# Specification for Approval

Customer:_____

Model Name:_____

| Supplier Approval | | | Customer approval |
|---|---|---|---|
| R&D Designed | R&D Approved | QC Approved | |
| Peter | Peng Jun | | |

# Revision Record

| REV NO. | REV DATE | CONTENTS | Note |
|---|---|---|---|
| A | 2016-07-13 | NEW ISSUE | |
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# Table of Contents

## 1. Scope

This specification defines general provisions as well as inspection standards for TFT module supplied by AMSON electronics.

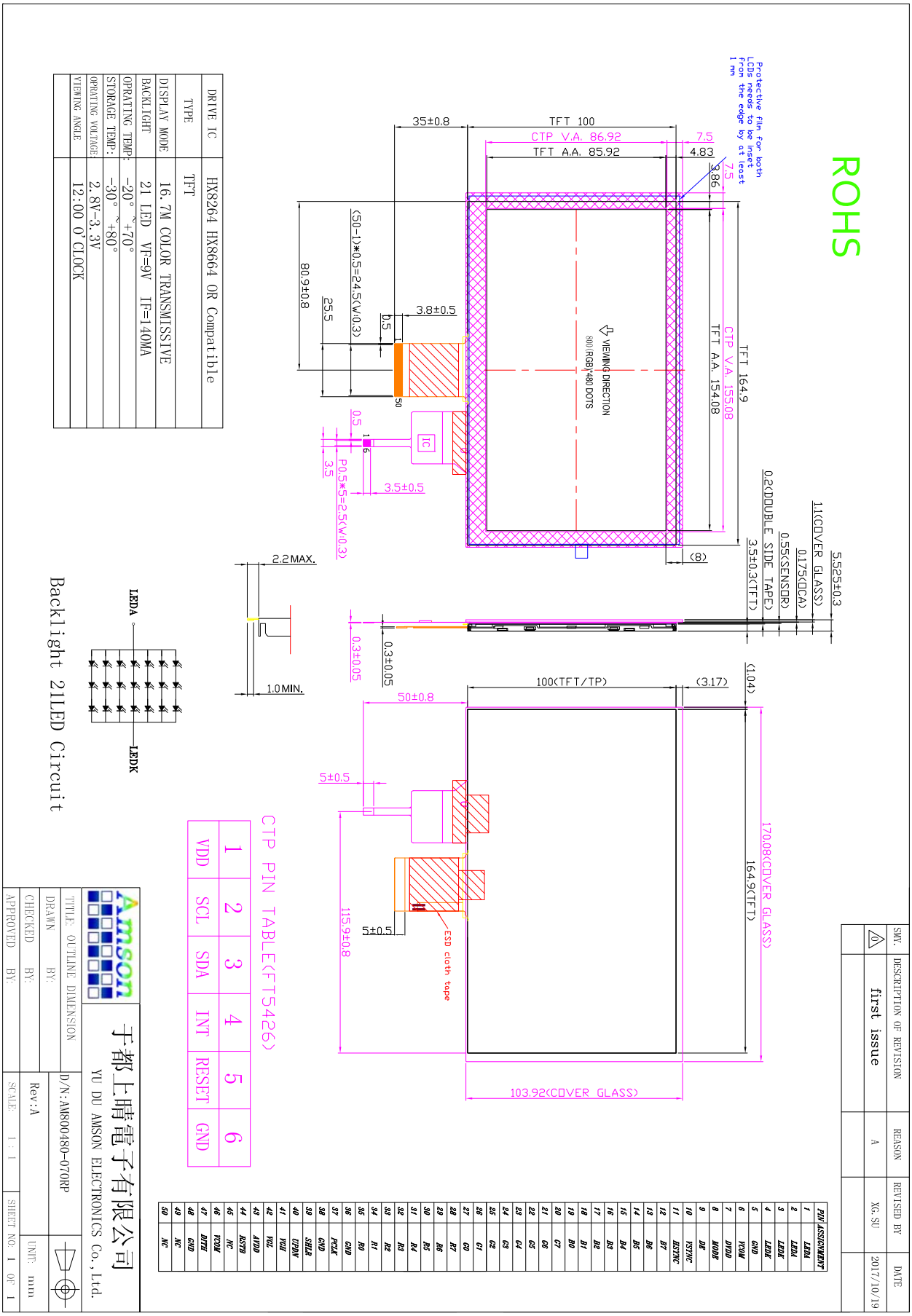
If the event of unforeseen problem or unspecified items may occur, naturally shall negotiate and agree to solution

## 2. General Information

### LCM

| ITEM | STANDARD VALUES | UNITS |
|---|---|---|
| LCD type | 7.0”TFT | -- |
| Dot arrangement | 800×3(RGB)×480 | dots |
| Color filter array | RGB vertical stripe | -- |
| Display mode | TN / Transmissive / Normally white | - |
| Gray Scale Inversion Direction | 6 o’clock | -- |
| Eyes Viewing Direction | 12 o’clock | |
| Module size | 170.8W)×103.92(H)×5.525(T) | mm |
| Active area | 154.08(W)×85.92(H) | mm |
| Dot pitch | 0.1926(W)×0.1790(H) | mm |
| Interface | 24-bit Parallel RGB Interface | -- |
| Operating temperature | -20 ~ +70 | °C |
| Storage temperature | -30 ~ +80 | °C |
| Back Light | 21 White LEDS | -- |
| Weight | TBD | g |

## 3. External Dimensions



## 4. Interface Description

| PIN | PIN NAME | DESCRIPTION |
|---|---|---|
| 1 | LEDA | LED backlight (Anode). |
| 2 | LEDA | |
| 3 | LEDK | LED backlight (Cathode). |
| 4 | LEDK | |
| 5 | GND | Power ground |
| 6 | VCOM | Common Voltage. |
| 7 | DVDD | Digital Power. |
| 8 | MODE | DE/SYNC mode select. Normally pull high.<br>H: DE mode. L: HSD/VSD mode. |
| 9 | DE | Data Enable signal. |
| 10 | VSYNC | Vertical sync input. Negative polarity. |
| 11 | HSYNC | Horizontal sync input. Negative polarity. |
| 12 | B7 | Blue Data Input (MSB). |
| 13 | B6 | Blue Data Input. |
| 14 | B5 | Blue Data Input. |
| 15 | B4 | Blue Data Input. |
| 16 | B3 | Blue Data Input. |
| 17 | B2 | Blue Data Input. |
| 18 | B1 | Blue Data Input. |
| 19 | B0 | Blue Data Input (LSB). |
| 20 | G7 | Green Data Input (MSB). |
| 21 | G6 | Green Data Input. |
| 22 | G5 | Green Data Input. |
| 23 | G4 | Green Data Input. |
| 24 | G3 | Green Data Input. |
| 25 | G2 | Green Data Input. |
| 26 | G1 | Green Data Input. |
| 27 | G0 | Green Data Input (LSB). |
| 28 | R7 | Red Data Input (MSB). |
| 29 | R6 | Red Data Input. |
| 30 | R5 | Red Data Input. |
| 31 | R4 | Red Data Input. |
| 32 | R3 | Red Data Input. |
| 33 | R2 | Red Data Input. |
| 34 | R1 | Red Data Input. |
| 35 | R0 | Red Data Input (LSB). |
| 36 | GND | Power ground. |
| 37 | PCLK | Clock input. |
| 38 | GND | Power ground. |

| | | |
|---|---|---|
| 39 | SHLR | Left or Right Display Control. |
| 40 | UPDN | Up / Down Display Control. |
| 41 | VGH | Positive Power for TFT. |
| 42 | VGL | Negative Power for TFT. |
| 43 | AVDD | Analog Power. |
| 44 | RSTB | Global reset pin. Active low to enter reset state.<br>Suggest to connecting with an RC reset circuit for stability.<br>Normally pull high.(R=10KΩ, C=1μF) |
| 45 | NC. | Not connect. |
| 46 | VCOM | Common Voltage. |
| 47 | DITH | Dithering function enable control. (Normally pull high)<br>DITH="L", to enable internal dithering function.<br>DITH="H", to disable internal dithering function. |
| 48 | GND | Power ground. |
| 49 | NC. | Not connect. |
| 50 | NC. | Not connect. |

MODE: H = DE mode (default)

L = HSD/VSD mode

DITH: H = 6 bit resolution (last 2 bit of input data truncated)

L = 8 bit resolution (default setting)

SHLR: 0 = right to left scan direction

1 = left to right scan direction

UPDN: 0 = top to bottom scan direction

1 = bottom to top scan direction

**CTP**

| PIN NO. | PIN NAME | |
|---|---|---|
| 1 | VDD | CTP Digital Power. |
| 2 | SCL | CTP $I^2C$_clock. |
| 3 | SDA | CTP $I^2C$_data |
| 4 | INT | CTP interruption signal. |
| 5 | RESET | CTP reset pin. Active low to enter reset state. |
| 6 | GND | CTP Power ground |

## 5. Absolute Maximum Ratings

| Item | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Digital Supply Voltage | DVDD | -0.3 | 5.0 | V |
| CTP Supply Voltage | VDD | 1.8 | 3.6 | V |
| Gate On Voltage | VGH | -0.3 | 40.0 | V |
| Gate Off Voltage | VGL | -20.0 | 0.3 | V |
| Gate On- Gate Off Voltage | VGH-VGL | - | 40.0 | V |
| Operating Temperature | TOP | -20 | 70 | °C |
| Storage Temperature | TST | -30 | 80 | °C |
| Storage Humidity | HD | 20 | 90 | %RH |

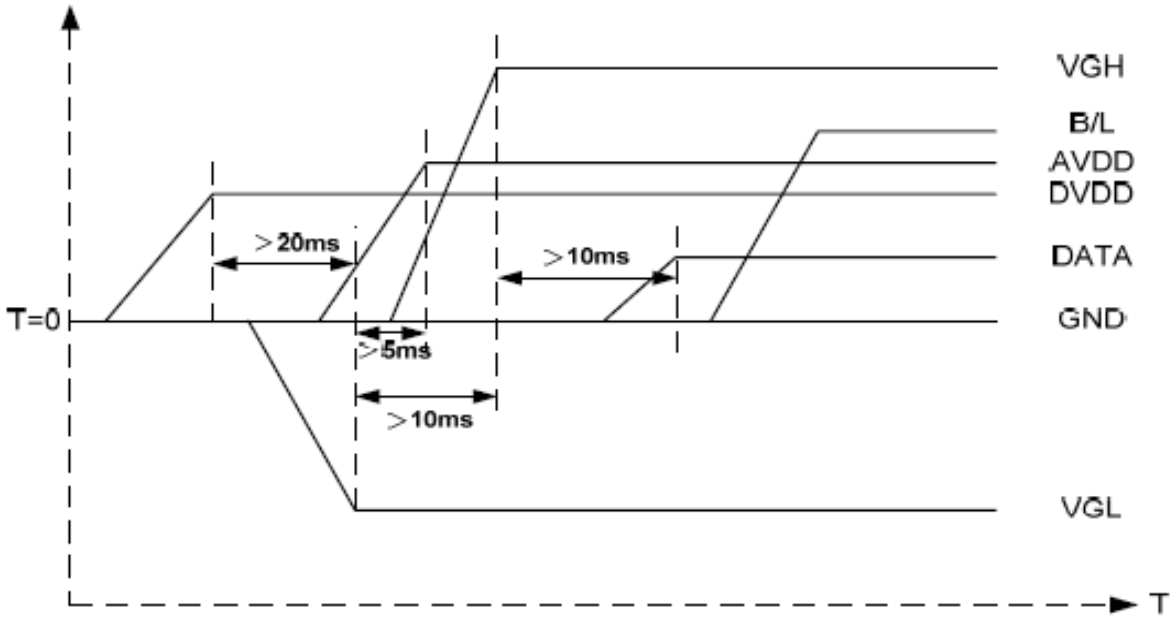
## 6. DC Characteristics

| Item | Symbol | Min. | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|
| Digital Supply Voltage | DVDD | 3.0 | 3.3 | 3.6 | V | - |
| CTP Supply Voltage | VDD | 2.8 | | 3.6 | V | |
| Analog Supply Voltage | AVDD | 9.4 | 9.6 | 9.8 | V | - |
| Gate On Voltage | VGH | 17.0 | 18.0 | 19.0 | V | - |
| Gate Off Voltage | VGL | -6.6 | -6.0 | -5.4 | V | - |
| Common Voltage | VCOM | 3.5 | 4.0 | 4.5 | V | - |
| Logic Input Voltage | VIH | 0.7DVDD | - | DVDD | V | - |
| | VIL | GND | - | 0.3DVDD | V | - |

## 7. Timing Characteristics

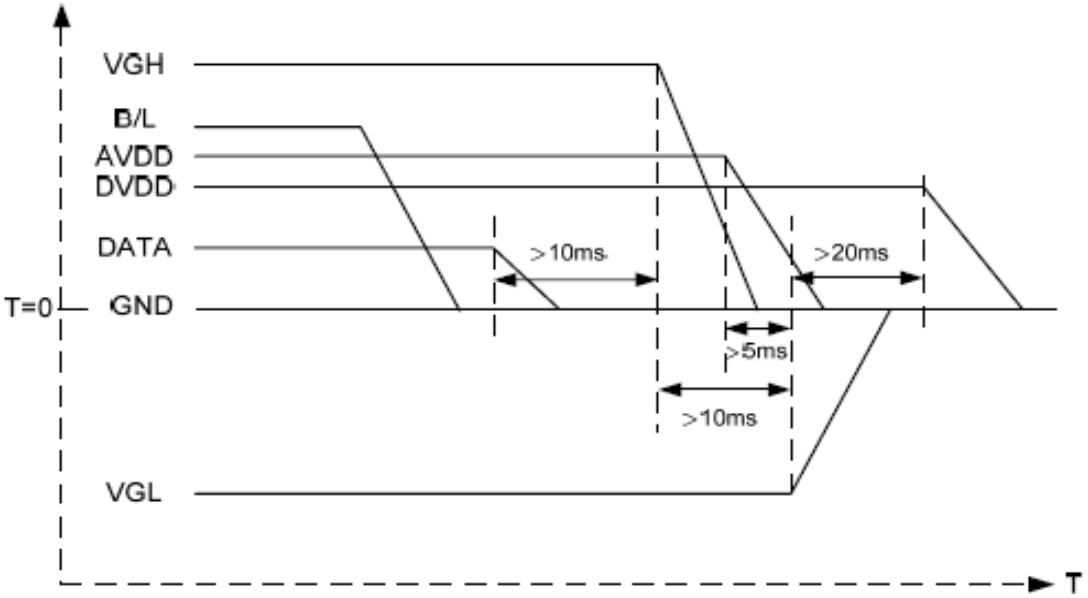
### 7.1 Power sequence

**a. Power on:**




**$DV_{DD}$→VGL→VGH→Data→B/L**

**b. Power off:**

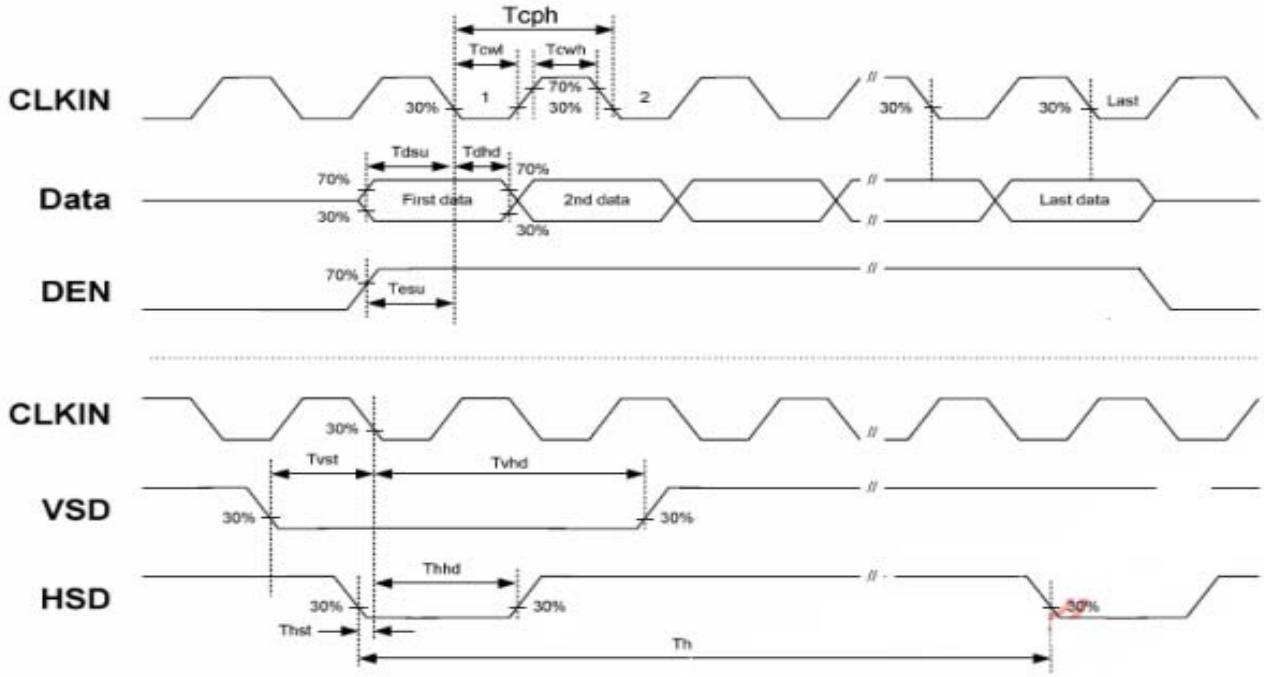



**B/L→Data→VGH→VGL→$DV_{DD}$**

Note: Data include R0~R7, B0~B7, GO~G7, U/D, L/R, DCLK, HS,VS,DE.

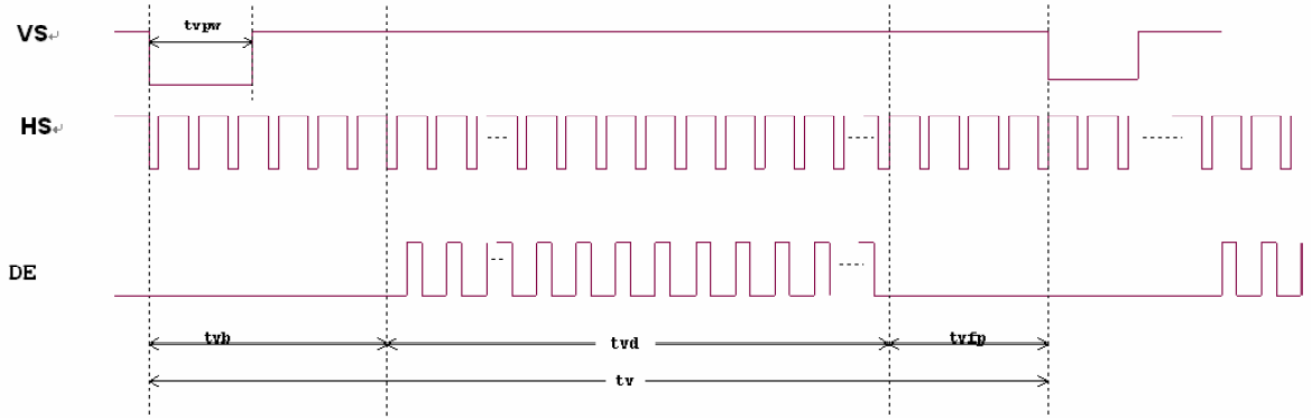
### 7.2 Timing characteristics
### 7.2.1 AC Electrical Characteristics

| Item | Symbol | Values | | | Unit | Remark |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| HS setup time | $T_{hst}$ | 8 | - | - | ns | |
| HS hold time | $T_{hhd}$ | 8 | - | - | ns | |
| VS setup time | $T_{vst}$ | 8 | - | - | ns | |
| VS hold time | $T_{vhd}$ | 8 | - | - | ns | |
| Data setup time | $T_{dsu}$ | 8 | - | - | ns | |
| Data hole time | $T_{dhd}$ | 8 | - | - | ns | |
| DE setup time | $T_{esu}$ | 8 | - | - | ns | |
| DE hole time | $T_{ehd}$ | 8 | - | - | ns | |
| $DV_{DD}$ Power On Slew rate | $T_{POR}$ | - | - | 20 | ms | From 0 to 90% $DV_{DD}$ |
| RESET pulse width | $T_{Rst}$ | 1 | - | - | ms | |
| DCLK cycle time | $T_{coh}$ | 20 | - | - | ns | |
| DCLK pulse duty | $T_{cwh}$ | 40 | 50 | 60 | % | |



### 7.2.2 Data Input Format


**Horizontal input timing diagram**




**Vertical input timing diagram**

### 7.2.3 Timing

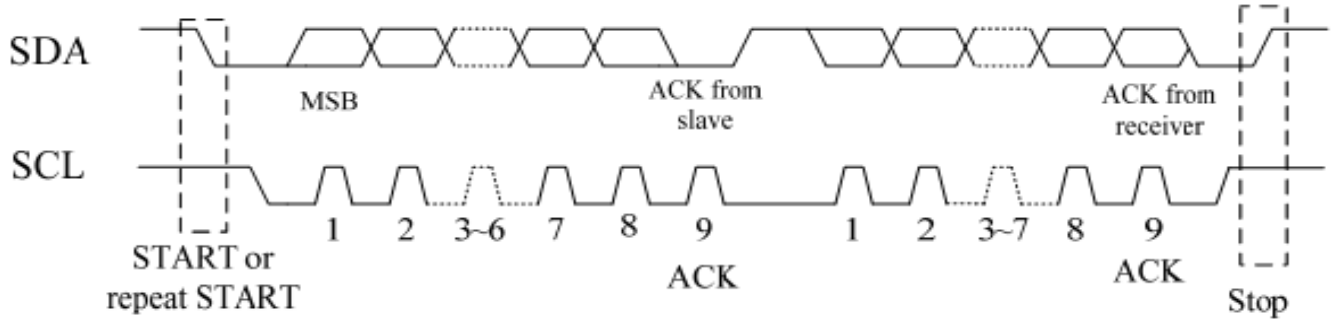
#### 7.2.3.1 Horizontal timing

| Parameter | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| Horizontal Display Area | thd | - | 800 | - | DCLK |
| DCLK frequency | fclk | - | 33.3 | 50 | MHz |
| One Horizontal Line | th | 862 | 1056 | 1200 | DCLK |
| HS pulse width (Min.) | thpw | | 1 | | DCLK |
| HS pulse width (Typical.) | thpw | | - | | DCLK |
| HS pulse width (Max.) | thpw | | 40 | | DCLK |
| HS Back Porch (Blanking) | thb | 46 | 46 | 46 | DCLK |
| HS Front Porch | thfp | 16 | 210 | 354 | DCLK |
| DE mode Blanking | th-thd | 45 | 256 | 400 | DCLK |

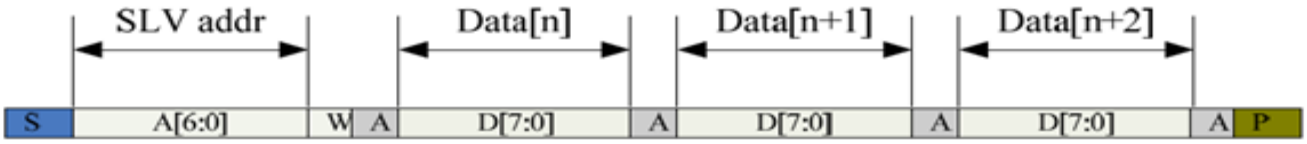
#### 7.2.3.2 Vertical timing

| Parameter | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| Vertical Display Area | tvd | | 480 | | TH |
| VS period time | tv | 510 | 525 | 650 | TH |
| VS pulse width | tvpw | 1 | - | 20 | TH |
| VS Back Porch (Blanking) | tvb | 23 | 23 | 23 | TH |
| VS Front Porch | tvfp | 7 | 22 | 147 | TH |
| DE mode Blanking | tv-tvd | 4 | 45 | 170 | TH |

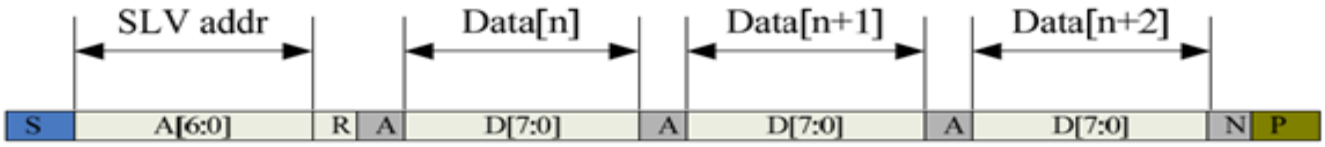
### 7.3 CTP Timing Characteristics
### 7.3.1 Serial Interface




I²C Serial Data Transfer Format




I²C master write, slave read




I²C master read, slave write

## Mnemonics Description

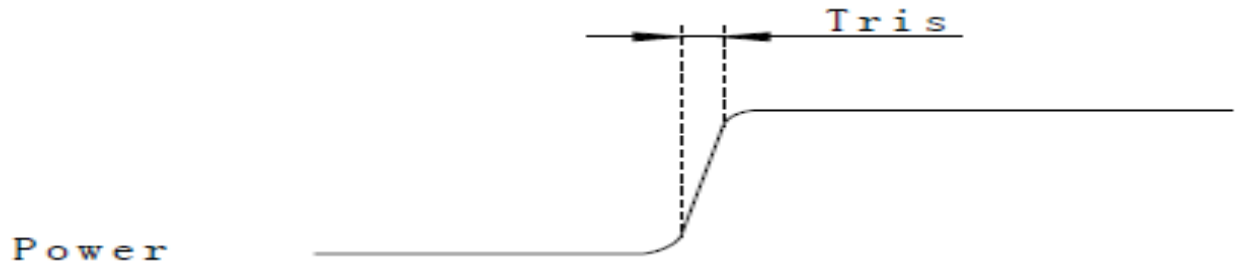
| Mnemonics | Description |
|---|---|
| S | I2C Start or I2C Restart |
| A[6:0] | Slave address<br>A[6:0]: address bits are identical to those of I2CADDR [7:1] register. |
| R/ W | '1' for read, '0'for write |
| A(N) | ACK(NACK) |
| P | STOP: the indication of the end of a packet (if this bit is missing, S will indicate the end of the current packet and the beginning of the next packet) |

## Timing Characteristics

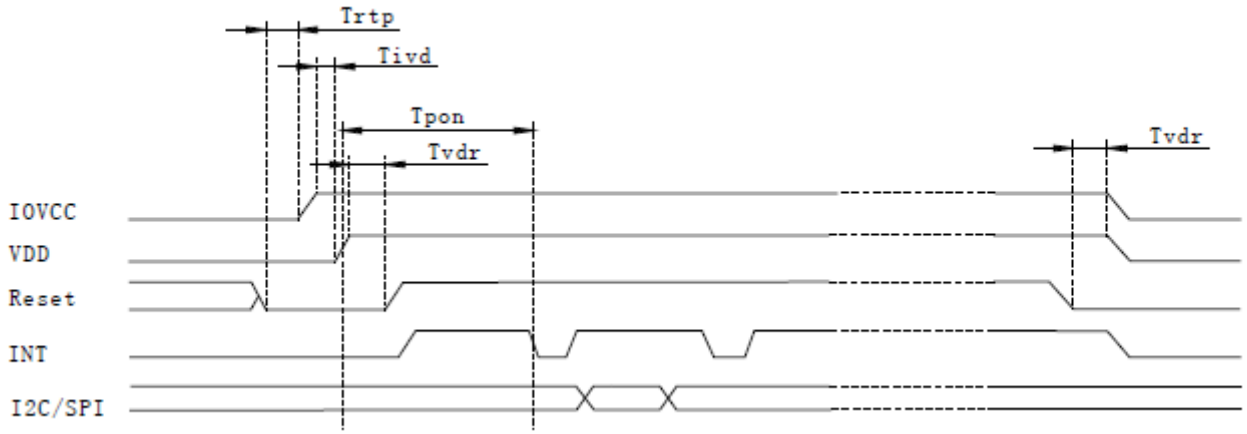
| Parameter | Unit | Min | Max |
|---|---|---|---|
| SCL frequency | KHz | 0 | 400 |
| Bus free time between a STOP and START condition | us | 4.7 | \ |
| Hold time (repeated) START condition | us | 4.0 | \ |
| Data setup time | ns | 250 | \ |
| Setup time for a repeated START condition | us | 4.7 | \ |
| Setup Time for STOP condition | us | 4.0 | \ |

### 7.3.2 POWER NO /Reset/Wake Sequence

Reset should be pulled down to be low before powering on and powering down. INT signal will be sent to the host after initializing all parameters and then start to report points to the host.

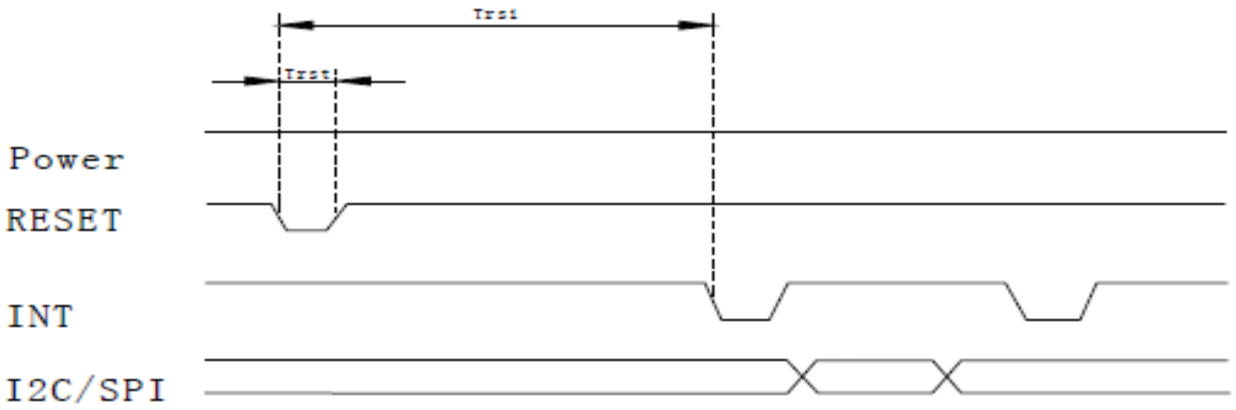



Power on time




Power on Sequence

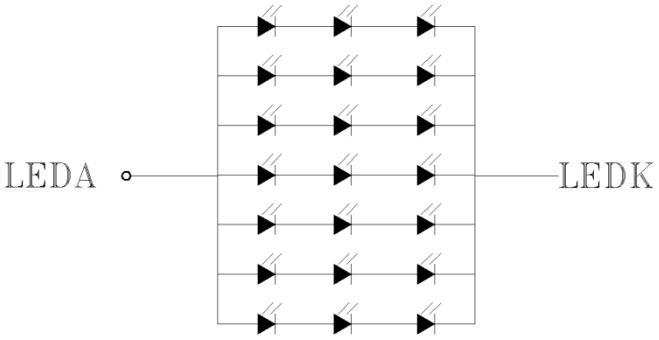
Reset time must be enough to guarantee reliable reset, The time of starting to report point after resetting approach to the time of starting to report point after powering on.




Reset Sequence

| | |
|---|---|
| Touch Controller: | FT5426 |
| Touch Panel Vendor ID: | Address: 0xA8 Data:0X03 |
| Firmware version number: | Address: 0xA6 Data:0x01 |

## 8. Backlight Characteristic



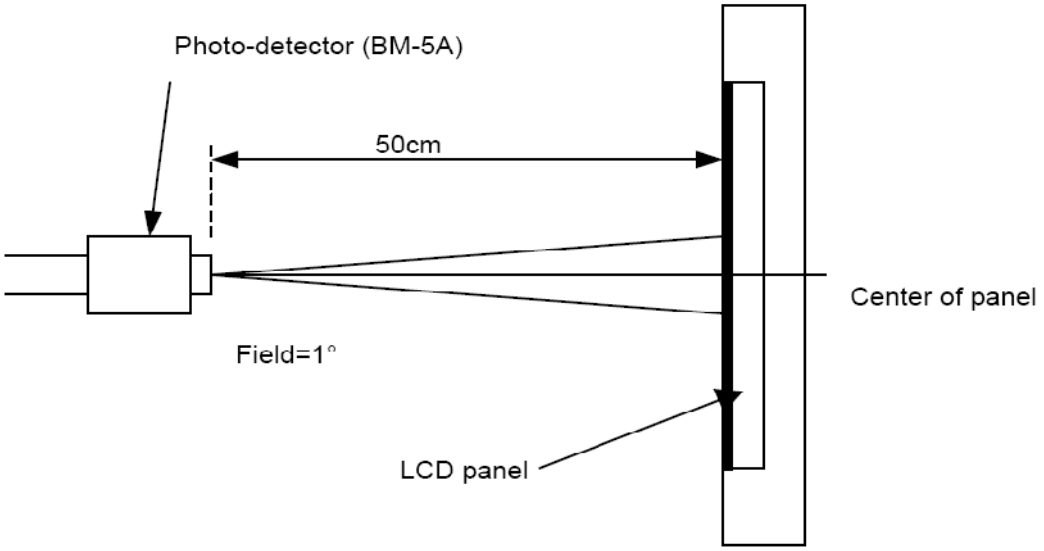

Backlight 21LED Circuit

| Item | Symbol | MIN | TYP | MAX | UNIT | Test Condition |
|---|---|---|---|---|---|---|
| Supply Voltage | Vf | 8.0 | 9.0 | 11.0 | V | If=140mA |
| Supply Current | If | - | 140 | - | mA | - |
| Luminous Intensity for LCM | - | 230 | 300 | - | $cd/m^2$ | If=140mA |
| Uniformity for LCM | - | 80 | - | - | % | If=140mA |
| Life Time | - | - | 50000 | - | Hr | If=140mA |
| Backlight Color | White | | | | | |

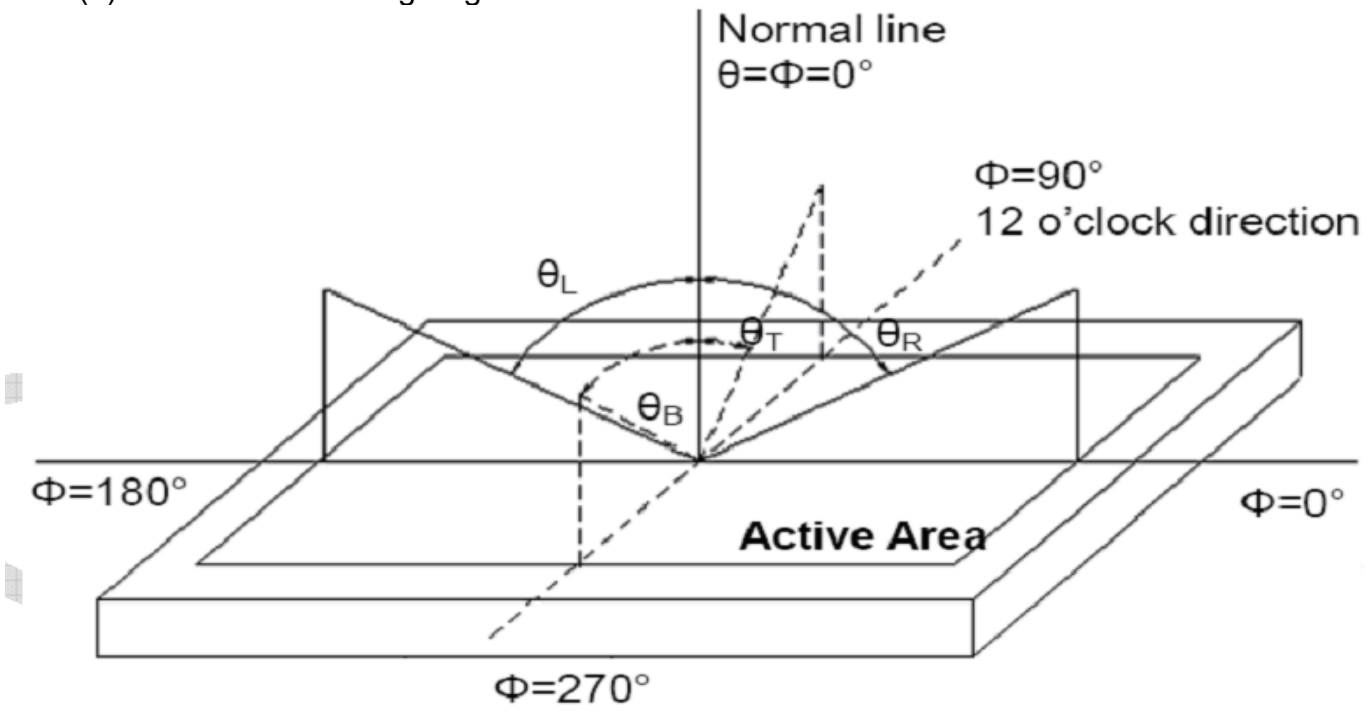
## 9. Optical Characteristics

| Item | Conditions | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|
| Viewing Angle (CR>10) | Vertical | 120 | 140 | - | degree | (1),(2),(6) |
| | Horizontal | 100 | 120 | - | | |
| Contrast Ratio | Center | 320 | 400 | - | - | (1),(3),(6) |
| Response Time | Tr + Tf | - | 25 | 40 | ms | (1),(4),(6) |
| CF Color Chromaticity (CIE1931) | Red x | Typ. -0.05 | TBD | Typ. +0.05 | - | (1), (6) |
| | Red y | | TBD | | - | |
| | Green x | | TBD | | - | |
| | Green y | | TBD | | - | |
| | Blue x | | TBD | | - | |
| | Blue y | | TBD | | - | |
| | White x | | TBD | | - | |
| | White y | | TBD | | - | |

Note (1) Measurement Setup: The LCD module should be stabilized at given temp. 25°C for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.



Note (2) Definition of Viewing Angle

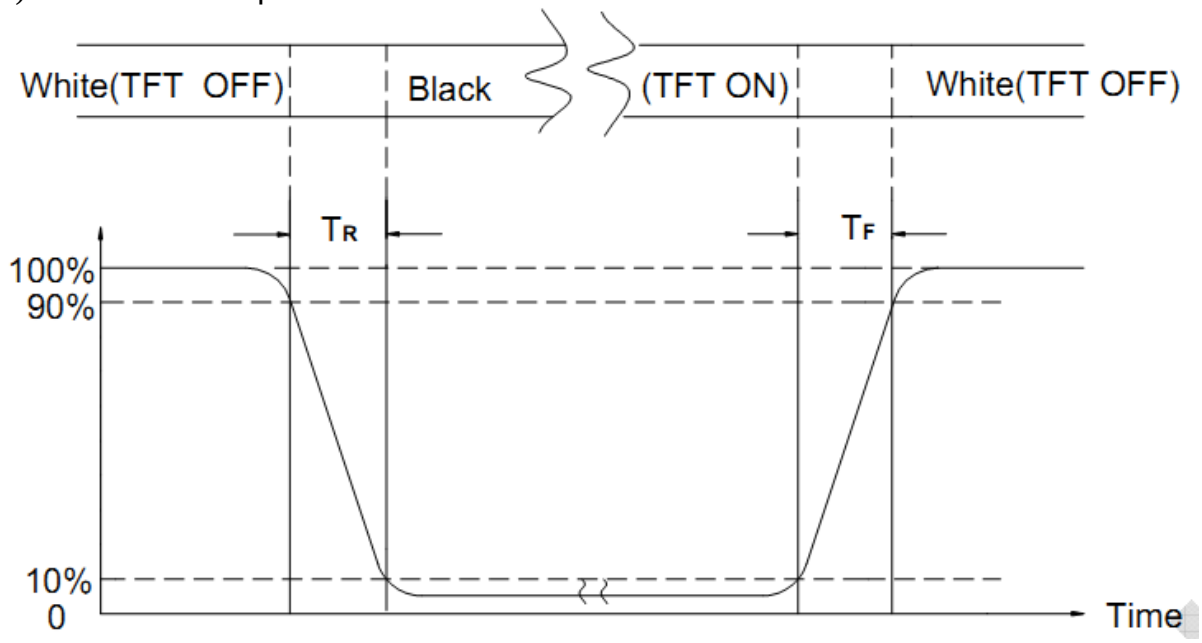



Note (3) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression
Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63, L0: Luminance of gray level 0

Note (4) Definition of response time




Note (5) Definition of Transmittance (Module is without signal input)

Transmittance = Center Luminance of LCD / Center Luminance of Back Light x 100%

Note (6) Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD

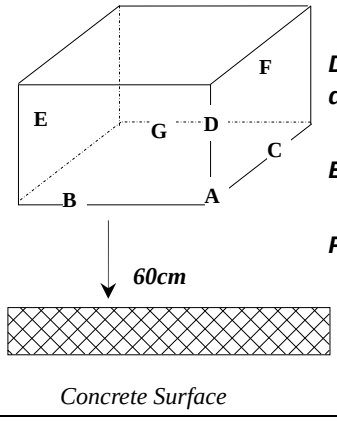
## 10. Reliability Test Conditions and Methods

No change on display and in operation under the following test condition.

Condition: Unless otherwise specified, tests will be conducted under the following condition.

Temperature: 20±5°C Humidity: 65±5%RH

Tests will be not conducted under functioning state.

| No. | Parameter | Condition | Notes |
|---|---|---|---|
| 1 | High Temperature Operating | 70°C±2°C, 240hrs (Operation state) | -- |
| 2 | Low Temperature Operating | -20°C±2°C, 240hrs (Operation state) | -- |
| 3 | High Temperature Storage | 80°C±2°C, 240hrs | -- |
| 4 | Low Temperature Storage | -30°C±2°C, 240hrs | -- |
| 5 | High Temperature and High Humidity Operation Test | 60°C±2°C, 90%, 240hrs | -- |
| 6 | Vibration Test | Total fixed amplitude: 1.5mm<br>Vibration Frequency: 10~55Hz<br>One cycle 60 seconds to 3 direction of X, Y, Z each 15 minutes. | -- |
| 7. | Drop Test | To be measured after dropping from 60cm high on the concrete surface in packing state.<br>  <br>***Dropping method corner dropping***<br>***A corner: once***<br>***Edge dropping***<br>***B, C, D edge: once***<br>***Face dropping***<br>***E, F, G face: once*** | -- |

Notes: 1. No dew condensation to be observed.

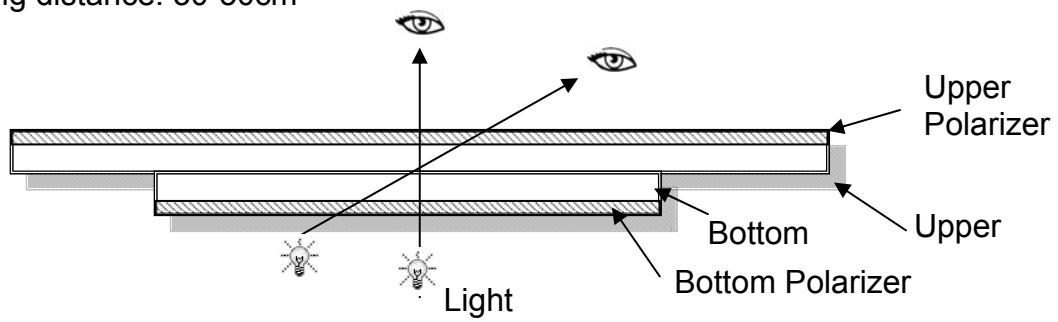
2. The function test shall be conducted after 4 hours storage at the normal temperature and humidity after removed from the test chamber.

3. Vibration test will be conducted to the product itself without putting I in a container.

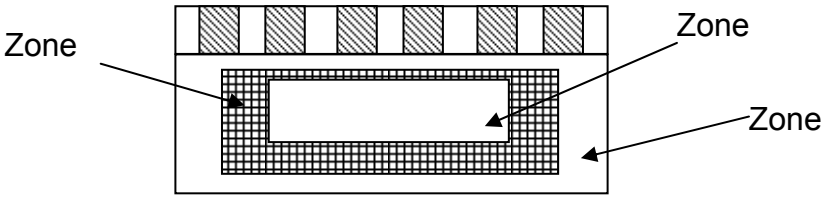
# 11. Inspection Standard

## 11.1.1 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




## 11.1.2 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 cannot 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.

## 11.1.3 Sampling Plan

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

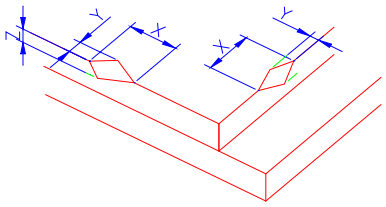
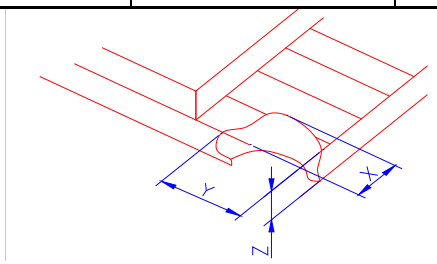
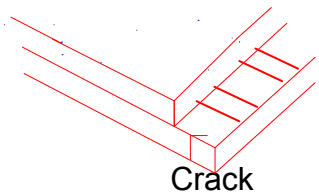
| Major defect | Minor defect |
|---|---|
| 0.65 | 1.5 |

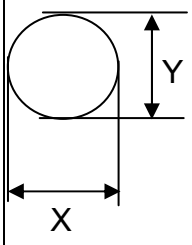
LCD: Liquid Crystal Display, TP: Touch Panel, LCM: Liquid Crystal Module

| 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. | |

### 11.1.4 Criteria (Visual)

<table>
<tr><th>Number</th><th>Items</th><th>Criteria(mm)</th></tr>
<tr><td rowspan="3">1.0<br>LCD Crack / Broken<br><br>NOTE:<br>X: Length<br>Y: Width<br>Z: Height<br>L: Length of ITO,<br>T: Height of LCD</td><td>(1) The edge of LCD broken</td><td>  <br><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>  <br><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><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">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.10</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.10<Φ≤0.15</td><td colspan="2">3( distance≧10mm)</td></tr>
<tr><td>0.15<Φ≤0.2</td><td colspan="2">1</td></tr>
<tr><td>0.2<Φ</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≤0.1</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.1<Φ≤0.2</td><td colspan="2">2( distance≧10mm)</td></tr>
<tr><td>0.2<Φ≤0.3</td><td colspan="2">1</td></tr>
<tr><td>Φ＞0.3</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≤0.2</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.2<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>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≤0.03</td><td>Ignore</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.03<W≤0.05</td><td>L≤3.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.05<W≤0.08</td><td>L≤2.0</td><td colspan="2">N≤2</td></tr>
<tr><td>0.08<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">2(distance≧10mm)</td></tr>
<tr><td>0.4<Φ≤0.6</td><td colspan="2">1</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>

# 12. Handling Precautions

## 12.1 Mounting method

The LCD panel of AMSON TFT module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

## 12.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent

[Recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Sulfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (Cl), Sulfur (S) from customer, Responsibility is on customer.

## 12.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to power or ground, do not input any signals before power is turned on, and ground your body, work/assembly areas, and assembly equipment to protect against static electricity.

## 12.4 packing

- Module employs LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

## 12.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- Slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

### 12.6 storing

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.
  [It is recommended to store them as they have been contained in the inner container at the time of delivery from us

### 12.7 Safety

- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.
- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water

## 13. Precaution for Use

### 13.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

### 13.2

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification.
- When a new problem is arisen which is not specified in this specifications?
- When an inspection specifications change or operating condition change in customer is reported to AMSON TFT and some problem is arisen in this specification due to the change.
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

## 14. Packing Method

**TBD**