



# **TFT LCD Module Product Specification**

## **DT070DTFT-IPS-HB-PTS 7.0" (1024RGB x 600 DOTS) IPS TFT Module With Capacitive Touch Screen**

November 1, 2019

**Remark:**

Contents in this document are subject to change without notice. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Displaytech.

**Displaytech**

Email: [sales@displaytech.com.hk](mailto:sales@displaytech.com.hk)

Website: <http://www.displaytech.com.hk>

**Revision Record**

| <b>REV</b>                  | <b>CHANGES</b> | <b>DATE</b> |
|-----------------------------|----------------|-------------|
| A<br>(Ref. 1.1<br>20191023) | First release  | Nov 1, 2019 |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |
|                             |                |             |

## Table of Content

|   |           |
|---|-----------|
| <b>Revision Record .....</b>                        | <b>1</b>  |
| <b>1. Scope .....</b>                               | <b>4</b>  |
| <b>2. Application .....</b>                         | <b>4</b>  |
| <b>3. General Information.....</b>                  | <b>4</b>  |
| <b>4. Outline Drawing .....</b>                     | <b>5</b>  |
| <b>5. Interface signals .....</b>                   | <b>6</b>  |
| <b>6. Absolute maximum Ratings .....</b>            | <b>7</b>  |
| 6.1. Electrical Absolute max. ratings .....         | 7         |
| 6.2. Environment Conditions .....                   | 7         |
| <b>7. Electrical Specifications .....</b>           | <b>8</b>  |
| 7.1 Electrical characteristics .....                | 8         |
| 7.2 LED Backlight.....                              | 8         |
| <b>8. Command/AC Timing .....</b>                   | <b>9</b>  |
| 8.1 TTL mode AC electrical Characteristics .....    | 9         |
| 8.2 LVDS mode AC electrical characteristics .....   | 9         |
| 8.3. Data input format .....                        | 11        |
| 8.4. LVDS mode data input format .....              | 11        |
| 8.5. Timing diagram .....                           | 12        |
| 8.6. Power ON/OFF Sequence.....                     | 12        |
| <b>9. Optical Specification .....</b>               | <b>14</b> |
| <b>10. Environmental / Reliability Tests .....</b>  | <b>17</b> |
| <b>11. Precautions for Use of LCD Modules .....</b> | <b>18</b> |
| 11.1 Safety .....                                   | 18        |
| 11.2 Handling.....                                  | 18        |
| 11.3 Static Electricity .....                       | 18        |
| 11.4 Storage.....                                   | 18        |

**11.5 Cleaning..... 18**

**11.6 Cautions for installing and assembling..... 18**

## 1. Scope

This data sheet is to introduce the specification of DT070DTFT-IPS-HB-PTS, active matrix IPS TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC, CTP and a backlight unit. The 7.0" display area contains 1024(RGB) x 600 pixels.

As to basic specification of the driver IC, refer to the IC specification and datasheet.

## 2. Application

Digital equipments which need color display, mobile navigator/video systems.

## 3. General Information

| Item                          | Contents               | Unit |
|-------------------------------|------------------------|------|
| Size                          | 7.0                    | inch |
| Resolution                    | 1024(RGB)*600          | /    |
| Interface                     | LVDS                   | /    |
| Technology type               | IPS                    | /    |
| Pixel Configuration           | R.G.B Stripe           |      |
| Outline Dimension (W x H x D) | 164.90 x 100.00 x 7.40 | mm   |
| Active Area                   | 154.21 x 85.92         | mm   |
| Backlight Type                | LED                    | /    |
| Display Controller /driver    | HX8282A11/HX8696A 01   | /    |
| Touch driver IC               | FT5426                 | /    |
| Viewing Direction             | ALL                    | /    |
| Weight                        | TBD                    | g    |



## 5. Interface signals

| Pin No. | Symbol    | Description   | Remark |
|---------|-----------|---|--------|
| 1       | VCOM      | Common voltage  |        |
| 2       | VDD       | Power supply  |        |
| 3       | VDD       | Power supply  |        |
| 4       | NC        | No connection   |        |
| 5       | RESET     | Global reset pin, Active low                                |        |
| 6       | STBYB     | Standby mode, Active low                                    |        |
| 7       | GND       | Power Ground  |        |
| 8       | RXIN0-    | Differential Data Input ,CH0 (Negative)                     |        |
| 9       | RXIN0+    | Differential Data Input ,CH0 (Positive)                     |        |
| 10      | GND       | Power Ground  |        |
| 11      | RXIN1-    | Differential Data Input ,CH1 (Negative)                     |        |
| 12      | RXIN1+    | Differential Data Input ,CH1 (Positive)                     |        |
| 13      | GND       | Power Ground  |        |
| 14      | RXIN2-    | Differential Data Input ,CH2 (Negative)                     |        |
| 15      | RXIN2+    | Differential Data Input ,CH2 (Positive)                     |        |
| 16      | GND       | Power Ground  |        |
| 17      | RXCLKIN-  | Differential Clock Input (Negative)                         |        |
| 18      | RXCLKIN+  | Differential Clock Input (Positive)                         |        |
| 19      | GND       | Power Ground  |        |
| 20      | RXIN3-    | Differential Data Input ,CH3 (Negative)                     |        |
| 21      | RXIN3+    | Differential Data Input ,CH3 (Positive)                     |        |
| 22      | GND       | Power Ground  |        |
| 23      | NC        | No connection   |        |
| 24      | NC        | No connection   |        |
| 25      | GND       | Power Ground  |        |
| 26      | NC        | No connection   |        |
| 27      | NC        | No connection   |        |
| 28      | SELB(HSD) | LVDS Mode Input Select.<br>HSD="L": 8-bit<br>HSD="H": 6-bit |        |
| 29      | AVDD      | Power supply for analog circuits                            |        |
| 30      | GND       | Power Ground  |        |
| 31      | LED-      | Power for LED backlight (Cathode)                           |        |
| 32      | LED-      | Power for LED backlight (Cathode)                           |        |
| 33      | L/R       | Source Right or Left sequence control.                      | Note   |
| 34      | U/D       | Gate Up or Down scan control.                               | Note   |
| 35      | VGL       | Gate OFF Voltage  |        |
| 36      | NC        | No connection   |        |
| 37      | NC        | No connection   |        |
| 38      | VGH       | Gate ON Voltage   |        |
| 39      | LED+      | Power for LED backlight (Anode)                             |        |
| 40      | LED+      | Power for LED backlight (Anode)                             |        |

Note:

| U/D | L/R | FUNCTION                                   |
|-----|-----|--|
| 0   | 1   | Normal Display                             |
| 0   | 0   | Inverse Left and Right                     |
| 1   | 1   | Inverse Up and Down                        |
| 1   | 0   | Inverse Left and Right Inverse Up and Down |

TP Interface signals:

| No. | Symbol | Description                   | Remark |
|-----|--------|-------------------------------|--------|
| 1   | SCL    | I <sup>2</sup> C clock signal |        |
| 2   | SDA    | I <sup>2</sup> C data signal  |        |
| 3   | VDD    | Power supply for CTP          |        |
| 4   | RESET  | Reset pin                     |        |
| 5   | INT    | Interrupt output pin          |        |
| 6   | GND    | Power ground                  |        |

## 6. Absolute maximum Ratings

### 6.1. Electrical Absolute max. ratings

| Parameter                          | Symbol              | MIN  | MAX     | Unit | Remark |
|------------------------------------|---------------------|------|---------|------|--------|
| Power Supply Voltage               | VDD                 | -0.3 | 5.0     | V    |        |
|                                    | AVDD                | -0.5 | 15.0    | V    |        |
|                                    | VGH                 | -0.3 | 40.0    | V    |        |
|                                    | VGL                 | -20  | 0.3     | V    |        |
| Logic Signal Input /output Voltage | V <sub>I/OVCC</sub> | -0.3 | VDD+0.5 | V    |        |
| Current of LED                     | I <sub>LED</sub>    | 0    | 200     | mA   |        |

Note1: If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

Note2: Please be sure users are grounded when handing LCD Module.

### 6.2. Environment Conditions

| Item                  | Symbol | MIN | MAX | Unit | Remark |
|-----------------------|--------|-----|-----|------|--------|
| Operating Temperature | TOPR   | -20 | 70  | °C   |        |
| Storage Temperature   | TSTG   | -30 | 80  | °C   |        |



Note1: The response time will become lower when operated at low temperature.

Note2: Background color changes slightly depending on ambient temperature.  
The phenomenon is reversible.

Note3: Ta<=40°C:85%RH MAX.

Ta>=40°C:Absolute humidity must be lower than the humidity of 85%RH at 40°C.

## 7. Electrical Specifications

### 7.1 Electrical characteristics

GND=0V, Ta=25°C

| Item                | Symbol            | MIN             | TYP    | MAX  | Unit   | Remark   |
|---------------------|-------------------|-----------------|--------|------|--------|----------|
| Power Supply        | VDD               | 2.6             | 3.3    | 3.6  | V      |          |
|                     | VCOM              | 2.85            | 3.0    | 3.45 | V      |          |
|                     | AVDD              | 9.4             | 9.6    | 9.8  | V      |          |
|                     | VGH               | 17              | 18     | 19   | V      |          |
|                     | VGL               | -6.6            | -6.0   | -5.4 | V      |          |
| Input Voltage       | H                 | V <sub>IH</sub> | 0.8VDD | -    | VDD    | VDD=2.8V |
|                     | L                 | V <sub>IL</sub> | 0      | -    | 0.2VDD |          |
| Current Consumption | I <sub>VDD</sub>  | -               | 30     | 45   | mA     |          |
|                     | I <sub>AVDD</sub> | -               | 35     | 45   | mA     |          |

### 7.2 LED Backlight

Ta=25°C

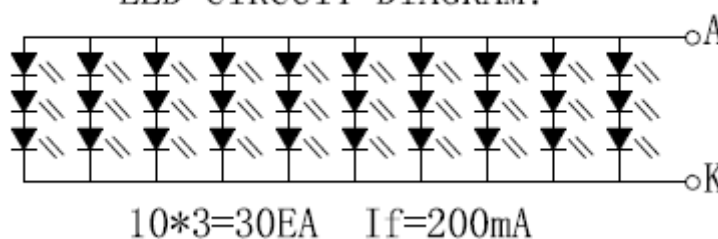
| Item            | Symbol         | MIN | TYP   | MAX | Unit | Remark |
|-----------------|----------------|-----|-------|-----|------|--------|
| Forward Current | I <sub>L</sub> | -   | 200   | -   | mA   |        |
| Forward Voltage | V <sub>L</sub> | -   | 9.6   | -   | V    | Note1  |
| LED life time   | -              | -   | 25000 | -   | Hr   | Note2  |

Note1: The LED Supply Voltage is defined by the number of LED at Ta=25°C and I<sub>L</sub> =200mA.

Note2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and I<sub>L</sub> =200mA. The LED lifetime could be decreased if operating I<sub>L</sub> is larger than200mA.

Note3: LED Power Consumption: 1920mW Typ.

#### LED CIRCUIT DIAGRAM:



## 8. Command/AC Timing

### 8.1 TTL mode AC electrical Characteristics

| Parameter              | Symbol | Spec |      |      | Unit | Condition   |
|------------------------|--------|------|------|------|------|---|
|                        |        | Min. | Typ. | Max. |      |   |
| VDD Power On Slew rate | TPOR   | -    | -    | 20   | ms   | From 0V to 90% VDD  |
| RSTB pulse width       | TRst   | 50   | -    | -    | us   | DCLK=65MHz  |
| DCLK cycle time        | Tcph   | 14   | -    | -    | ns   | -   |
| DCLK pulse duty        | Tcwh   | 40   | 50   | 60   | %    | -   |
| VSD setup time         | Tvst   | 5    | -    | -    | ns   | -   |
| VSD hold time          | Tvhd   | 5    | -    | -    | ns   | -   |
| HSD setup time         | Thst   | 5    | -    | -    | ns   | -   |
| HSD hold time          | Thhd   | 5    | -    | -    | ns   | -   |
| Data set-up time       | Tdsu   | 5    | -    | -    | ns   | D0[7:0], D1[7:0], D2[7:0] to DCLK                                       |
| Data hold time         | Tdhd   | 5    | -    | -    | ns   | D0[7:0], D1[7:0], D2[7:0] to DCLK                                       |
| DE setup time          | Tesu   | 5    | -    | -    | ns   |   |
| DE hold time           | Tehd   | 5    | -    | -    | ns   |   |
| Output stable time     | Tsst   | -    | -    | 6    | us   | 10% to 90% target voltage.<br>CL=90Pf, R=10K ohm<br>(Cascade) Dual gate |
|                        |        | -    | -    | 3    |      |   |

Table: TTL mode AC electrical characteristics

### 8.2 LVDS mode AC electrical characteristics

| Parameter              | Symbol | Spec |                             |      | Unit | Condition                                  |
|------------------------|--------|------|-----------------------------|------|------|--|
|                        |        | Min. | Typ.                        | Max. |      |  |
| Clock Frequency        | RXFCLK | 20   | -                           | 71   | MHz  |  |
| Input data skew margin | TRSKM  | 500  | -                           | -    | ps   | VID   =400mV<br>RXVCM=1.2V<br>RXFCLK=71MHz |
| Clock high time        | TLVCH  | -    | $4/(7 \cdot \text{RXFCLK})$ | -    | ns   |  |
| Clock low time         | TLVCL  | -    | $3/(7 \cdot \text{RXFCLK})$ | -    | ns   |  |
| PLL wake-up time       | TemPLL | -    | -                           | 150  | us   |  |

Table: LVDS mode AC electrical characteristics

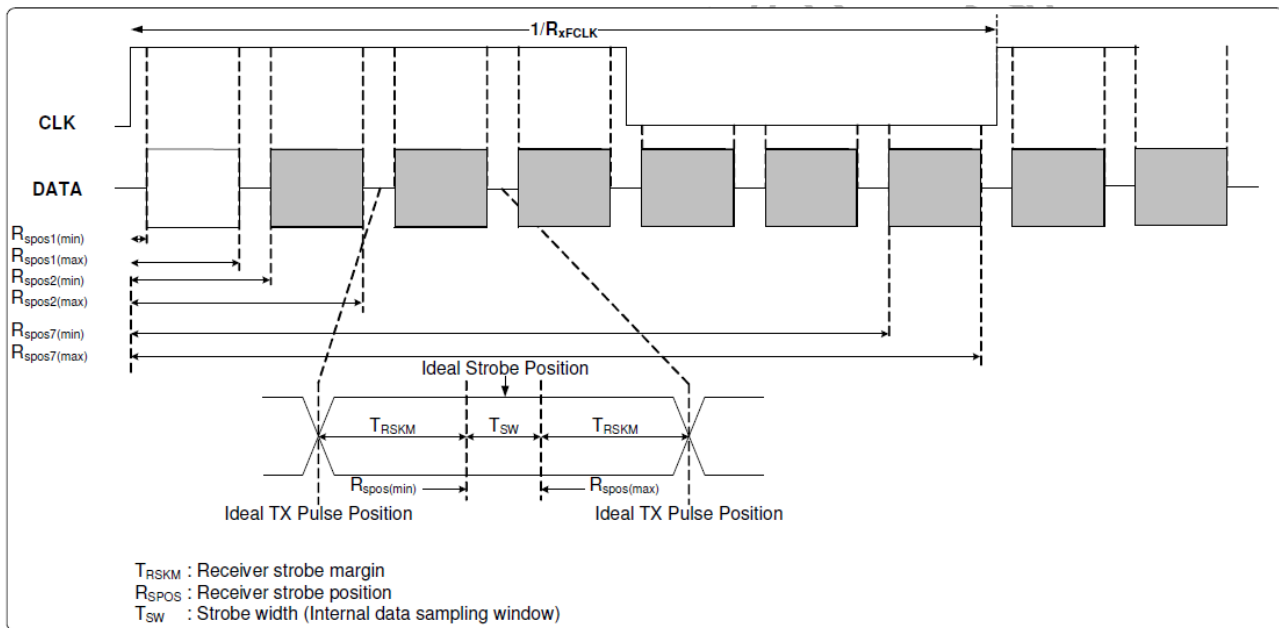
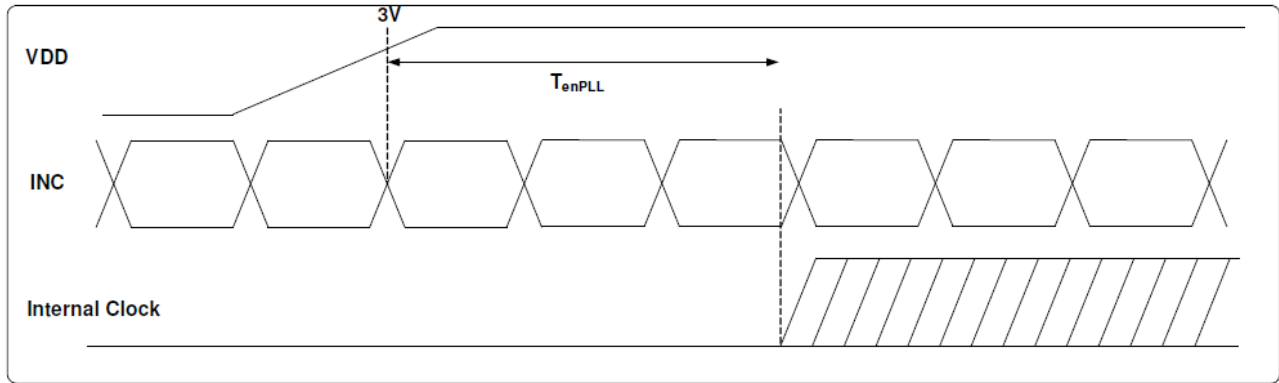
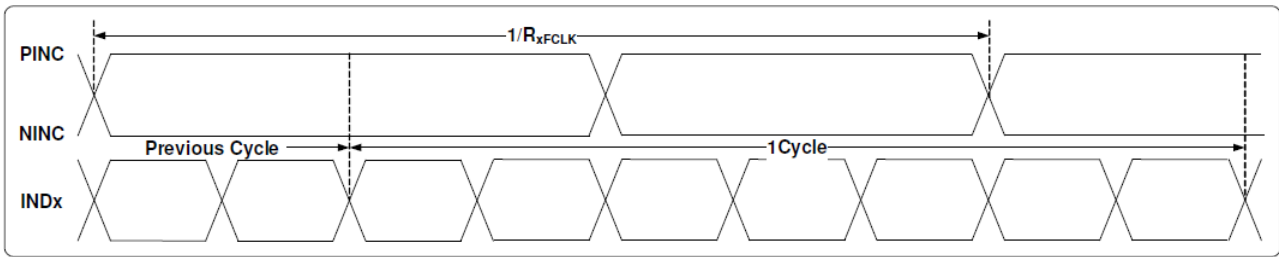


Figure: LVDS figure

| Parameter            | Symbol | Spec |      |      | Unit | Condition                            |
|----------------------|--------|------|------|------|------|--------------------------------------|
|                      |        | Min. | Typ. | Max. |      |                                      |
| Modulation Frequency | SSCMF  | 23   | -    | 93   | KHz  |                                      |
| Modulation Rate      | SSCMR  | -    | -    | +/-3 | %    | LVDS<br>clock=71MHz<br>center spread |

### 8.3. Data input format

#### 8.3.1. TTL mode data input format

Vertical timing

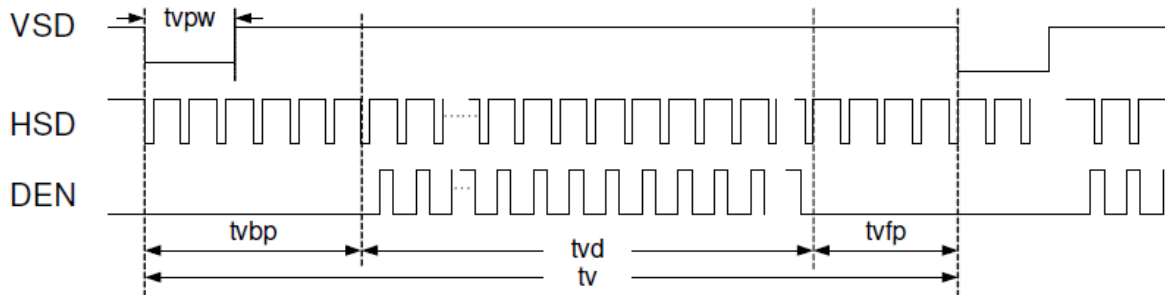


Figure: Vertical input timing diagram

Horizontal timing

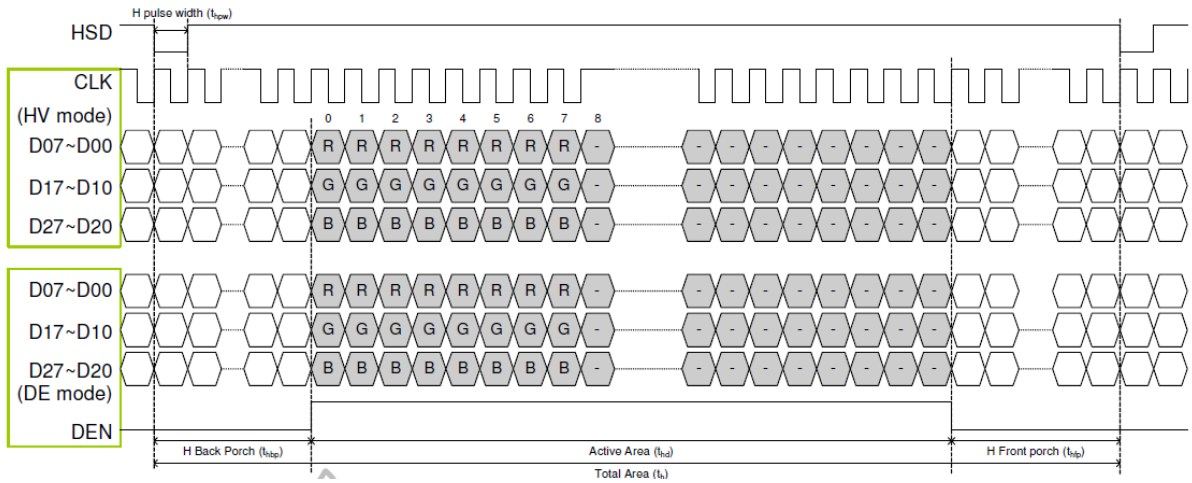


Figure: Horizontal input timing diagram

### 8.4. LVDS mode data input format

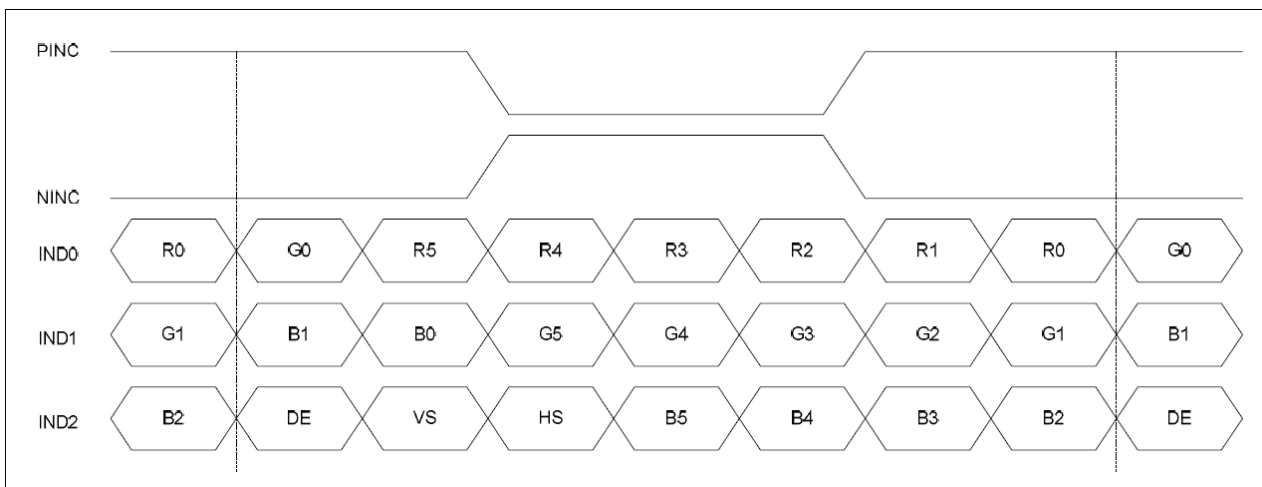


Figure: 6-bit LVDS input

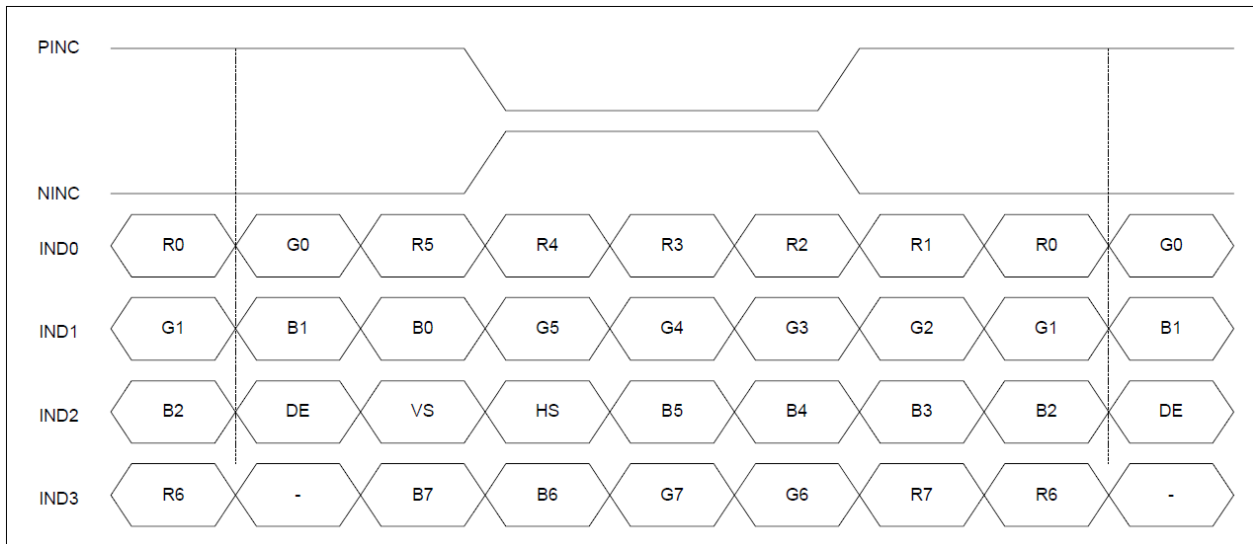


Figure: 8-bit LVDS Input

### 8.5. Timing diagram

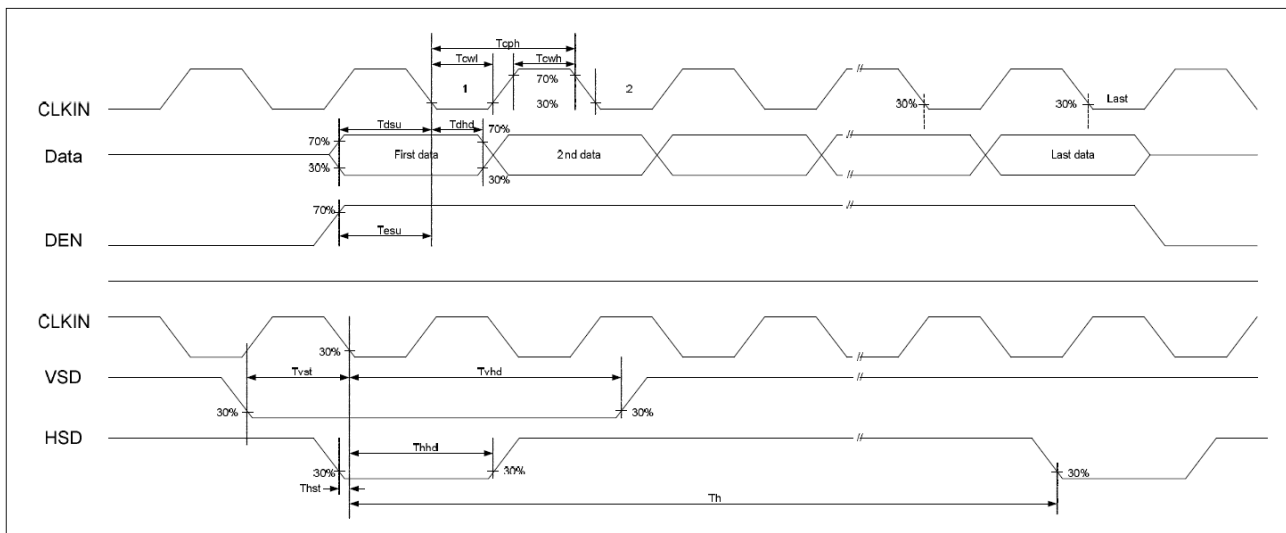


Figure: Input clock and data timing diagram

### 8.6. Power ON/OFF Sequence

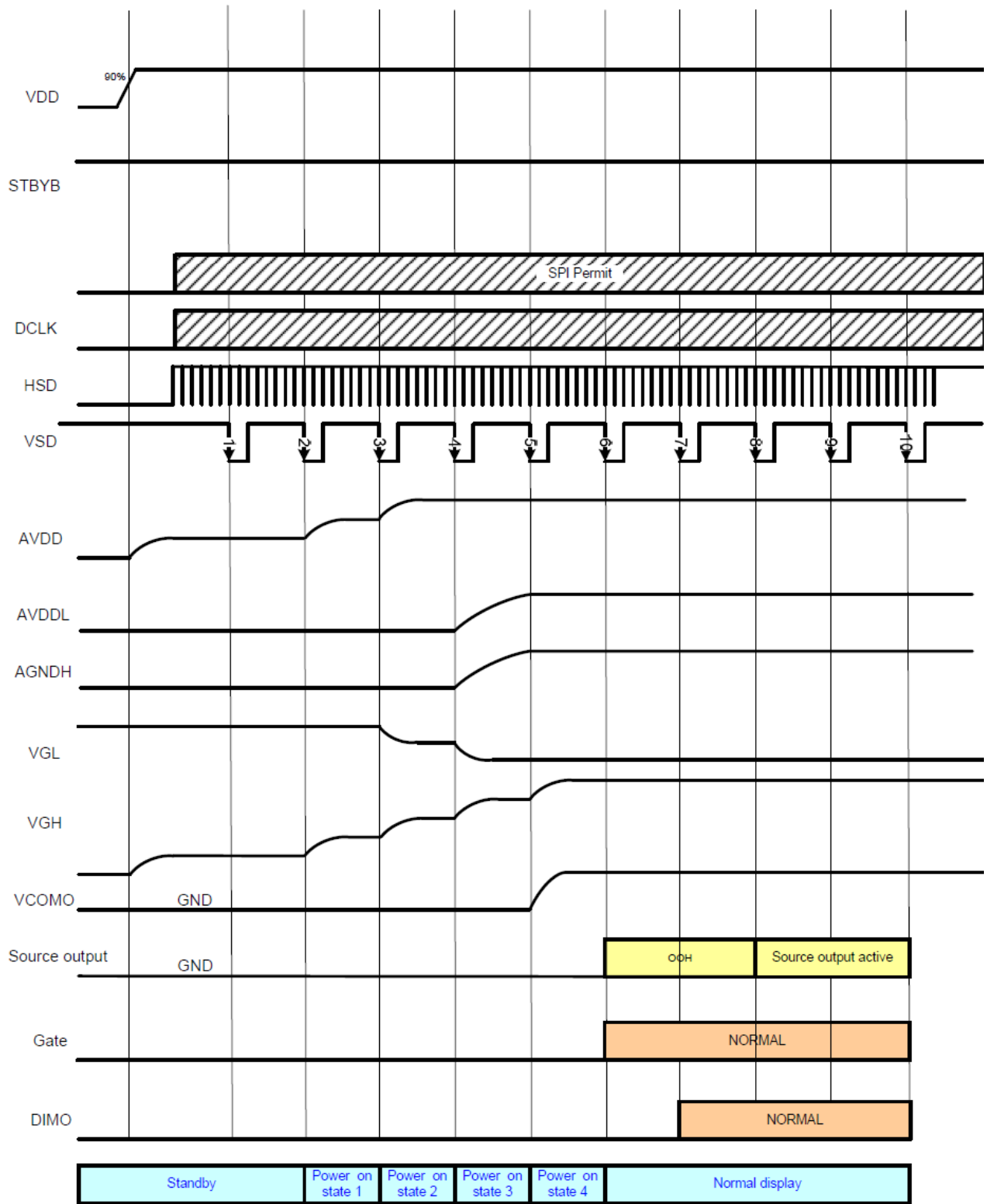
To prevent the device damage from latch up, the power on/off sequence shown below must be followed.

Power on: VDD, GND → AVDD, AGND → V1 to V14

Power off: V1 to V14 → AVDD, AGND → VDD, GND

#### 8.6.1. Power ON/OFF Control

HX8282A has a power on/off sequence control function. In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Please refer to “AC Characteristics” for more detail on timing.



Note: Low level = 3FH, when NBW=L (Normally white)  
 Low level = 00H, when NBW=H (Normally black)

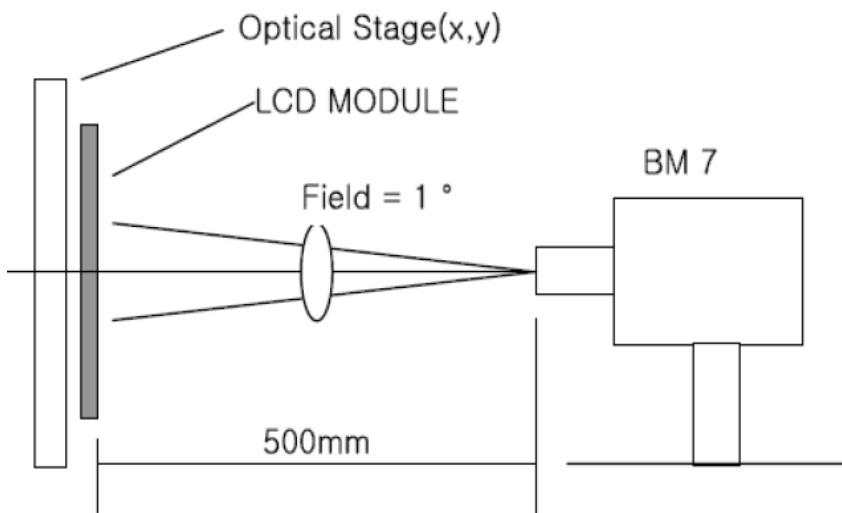
Figure: Power on/off timing sequence

### 9. Optical Specification

Ta=25°C

| Item           | Symbol     | Condition          | Min              | Typ.     | Max.  | Unit     | Remark         |
|----------------|------------|--------------------|------------------|----------|-------|----------|----------------|
| Contrast Ratio | CR         | $\Theta=0^{\circ}$ | 500              | 800      | -     |          | Note1<br>Note2 |
| Response Time  | Tr+Tf      | 25°C               | -                | 25       | 40    | ms       | Note1<br>Note3 |
| View Angles    | $\Theta T$ | CR $\geq 10$       | 80               | 85       | -     | Degree   | Note4          |
|                | $\Theta B$ |                    | 80               | 85       | -     |          |                |
|                | $\Theta L$ |                    | 80               | 85       | -     |          |                |
|                | $\Theta R$ |                    | 80               | 85       | -     |          |                |
| Chromaticity   | White      | X                  | Brightness is on | Typ-0.03 | 0.303 | Typ+0.03 | Note5<br>Note1 |
|                |            | Y                  |                  |          | 0.333 |          |                |
|                | Red        | X                  |                  |          | 0.618 |          |                |
|                |            | Y                  |                  |          | 0.326 |          |                |
|                | Green      | X                  |                  |          | 0.285 |          |                |
|                |            | Y                  |                  |          | 0.539 |          |                |
|                | Blue       | X                  |                  |          | 0.146 |          |                |
|                |            | Y                  |                  |          | 0.148 |          |                |
| Luminance      | L          |                    | -                | 420      | -     | cd/m2    | Note1<br>Note6 |
| Uniformity     | U          |                    | 75               | 80       | -     | %        | Note1<br>Note7 |

Note 1: Definition of optical measurement system.  
 Temperature = 25°C(±3°C)  
 LED back-light: ON, Environment brightness < 150 lx

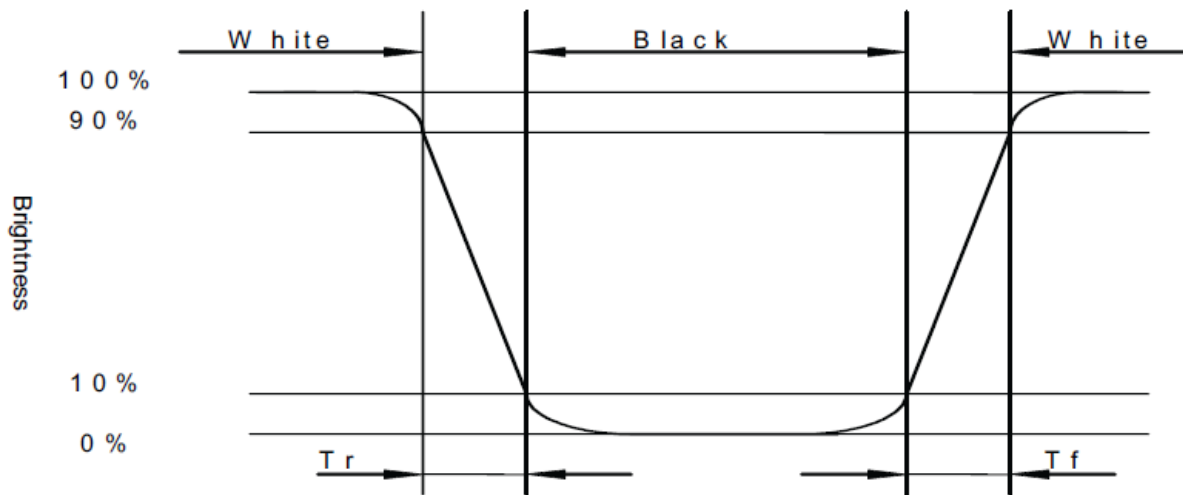


Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

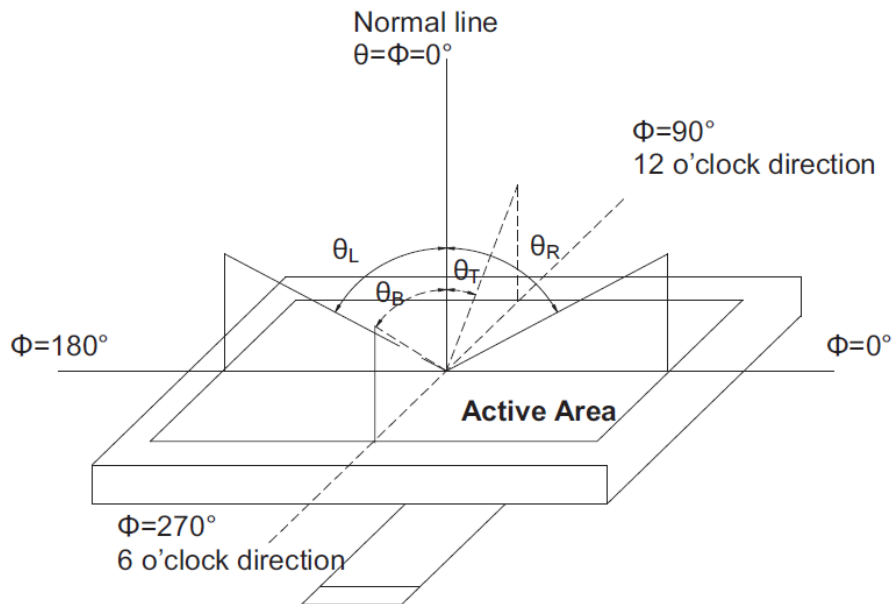
Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time, Tr) and from white to black(Decay Time, Tf).



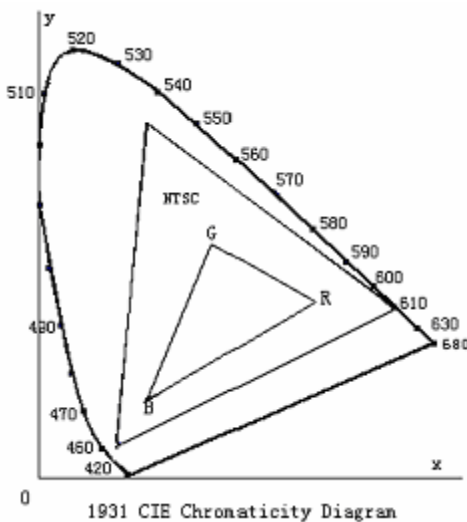
Note 4: Viewing angle range is defined as follow:

Viewing angle is measured at the center point of the LCD.



Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.



$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels “White” at the center of display area on optimum contrast.

Note 7: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Uniformity}(U) = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$

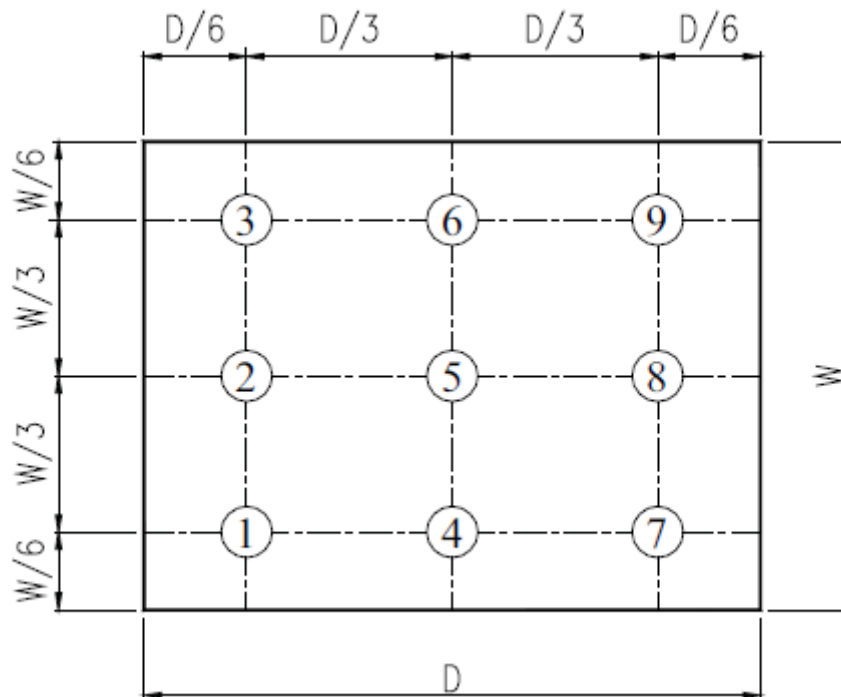


Fig. 2 Definition of uniformity

## 10. Environmental / Reliability Tests

| No | Test Item                         | Condition  | Judgment criteria   |
|----|-----------------------------------|--|---|
| 1  | High Temp Operation               | Ta=+70°C, 96hrs  | Per table in below  |
| 2  | Low Temp Operation                | Ta=-20°C, 96hrs  | Per table in below  |
| 3  | High Temp Storage                 | Ta=+80°C, 96hrs  | Per table in below  |
| 4  | Low Temp Storage                  | Ta=-30°C, 96hrs  | Per table in below  |
| 5  | High Temp & High Humidity Storage | Ta=+60°C, 90% RH<br>96 hours                             | Per table in below<br>(polarizer discoloration is excluded) |
| 6  | Thermal Shock<br>(Non-operation)  | -30°C 30 min~+80°C 30 min,<br>Change time:5min, 5 Cycles | Per table in below  |
| 7  | ESD (Operation)                   | Air discharge:+/-8KV,<br>Contact discharge:4KV           | Per table in below  |
| 8  | Vibration<br>(Non-operation)      | 10Hz~150Hz, 100m/s <sup>2</sup> , 120min                 | Per table in below  |
| 9  | Shock<br>(Non-operation)          | Half- sine wave,300m/s <sup>2</sup> ,11ms                | Per table in below  |
| 10 | Package Drop Test                 | Height:80 cm,<br>1 corner, 3 edges, 6 surfaces           | Per table in below  |

| INSPECTION             | CRITERION(after test)   |
|------------------------|---|
| Appearance             | No Crack on the FPC, on the LCD Panel   |
| Alignment of LCD Panel | No Bubbles in the LCD Panel<br>No other Defects of Alignment in Active area         |
| Electrical current     | Within device specifications  |
| Function / Display     | No Broken Circuit, No Short Circuit or No Black line<br>No Other Defects of Display |

## 11. Precautions for Use of LCD Modules

### 11.1 Safety

The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

### 11.2 Handling

- A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability
- C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.
- D. Provide a space so that the panel does not come into contact with other components.
- E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.
- F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.
- G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.
- H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

### 11.3 Static Electricity

- A. Ground soldering iron tips, tools and testers when they are in operation.
- B. Ground your body when handling the products.
- C. Power on the LCD module before applying the voltage to the input terminals.
- D. Do not apply voltage which exceeds the absolute maximum rating.
- E. Store the products in an anti-electrostatic bag or container.

### 11.4 Storage

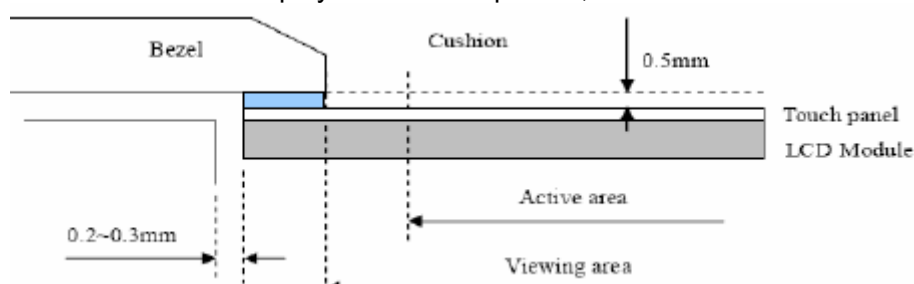
- A. Store the products in a dark place at  $+25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.
- B. Storage in a clean environment, free from dust, active gas, and solvent.

### 11.5 Cleaning

- A. Do not wipe the touch panel with dry cloth, as it may cause scratch.
- B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

### 11.6 Cautions for installing and assembling

- A. Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.
- B. In order to make the display assembly stable and firm, Displaytech recommends to design some supporting at the display backside, especially for the display with tape-attached touch panel, such supporting is important and essential, or else, the display may drop-off from front after some period of time.
- C. Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure. If the screen is displayed with fixed pattern, use a screen saver.



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [TFT Displays & Accessories category](#):*

*Click to view products by [Displaytech manufacturer](#):*

Other Similar products are found below :

[F3ET2-005-150](#) [HDA430T-3G1H](#) [NL8048AC19-14F](#) [NL6448BC20-21D](#) [NB7W-KBA04](#) [NB-ATT01](#) [NB5Q-ATT01](#) [NB5Q-KBA04](#) [NB-CN001](#) [OAI-80038AA-2008-A](#) [315-U004B15300](#) [UMSH-8596MD-34T \(REV D\)](#) [TX14D23VM5BAA](#) [TCG121WXLRXVNNANX35](#) [EIC-LCD-1080P](#) [T-55619GD065J-LW-ABN](#) [TCG104SVLPEANN-AN30](#) [NL6448BC33-70](#) [NL6448BC20-30D](#) [NL10276BC16-06](#) [NL192108AC10-01D](#) [NL12880BC20-05BD](#) [NL8060BC26-35BA](#) [NL8060BC31-50F](#) [TM070DDHG03-40](#) [PTPW16-070WV1S02](#) [PTPW17-070WV1S02](#) [PTPW16-084SV1S02](#) [MTD0300ECP06DF-1](#) [DEM 640480E](#) [TMH-PW-N \(A-TOUCH\)](#) [RFA6400E-AWH-DNG](#) [RFA6400E-AWH-MNN](#) [RFE430V-AZW-DNS](#) [RFF70VA2-1IW-DHS](#) [RFH1010J-AYH-MNB](#) [RFH700A8-AYH-MNN](#) [RFK101VF-1YH-LHG](#) [RFS390C-AIW-DNN](#) [RFS390C-AIW-DNS](#) [RFS52VA-1ZH-DHN](#) [SM-RVT101HVHFWCA0](#) [SM-RVT101HVHFWN00](#) [SM-RVT101HVHNWC00](#) [SM-RVT101HVHNWC00-B](#) [SM-RVT101HVHNWCA0](#) [SM-RVT101HVHNWN00](#) [SM-RVT101HVLFWCA0](#) [SM-RVT101HVLNWCA0](#) [SM-RVT3.5A320240TFWN00](#) [SM-RVT35HHTFWCA0](#)