | |
| Thermal Shock (Non-operation) | -30℃,30 min ↔ 80℃,30 min,<br>Change time:5min 20CYC. | |
| ESD test | C=150pF, R=330,5points/panel<br>Air:±8KV, 5times; Contact:±6KV, 5 times;<br>(Environment: 15℃~35℃, 30%~60%). | |
| Vibration (Non-operation) | Frequency range:10~55Hz, Stroke:1.5mm<br>Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition). | |
| Box Drop Test | 1 Corner 3 Edges 6 faces,80㎝(MEDIUM BOX) | |

Remark:

1.The test samples should be applied to only one test item.

2.Sample size for each test item is 5~10pcs.

3.For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used.

4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

5.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

# Cautions and Handling Precautions

## 1 Handling and Operating the Module

(1) When the module is assembled, it should be attached to the system firmly.
Do not warp or twist the module during assembly work.
(2) Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
(3) Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.
(4) Do not allow drops of water or chemicals to remain on the display surface.
If you have the droplets for a long time, staining and discoloration may occur.
(5) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
(6) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.
Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.
(8) Protect the module from static; it may cause damage to the CMOS ICs.
(9) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
(10) Do not disassemble the module.
(11) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
(12) Pins of I/F connector shall not be touched directly with bare hands.
(13) Do not connect, disconnect the module in the “Power ON” condition.
(14) Power supply should always be turned on/off by the item 6.1 Power On Sequence &6.2 Power Off Sequence



## 2 Storage and Transportation.

(1) Do not leave the panel in high temperature, and high humidity for a long time.
It is highly recommended to store the module with temperature from 0 to 35 ℃ and relative humidity of less than 70%
(2) Do not store the TFT-LCD module in direct sunlight.
(3) The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.
(4) It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module.
In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

(5) This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.