# SPECIFICATION FOR CTP+LCD MODULE

**Part No.: TF190TM008V1**

**Customer No.:**

**Date: 2026-4-21**

| Supplier | | | Customer |
|---|---|---|---|
| Prepared | Checked | Approved | Approved |
| | | | |

# Record of Revision

| Rev. | Description | Page | Date |
|---|---|---|---|
| 0 | Preliminary specification released | / | 20260421 |
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## Table of Contents

# 1 General Specifications

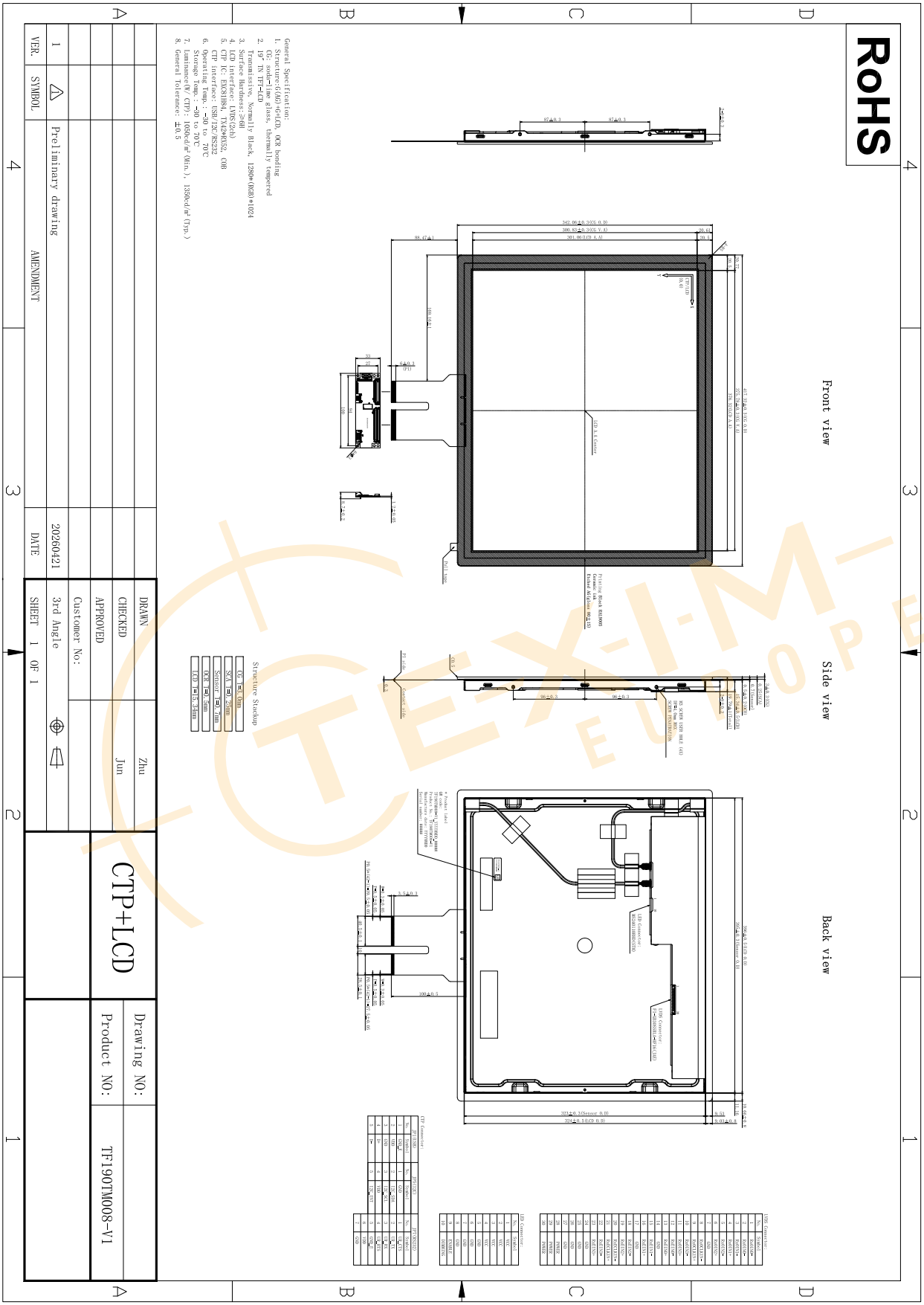
## 1.1 Definition

The specification is used for capacitive touch module with TFT LCD & Backlight Unit.

## 1.2 Features and General Description

| General | Specification | Unit | Note |
|---|---|---|---|
| Module Size | 19 | inch | diagonal |
| Structure | G+G+LCD, OCR Bonding | | |
| Resolution | 1280(RGB) × 1024 | | |
| Display Mode | Normally White. Transmissive | | |
| Pixel Pitch | 0.294(W) × 0.294(H) | mm | |
| Pixel Arrangement | RGB Vertical stripe | | |
| Viewing Direction | ALL | O'clock | |
| Outline Dimensions | 417.32(W) × 342.06(H) × 19.79(D) | mm | |
| Viewing Area | 375.78(W) × 300.83(H) | | |
| Active Area | 376.32(W) × 301.06(H) | mm | |
| LCD Interface | LVDS(2ch) | | |
| CTP Interface | USB / I2C / RS232 | | |
| CTP IC | EXC81H84 | | |
| Touch Point | 10 | | |
| Surface Hardness | 6 | H | |
| Surface Treatment | Etched AG(Gloss: 80±15) | | |

## 2 Mechanical Drawing



# 3 Pin assignment

## 3.1 LCD Pin assignment

LVDS connector: FI-XB30SSRLA-HF16-R3500 (JAE)

| Pin | Symbol | Description | Note |
|---|---|---|---|
| 1 | RxOIN0- | Negative LVDS differential data input (Odd data) | |
| 2 | RxOIN0+ | Positive LVDS differential data input (Odd data) | |
| 3 | RxOIN1- | Negative LVDS differential data input (Odd data) | |
| 4 | RxOIN1+ | Positive LVDS differential data input (Odd data) | |
| 5 | RxOIN2- | Negative LVDS differential data input (Odd data) | |
| 6 | RxOIN2+ | Positive LVDS differential data input (Odd data) | |
| 7 | GND | Ground | |
| 8 | RxOCLKIN- | Negative LVDS differential clock input (Odd clock) | |
| 9 | RxOCLKIN+ | Positive LVDS differential clock input (Odd clock) | |
| 10 | RxOIN3- | Negative LVDS differential data input (Odd data) | |
| 11 | RxOIN3+ | Positive LVDS differential data input (Odd data) | |
| 12 | RxEIN0- | Negative LVDS differential data input (Even data) | |
| 13 | RxEIN0+ | Positive LVDS differential data input (Even data) | |
| 14 | GND | Ground | |
| 15 | RxEIN1- | Negative LVDS differential data input (Even data) | |
| 16 | RxEIN1+ | Positive LVDS differential data input (Even data) | |
| 17 | GND | Ground | |
| 18 | RxEIN2- | Negative LVDS differential data input (Even data) | |
| 19 | RxEIN2+ | Positive LVDS differential data input (Even data) | |
| 20 | RxECLKIN- | Negative LVDS differential clock input (Even clock) | |
| 21 | RxECLKIN+ | Positive LVDS differential clock input (Even clock) | |
| 22 | RxEIN3- | Negative LVDS differential data input (Even data) | |
| 23 | RxEIN3+ | Positive LVDS differential data input (Even data) | |
| 24 | GND | Ground | |
| 25 | NC | No connection | |
| 26 | NC | No connection | |
| 27 | NC | No connection | |
| 28 | POWER | LCD Power Supply: +5V | |
| 29 | POWER | LCD Power Supply: +5V | |
| 30 | POWER | LCD Power Supply: +5V | |

LED connector: MS240110RHD (STM)

| Pin | Symbol | Description |
|---|---|---|
| 1 | VCC | Supply Voltage 12V |
| 2 | VCC | Supply Voltage 12V |
| 3 | VCC | Supply Voltage 12V |
| 4 | VCC | Supply Voltage 12V |
| 5 | GND | Ground |
| 6 | GND | Ground |
| 7 | GND | Ground |
| 8 | GND | Ground |
| 9 | Enable | 3.3V-On / 0V-Off |
| 10 | Dimming | PWM Dimming |

### 3.2 CTP Pin assignment

USB connector: JP1

| Pin | Symbol | Description |
|---|---|---|
| 1 | GND_E | Ground |
| 2 | VDD | CTP Power Supply : 5V |
| 3 | GND | Ground |
| 4 | D+ | CTP USB data port plus |
| 5 | D- | CTP USB data port minus |

I2C connector: JP5

| Pin | Symbol | Description |
|---|---|---|
| 1 | GND | Ground |
| 2 | I2C_SDA | CTP I2C SDA signal |
| 3 | I2C_SCL | CTP I2C SCL signal |
| 4 | VDD | CTP Power Supply : 5V |
| 5 | I2C_INT | CTP I2C INT signal |

RS232 connector: JP5

| Pin | Symbol | Description |
|---|---|---|
| 1 | UR_CTS | CTP RS232 CTS signal |
| 2 | UR_TX | CTP RS232 TX signal |
| 3 | UR_RX | CTP RS232 RX signal |
| 4 | UR_RTS | CTP RS232 RTS signal |
| 5 | GND_E | Ground |
| 6 | VDD | CTP Power Supply : 5V |
| 7 | GND | Ground |

# 4 Absolute Maximum Rating

## 4.1 Absolute Ratings of TFT LCD Module

| Item | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Logic/LCD drive Voltage | Vin | -0.3 | +6.0 | [Volt] |

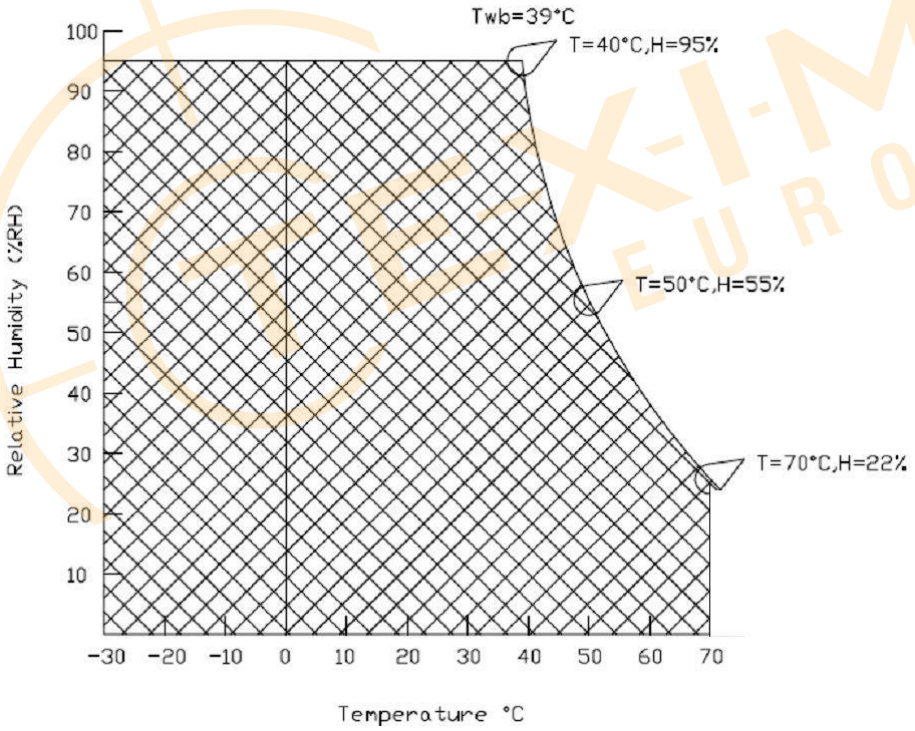
Note: With in Ta (25 °C)

## 4.2 Absolute Ratings of Environment

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table

| Item | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Operating Temperature | TOP | -30 | +70 | [°C] |
| Operation Humidity | HOP | 5 | 95 | [%RH] |
| Storage Temperature | TST | -30 | +70 | [°C] |
| Storage Humidity | HST | 5 | 95 | [%RH] |

Note: Maximum Wet-Bulb should be 39 °C and no condensation.



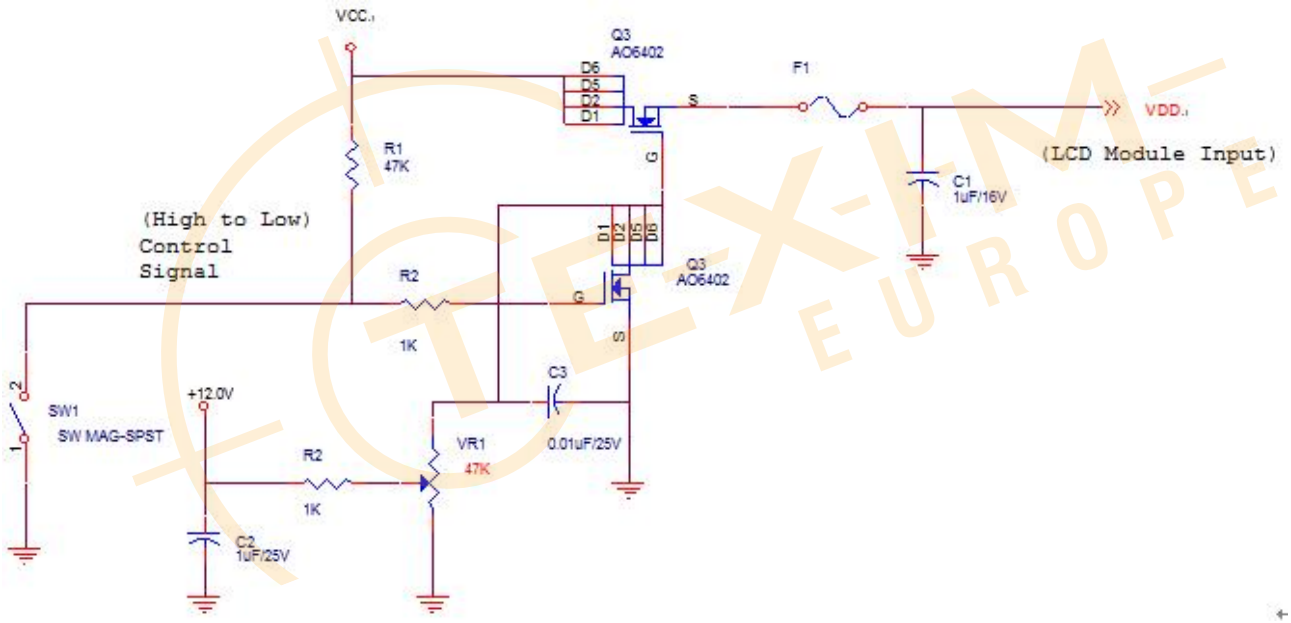
# 5 Electrical Characteristic

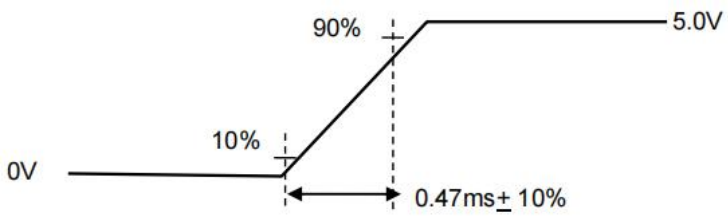
## 5.1 LCD Power Specifications

Input power specifications are shown as follows ;

| Symbol | Parameter | Min | Typ | Max | Units | Remark |
|---|---|---|---|---|---|---|
| VDD | Logic/LCD Drive Voltage | 4.5 | 5.0 | 5.5 | [Volt] | +/-10% |
| IDD | Input Current | - | 0.6 | 0.8 | [A] | VDD= 5.0V, All Black Pattern At 75Hz |
| PDD | VDD Power | - | 3 | 4 | [Watt] | VDD= 5.0V, All Black Pattern At 75Hz |
| IRush | Inrush Current | - | - | 3.0 | [A] | Note 1 |
| VDDrp | Allowable Logic/LCD Drive Ripple Voltage | - | - | 100 | [mV] p-p | VDD= 5.0V, All Black Pattern At 75Hz |

Note 1: Measurement condition



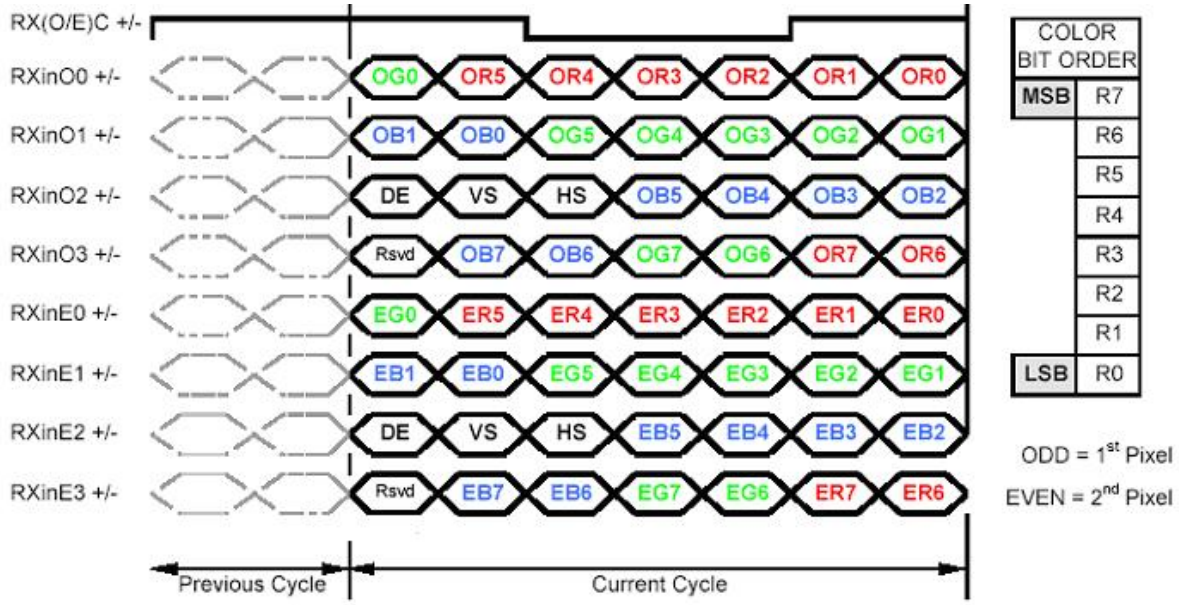

**VDD rising time**

## 5.2 Backlight input signal characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|
| Vcc | Input Voltage | 10.8 | 12 | 13.2 | Volt | |
| Ivcc | Input Curent | - | 2.60 | - | A | VCC=12V, Ta=25℃ at 100% |
| PLED | Power Consumption | - | 34 | 39 | Watt | VCC=12V, Ta=25℃ at 100% |
| Inrush | Inrush Current | - | - | TBD | A | |
| VLED on/off | On Control Voltage | 2 | 3.3 | 5 | Volt | Back light on/off |
| | Off Control Voltage | 0 | - | 0.6 | Volt | |
| EPWM | PWM Dimming Frequency | 200 | - | 20K | Hz | |
| | High Voltage | 2 | 3.3 | 5 | Volt | |
| | Low Voltage | 0 | - | 0.6 | Volt | |
| | Dimming Duty 200~5K | 5 | | 100 | % | |
| | Dimming Duty 5K~20K | 15 | | 100 | % | |
| $I_F$ | LED Forward Current | - | 75 | | mA | Ta = 25°C (per string) |

| | | | | | | |
|---|---|---|---|---|---|---|
| LTLED | LED Life-Time | 50000 | - | - | Hour | Ta = 25°C |

## 5.3 Input Data Format




Note1: Normally, DE, VS, HS on EVEN channel are not used.
Note2: Please follow PSWG.
Note3: 8-bit in

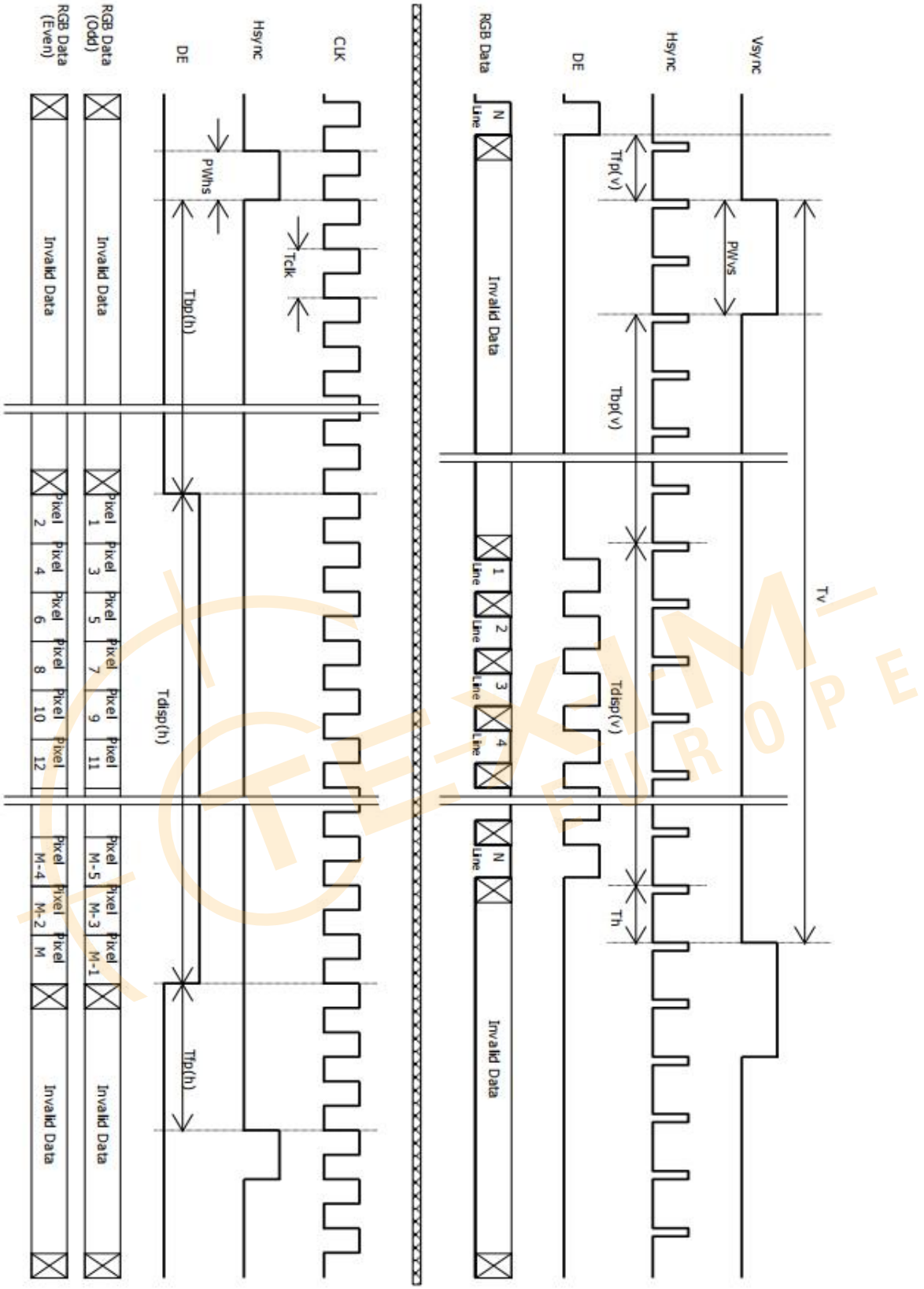
## 5.4 Interface Timing

### 5.4.1 Timing Characteristics

| Signal | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Clock | Period | Tclk | 22.2 | 18.52 | 14.81 | ns |
| | Frequency | Freq. | 44 | 54 | 67.5 | MHz |
| Vertical Section | Period | $T_V$ | 1032 | 1066 | 1150 | $T_{Line}$ |
| | Active | $T_{VD}$ | 1024 | 1024 | 1024 | |
| | Blanking | $T_{VB}$ | 8 | 42 | 126 | |
| Horizontal Section | Period | $T_H$ | 780 | 844 | 2047 | $T_{Clock}$ |
| | Active | $T_{HD}$ | 640 | 640 | 640 | |
| | Blanking | $T_{HB}$ | 140 | 204 | - | |
| Frame Rate | | F | 49 | 60 | 75 | Hz |

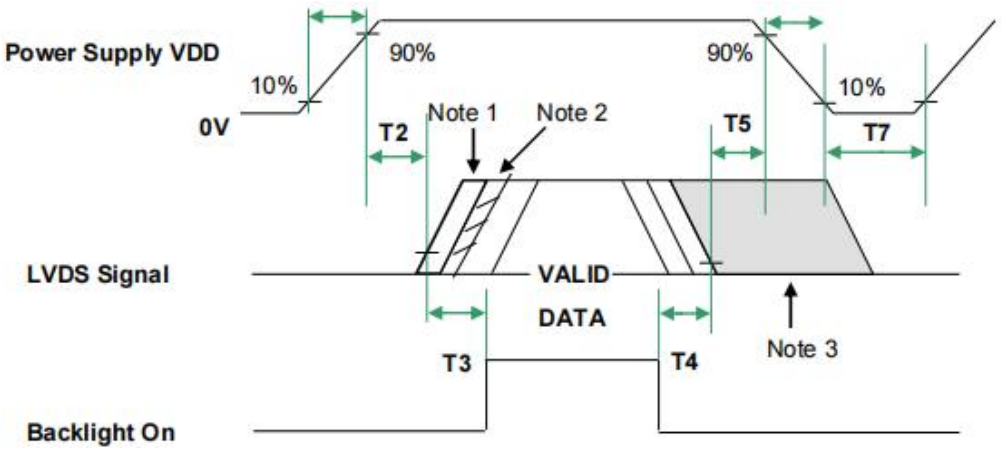
Note : DE mode only.

5.4.2 Input Timing Diagram



### 5.4.3 Power ON/OFF Sequence

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




Note1: insert a white pattern 360ms
Note2: insert a black pattern
Note3: insert a white pattern after valid data and last until VDD falls to 10%.
Note4: when AC on/off, timing rule of logo power on/off is the same as above.

**Power ON/OFF sequence timing**

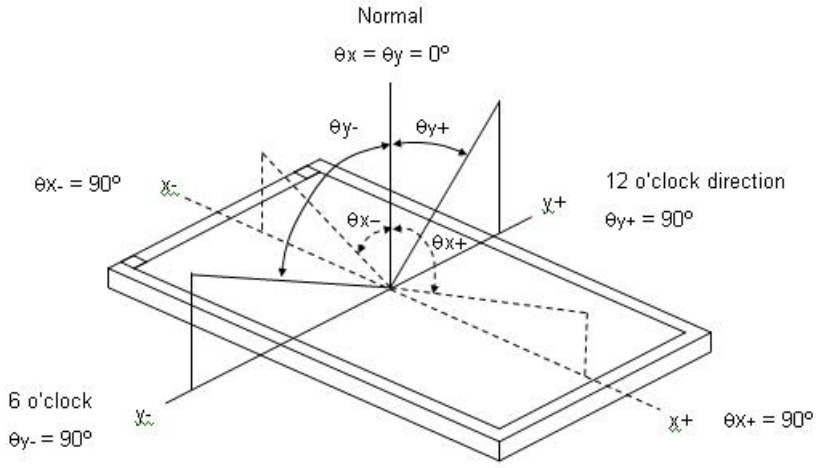
| Parameter | Value | | | Units |
|---|---|---|---|---|
| | Min. | Typ. | Max. | |
| T1 | 0.5 | - | 10 | [ms] |
| T2 | 0 | 40 | 50 | [ms] |
| T3 | 500 | - | - | [ms] |
| T4 | 300 | - | - | [ms] |
| T5 | 40 | 1500 | - | [ms] |
| T6 | - | - | - | [ms] |
| T7 | 1000 | - | - | [ms] |

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

## 6 Optical Characteristics

| Item | | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| Viewing Angle | Horizontal | $\theta_X$+ | CR≧10 | 75 | 85 | - | Deg. | (1), (5) |
| | | $\theta_X$- | | 75 | 85 | - | Deg. | |
| | Vertical | $\theta_Y$+ | | 75 | 80 | - | Deg. | |
| | | $\theta_Y$- | | 75 | 80 | - | Deg. | |
| Luminance (W/ CTP) | | Lv | $\theta_X$=0°, $\theta_Y$=0° | 1050 | 1350 | - | nit | (4), (5) |
| Uniformity | 9 points | ΔY9 | | 75 | 80 | - | % | (5), (6) |
| Contrast ratio | | CR | | 600 | 1000 | - | | (2), (5) |
| Color Chromaticity (CIE 1931) | White | $W_x$ | $\theta_X$=0°, $\theta_Y$=0° R=G=B=255 Gray scale | Typ-0.05 | 0.310 | Typ+0.05 | - | (1), (5) |
| | | $W_y$ | | | 0.320 | | - | |
| | Red | $R_x$ | | | - | | - | |
| | | $R_y$ | | | - | | - | |
| | Green | $G_x$ | | | - | | - | |
| | | $G_y$ | | | - | | - | |
| | Blue | $B_x$ | | | - | | - | |
| | | $B_y$ | | | - | | - | |
| Response Time | $T_R$+$T_F$ | | | - | 10 | 20 | ms | (3) |

Note (1) Definition of Viewing Angle ($\theta_X$, $\theta_Y$):




Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

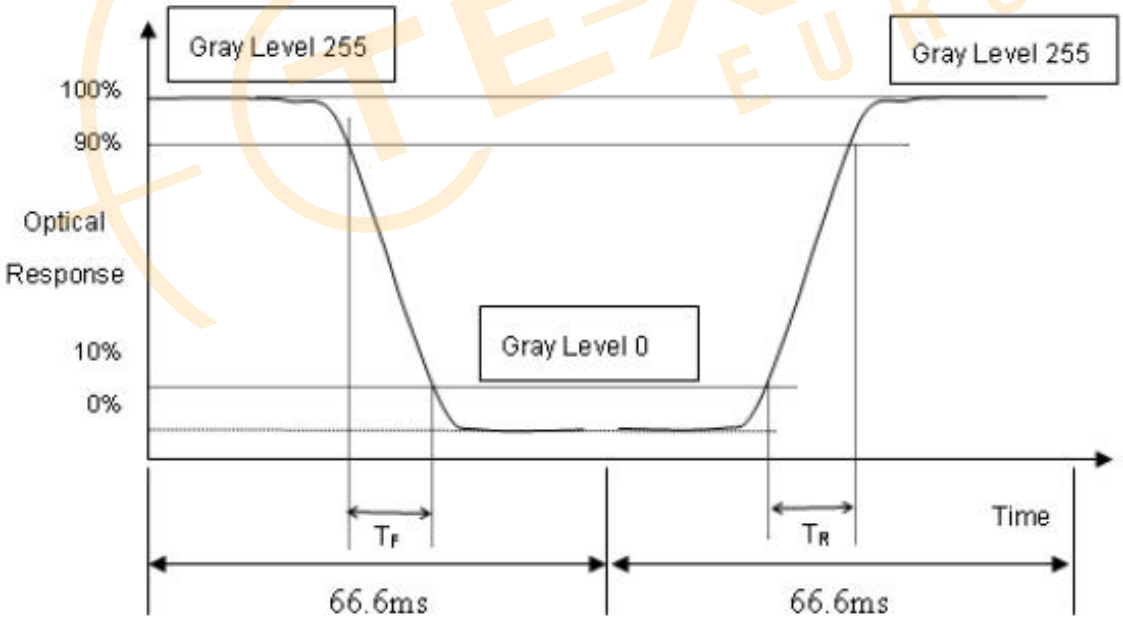
L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

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



Note (4) Definition of Luminance of White (LC):

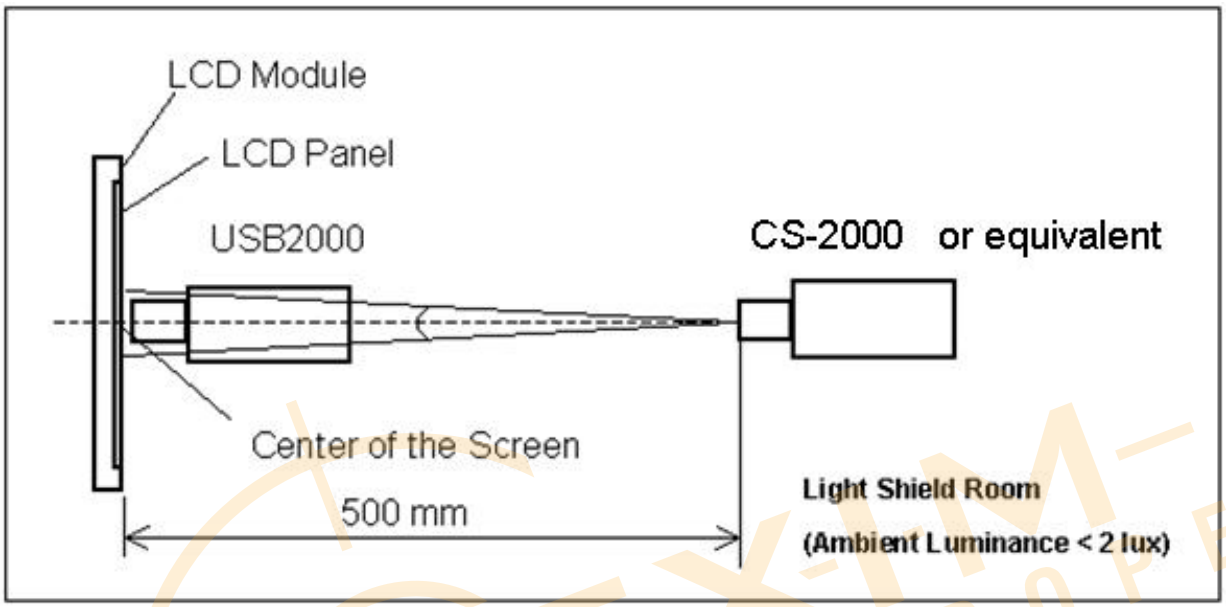
Measure the luminance of gray level 255 at center point

LC = L (5)

L (x) is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Setup:

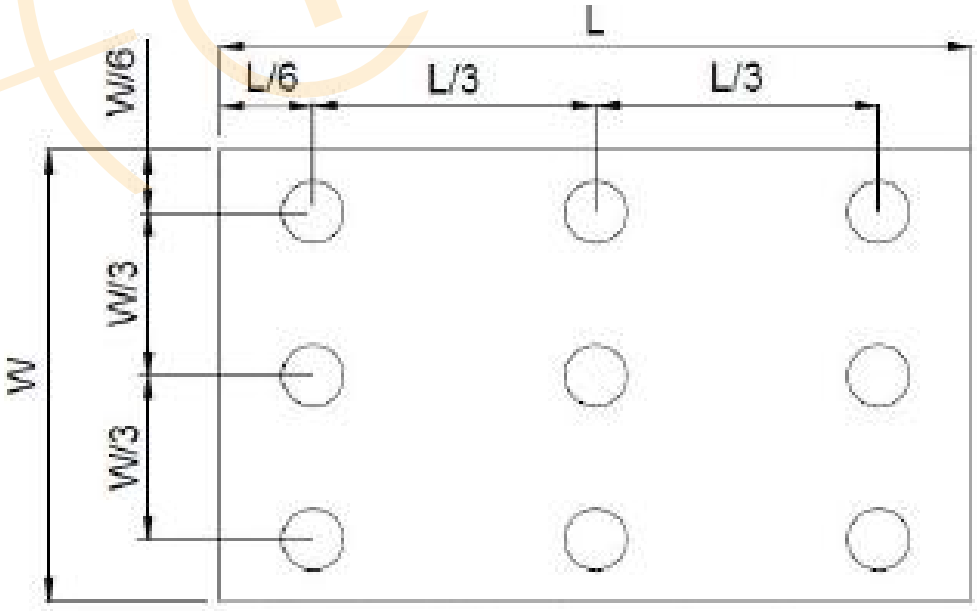
The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.




Note (6) Definition of White Variation ( δ W):

Measure the luminance of gray level 255 at 9 points

δ W = ( Minimum [L (1) ~ L (9)] / Maximum [L (1) ~ L (9)] ) *100%



## 7 Reliability Test

| Test Item | Condition |
|---|---|
| High Temperature Storage Test | 70℃, 240 hrs |
| Low Temperature Storage Test | -30℃, 240 hrs |
| High Temperature Operation Test | 70℃, 240 hrs |
| Low Temperature Operation Test | -30℃, 240 hrs |
| High temperature & high humidity operation Test | 50℃, 80%RH, 240 hrs |
| Thermal Shock Test (TST) | -20℃/30min, 60℃/30min, 50 cycles |
| Electro-static discharge test (non-operating) | Contact Discharge: ± 8KV, 150pF(330Ω ) 1sec, 9 points, 25 times/ point.<br>Air Discharge: ± 15KV, 150pF(330Ω ) 1sec, 9 points, 25 times/ point. |

Note :

(1) There should be no condensation on the surface of panel during test.

(2) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.

(3) In the standard conditions, there is no function failure issue occurred. All the cosmetic specification is judged before reliability test.

(4) Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

# 8 Appearance Inspection

## 8.1 Inspection Sampling Method:

Unless there is other agreement, the sampling plan for incoming inspection shall follow GB2828.1-2012.

(1) Lot size: Quantity per shipment as one lot (different model as different lot).
(2) Sampling type: Normal inspection, single sampling.
(3) Sampling level: Level II.

## 8.2 Inspection Conditions

The environmental condition and visual inspection shall be conducted as below:
(1) Light: 800~1400Lux;
(2) Vision requirement: Naked or corrected vision of at least 1.0 and no color blindness;
(3) Inspection background: black and white board is used as the background below the product;
(4) Inspection distance: 30~40cm from human eyes to the measured surface;
(5) Inspection Angle: the detected surface is 90 degree from to line of sight, and the measured Object should be rotated 45 degree from side to side;
(6) Inspection time: 5~10s;

## 8.3 Inspection equipment

Secondary elements, calipers, feelers, filinka, petroleum ether, ND filter

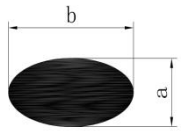
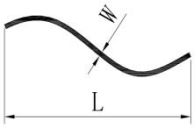
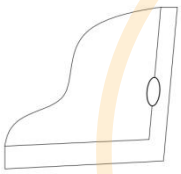
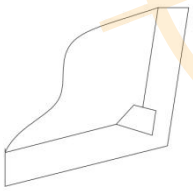
## 8.4 Defect code comparison table

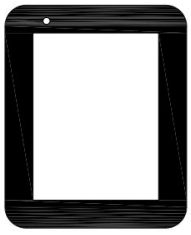
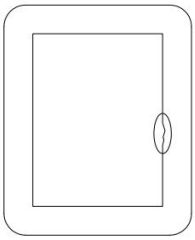
| Code | Name (Unit) | Code | Name (Unit) |
|---|---|---|---|
| N | Number | D | Diameter (mm) |
| L | Length (mm) | H | Depth (mm) |
| W | Width (mm) | S | Distance (mm) |
| S | Area ($mm^2$) | | |

## 8.5 Inspection precautions

(1) Inspectors must wear finger gloves and electrostatic bracelets.
(2) Place the inspected product in front of the inspector, and hold the edge of the product with both hands carefully. Do not bend the product.

## 8.6 Inspection items and standards

| Items | Standard | Conclusion | Inspection tools |
|---|---|---|---|
| Dot (white, black, heterochromatic )<br>  <br><br>D=(a+b)/2 | D≤0.3 | Ignore, dense density is not allowed | Visual inspection |
| | 0.3＜D≤0.8 | The distance with another dot is more than 10 mm,<br>Transparent areas : N≤5, Ink areas : N≤6 | |
| | D＞0.8 | Not allow | |
| Linear defects (fibers/foreign bodies/ scratches, etc.)<br>  <br> | W≤0.08 | Ignore, dense density is not allowed | Visual inspection |
| | 0.08＜W≤0.2 | L≤15, the distance with another scratch or impurity is more than 5mm<br>Transparent areas : N≤5, Ink areas : N≤5 | |
| | W＞0.2, L＞15 | Not allow | |
| Bubble | According to the point standard | | Visual inspection |
| Edge broken loss<br>  <br>Corner broken loss<br>  | 1. The sensor edge creaks, without damaging the line. The function test is OK for reception, and the front side is not visible after fitting.<br>2. Edge creak on front of cover plate: NG.<br>3. Back X＜0.5mm; Y＜0.5mm; Z＜1/3GT(GT= glass thickness), without affecting the functionality of the product, each side is allowed three | | Visual inspection |

| Items | Standard | Conclusion | Inspection tools |
|---|---|---|---|
| Creak | Creaks found at any location are not allowed | | Visual inspection |
| Size | Meet the requirements of finished product inspection drawings | | |
| Ink pinhole  | D≤0.2 | Ignore, dense density is not allowed | |
| | 0.2＜D≤0.3 | N≤6<br>DS≥10mm, Repair with a paint pen of the same color as the cover plate | |
| Ink sawtooth  | W≤0.2mm | Ignore, dense density is not allowed | |
| Newton's rings | No more than 1/6 of the display area, light up invisible. If there are special requirements, the limited sample shall prevail. | | |
| FPC  | 1. Oxidation, breakage, residual glue, coating peeling, cracking and other phenomena of FPC gold fingers are not allowed.<br>2. Less components, false welding, deformation are not allowed. | | |
| Color | Consistent with the sample, no serious color difference | | |
| Mura/Waving/ Hot spot | Not visible through 5% ND filter | | |

# 9 Notices

## 9.1 Cautions for storage

Store the module in a dark room where must keep at 25±10℃ and 65%RH or less. Don't expose the products to the direct sunlight or stresses.

## 9.2 Cautions for operation

(1) Do not put a heavy, hard or sharp object on the product.
(2) Do not bend the product in order to assure the reliability.
(3) Do not put one product on the other. Otherwise, the product to may be scratched or be changed.
(4) Do not oile the touch panel, Do not put heavy goods on the touch panel.
(5) Do not use any organic solvent acid or alkali solution to clean the surface of the product. Please use dry clothes or soft clothes with ethanol to clean the surface.

## 9.3 Cautions for operation

Light transmission is an important factor for the product. So, please wear clean finger sacks, gloves and mask to protect the products from fingerprint or stain attach, and also must ensure the area where your finger touches is outside the view area when handing the panel.

## 9.4 Others

(1) Please note that dew gathering in the panel due to abrupt temperature or humidity change, etc. Which may cause deterioration of performance.
(2) When this product was built into the package, if there is vulcanization material such as vulcanized rubber which has a possibility of generating the salutation gas near the package since abnormalities will be caused to wring of the product and it will become the cause if functional degradation, please give a constitutional cations.
(3) Cation for product safety set

Although full care is taken to ensure product quality, failure modes such as degradation, short circuits, or open circuits might be caused, Therefore, to design a product set, please study the effects of any single failure of the panel in advance and consider the safety of product configuration.

Quality function livers for on year, outward appearance haves non-color variation in six months.

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