



深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAYTECH. CO, TD.

TFT-LCD Module Specification

Module NO.: TST070HDHF-A00

Version: V1.0

APPROVAL FOR SPECIFICATION

APPROVAL FOR SAMPLE

| For Customer' s Acceptance: | |
|-----------------------------|---------|
| Approved by | Comment |
| | |

| Team Source Display: | | |
|----------------------|-------------|--------------|
| Presented by | Reviewed by | Organized by |
| | | |

| Version No. | Date | Content | Remark |
|-------------|------------|----------------|--------|
| V1.0 | 2021-11-05 | First Released | |
| | | | |

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1.0 GENERAL DESCRIPTION

1.1 Introduction

TST070HDHF-A00 is a color active matrix thin film transistor liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 7 inch diagonally measured active display area with HD (1280 horizontal by 768 vertical pixel) resolution.

1.2 Features

- 7 (15:9 diagonal) inch configuration
- 16.7M color by 8-bit, one port LVDS Interface
- ROHS Compliance & Halogen Free

1.3 Applications

- TFT LCD Monitor
- Industrial Application
- Amusement
- Vehicle

1.4 General information

| Item | | Specification | Unit |
|-------------------|------------------------------|--|--------|
| Outline Dimension | | 164.06 (H) x 104.66 (V) x 6.29 (D) (Typ) | mm |
| Display area | | 152.45(H) x 91.47(V) | mm |
| Number of Pixel | | 1280(H) x 768(V) | pixels |
| Pixel pitch | | 0.1911(H) x 0.1911(V) | mm |
| Pixel arrangement | | RGB Vertical Stripe | |
| Display mode | | Normally Black | |
| NTSC | | 70 (Typ.) | % |
| Surface treatment | | HC | |
| Back-light | | Single LED (Side-Light type) | |
| Power Consumption | Logic System (White Pattern) | 1.2(Max.) | W |
| | B/L System | 7.344(Max.) | W |

1.5 Mechanical Information

| Item | | Min. | Typ. | Max. | Unit |
|-------------|----------------|--------|--------|--------|------|
| Module Size | Horizontal (H) | 163.76 | 164.06 | 164.36 | mm |
| | Vertical (V) | 104.36 | 104.66 | 104.96 | mm |
| | Depth (D) | 5.99 | 6.29 | 6.59 | mm |
| Weight | | — | TBD | — | g |

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

| Item | Symbol | Min. | Max. | Unit | Note |
|----------------------|--------|------|------|------|------|
| Logic Supply Voltage | VDD | -0.3 | +4.0 | V | - |

2.2 Environment Absolute Rating

| Item | Symbol | Min. | Max. | Unit | Note |
|-----------------------|------------------|------|------|------|------|
| Operating Temperature | T _{opa} | -30 | 85 | °C | |
| Storage Temperature | T _{stg} | -40 | 90 | °C | |

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|------------------------------|------------------|--------------------------|-------|-------|-------|-------------------|--------|
| Contrast | CR | | 1000 | 1400 | — | | (1)(2) |
| Response time | 25°C | TR+TF | — | 30 | 40 | msec | (1)(3) |
| | 0°C | | — | — | 150 | | |
| | -20°C | | — | — | 200 | | |
| | -30°C | | — | — | 400 | | |
| White luminance (Center) | Y _L | Θ=0 Normal viewing angle | 900 | 1000 | — | cd/m ² | (1)(4) |
| Color chromaticity (CIE1931) | White | W _x | ±0.04 | 0.304 | ±0.04 | | (1)(4) |
| | | W _y | | 0.311 | | | |
| | Red | R _x | | TBD | | | |
| | | R _y | | TBD | | | |
| | Green | G _x | | TBD | | | |
| | | G _y | | TBD | | | |
| | Blue | B _x | | TBD | | | |
| | | B _y | | TBD | | | |
| Viewing angle | Hor. | Θ _L | 80 | — | — | | |
| | | Θ _R | 80 | — | — | | |
| | Ver. | Θ _U | 80 | — | — | | |
| | | Θ _D | 80 | — | — | | |
| Brightness uniformity | B _{UNI} | Θ=0 | 70 | 75 | — | % | (5) |
| Optima View Direction | Free | | | | | | (6) |

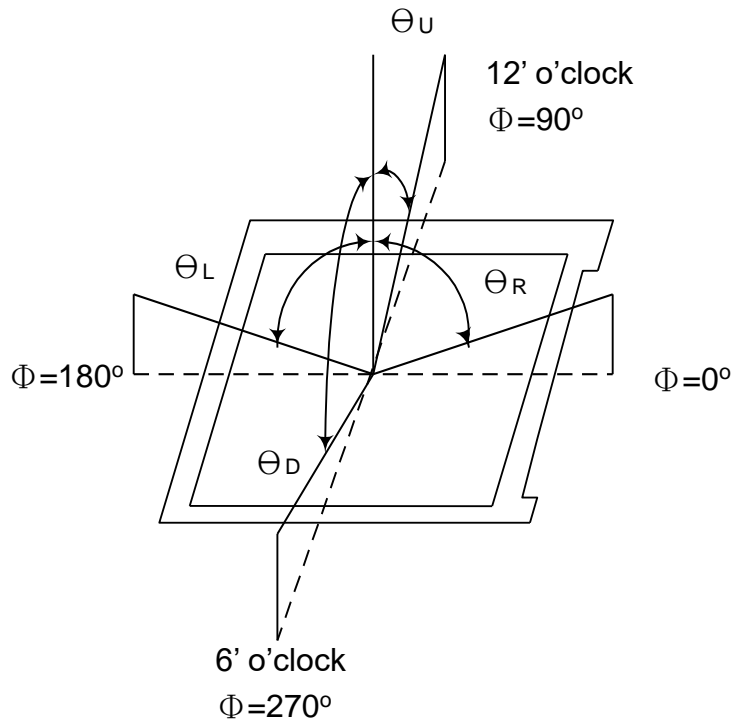
Measuring Condition

- Measuring surrounding : dark room
- LED current: I_L
- Ambient temperature : 25±2°C
- 15min. warm-up time.

3.3 Measuring Equipment

- BM-7A for other optical characteristics
- Measuring spot size : 20 ~ 21 mm

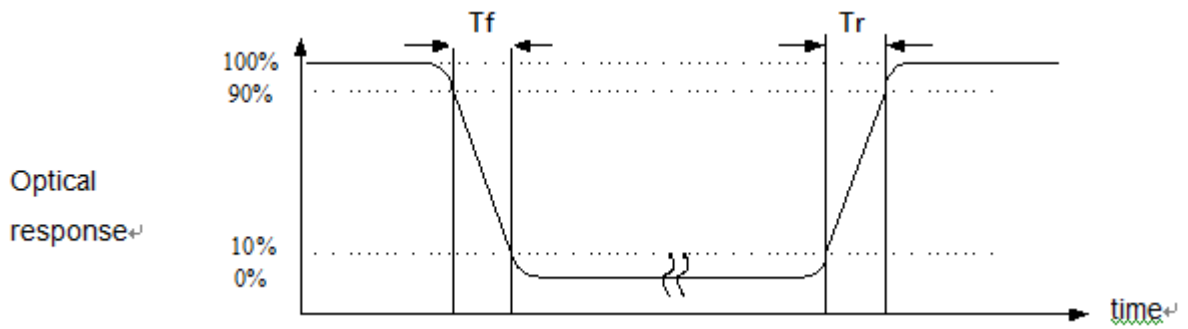
Note (1) Definition of Viewing Angle:



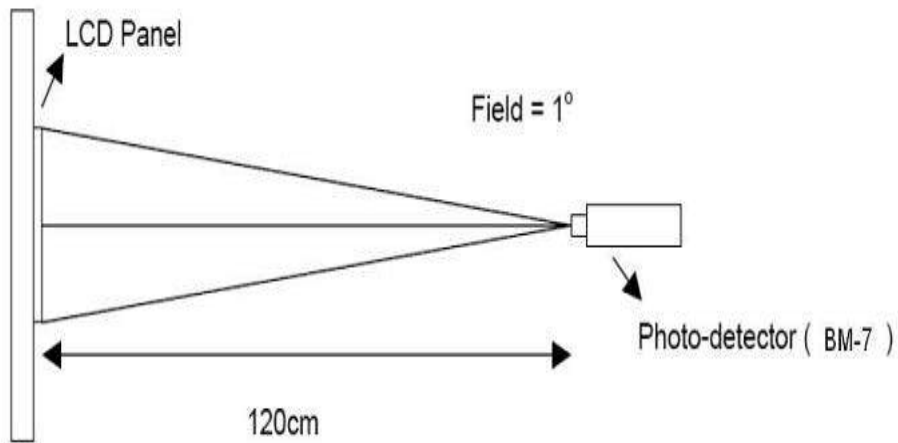
Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

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

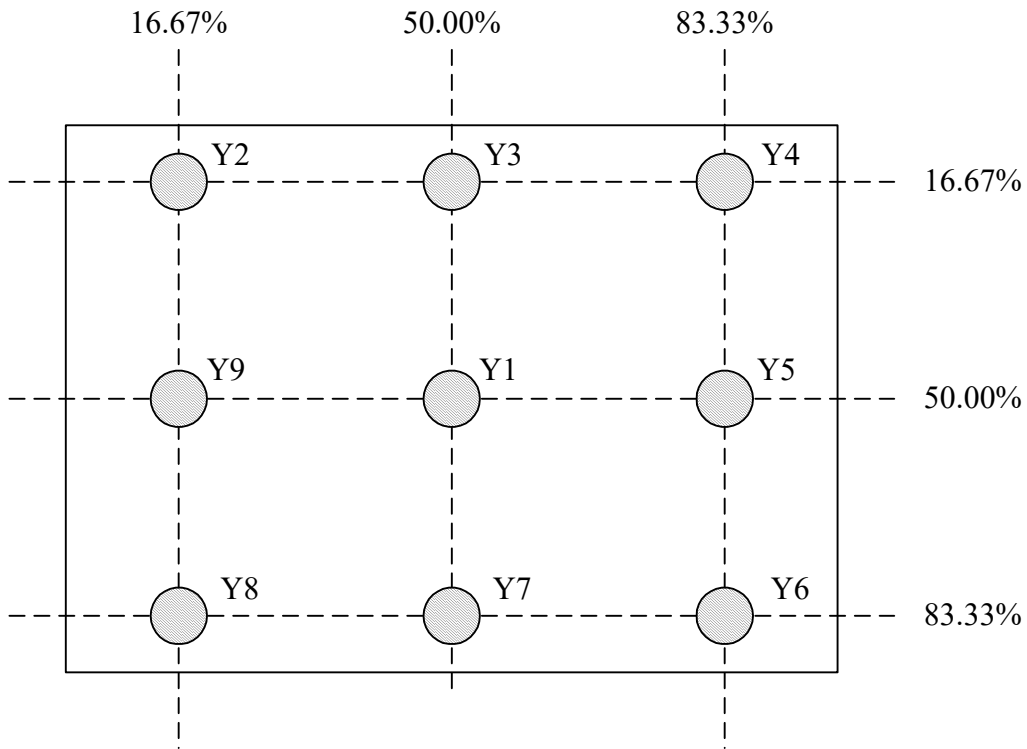
Note (3) Definition of Response Time : Sum of T_R and T_F



Note (4) Definition of optical measurement setup



Note (5) Definition of brightness uniformity

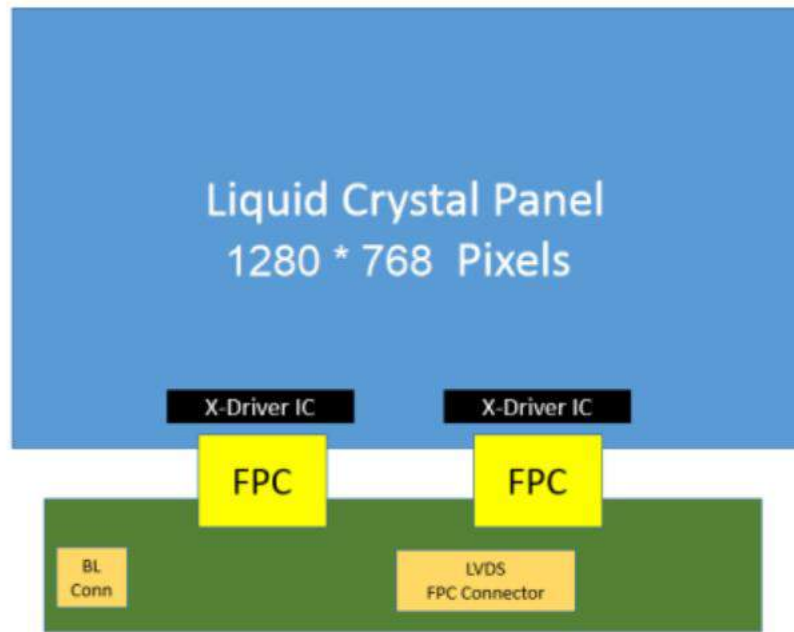


$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

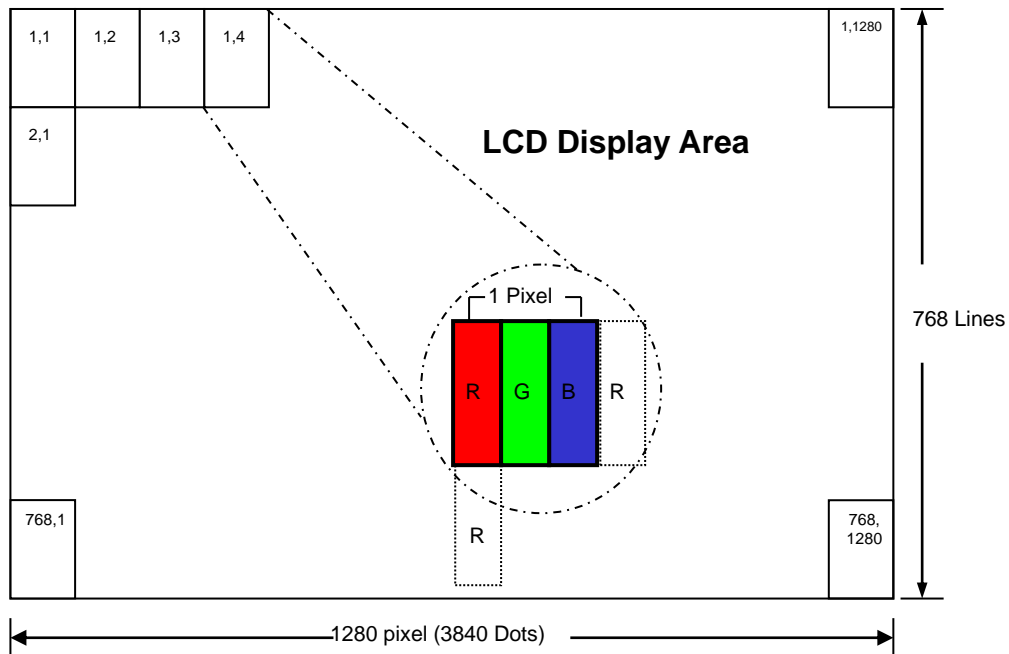
Note (6) : Rubbing Direction. The different Rubbing Direction will cause the different optima view direction.

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module:



4.2 Pixel Format



4.3 Relationship Between Displayed Color and Input

| | Display | MSB | | | | LSB | | | | MSB | | | | LSB | | | | MSB | | | | LSB | | | | Gray scale Level |
|-----------------------------|-------------------------|-----|----|----|----|-----|----|----|----|-----|----|----|----|-----|----|----|----|-----|----|----|----|-----|------------|-----------|------|------------------|
| | | R7 | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 | |
| Basic color | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | - |
| | Blue | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | - |
| | Green | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | - |
| | Light Blue | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | - |
| | Red | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | - |
| | Purple | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | - |
| | Yellow | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | - |
| White | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | - | |
| Gray scale of Red | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
| | Dark ↑ ↓ Light | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L1 |
| | | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L2 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | L3...L251 |
| | | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L252 |
| | H | H | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L253 | |
| | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L254 | |
| Red | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | Red L255 | | |
| Gray scale of Green | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
| | Dark ↑ ↓ Light | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L1 |
| | | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L2 | |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | L3...L251 |
| | | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L252 | |
| | L | L | L | L | L | L | L | L | H | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L253 | | |
| | L | L | L | L | L | L | L | L | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L254 | | |
| Green | L | L | L | L | L | L | L | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | Green L255 | | | |
| Gray scale of Blue | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
| | Dark ↑ ↓ Light | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L1 |
| | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L2 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | L3...L251 |
| | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L252 |
| | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | H | L | L253 | |
| | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | L | L | L254 | |
| Blue | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | Blue L255 | | |
| Gray scale of White & Black | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
| | Dark ↑ ↓ Light | L | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L | L | L | L | L | L | H | L | L1 |
| | | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L | L | L | L | L | L | H | L | L2 | |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | L3...L251 |
| | | H | H | H | H | H | L | L | H | H | H | H | L | L | H | H | H | H | L | L | H | H | H | H | L | L |
| | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | L253 |
| | H | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | L254 |
| White | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | White L255 |

5.0 INTERFACE PIN CONNECTION

5.1 FPC Pin Assignment:

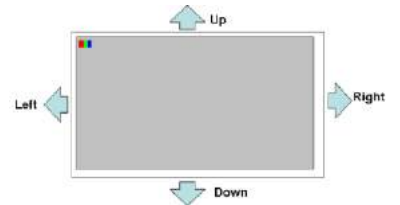
FPC connector is used for electronics interface. The recommended model is CN1 (Input signal): NPN 40561W90

| Pin NO. | Symbol | I/O | Description | Note |
|---------|--------------|-----|--|------|
| 1 | LEDA | P | LED Anode | |
| 2 | LEDA | P | LED Anode | |
| 3 | LEDA | P | LED Anode | |
| 4 | NC | - | No connection | |
| 5 | LEDK | P | LED Anode | |
| 6 | LEDK | P | LED Anode | |
| 7 | LEDK | P | LED Anode | |
| 8 | 12C_SCL | I | Serial interface clock input for I2C interface (Please Pull H with 4.7KΩ resistance) | |
| 9 | 12C_SDA | I/O | Serial Interface address and data input/output for I2C interface (Please Pull H with 4.7KΩ resistance) | |
| 10 | OTP | I | Power input for OTP programming. Leave this pin open or Connect it to VCC when not programming OTP | |
| 11 | NTC | P | Thermistor pin | |
| 12 | NTC | P | Thermistor pin | |
| 13 | VCC | P | Power for Digital Circuit | |
| 14 | VCC | P | Power for Digital Circuit | |
| 15 | GND | P | Power ground | |
| 16 | GND | P | Power ground | |
| 17 | Fail_DET | O | Error feedback | |
| 18 | STBYB | I | Standby mode setting pin. Active low, Timing controller, Output buffer, DAC and power circuit all off when STBYB is low (STBYB must meet the sequence of Driver IC when power on/off;) | |
| 19 | LR | I | Left/right selection | |
| 20 | UD | I | Up/down selection | |
| 21 | GND | P | Power ground | |
| 22 | LVDS_RX_IN3+ | I | LVDS data lane 3 Positive | |
| 23 | LVDS_RX_IN3- | I | LVDS data lane3 Negative | |
| 24 | GND | P | Power ground | |
| 25 | LVDS_CLK_IN+ | I | LVDS Clock Lane Positive | |
| 26 | LVDS_CLK_IN- | I | LVDS Clock Lane Negative | |
| 27 | GND | P | Power ground | |
| 28 | LVDS_RX_IN2+ | I | LVDS data lane 2 Positive | |

| | | | | |
|----|--------------|---|--|--|
| 29 | LVDS_RX_IN2- | I | LVDS data lane 2 Negative | |
| 30 | GND | P | Power ground | |
| 31 | LVDS_RX_IN1+ | I | LVDS data lane 1 Positive | |
| 32 | LVDS_RX_IN1- | I | LVDS data lane 1 Negative | |
| 33 | GND | P | Power ground | |
| 34 | LVDS_RX_IN0+ | I | LVDS data lane 0 Positive | |
| 35 | LVDS_RX_IN0- | I | LVDS data lane 0 Negative | |
| 36 | GND | P | Power ground | |
| 37 | RESET | I | Global Reset pin. Active low, If RESETB=0, the chip is in reset state. (RESETB must meet the sequence of Driver IC when power on/off; Add external RC circuit(R=10Kohm, C=1uF) to pin RESETB to start whole chip reset when power up | |
| 38 | GND | P | Power ground | |
| 39 | BRS | - | No connection | |
| 40 | GND | P | Power ground | |

Note 1 : UD and LR control function

| UPDN | SHLR | Data shifting |
|------|------|----------------------|
| VCC | VCC | Left→Right ; Up→Down |
| VCC | GND | Right→Left ; Up→Down |
| GND | VCC | Left→Right ; Down→Up |
| GND | GND | Right→Left ; Down→Up |



6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

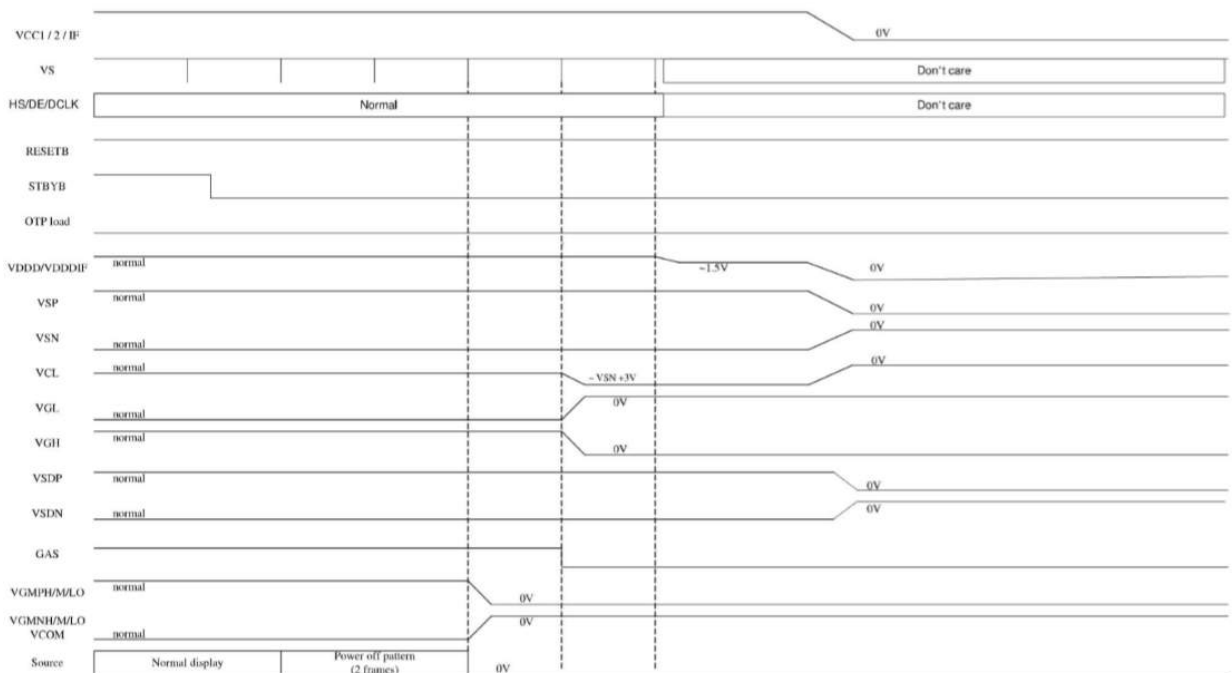
| Item | Symbol | Min. | Typ. | Max. | Unit | Note |
|--------------------------|-----------------|--------|-------|--------|------|------|
| Power voltage | VCC | 3.0 | 3.3 | 3.6 | V | |
| | VSP | 6.35 | 6.45 | 6.55 | V | |
| | VSN | -6.55 | -6.45 | -6.35 | V | |
| | VGH | 17.8 | 18 | 18.2 | V | |
| | VGL | -12 | -11.8 | -11.6 | V | |
| Input logic high voltage | V _{IH} | 0.7VCC | - | VCC | V | |
| Input logic low voltage | V _{IL} | 0 | - | 0.3VCC | V | |

Note :

- (1) : VCC setting should match the signals output voltage of customer's system board.
- (2) : Be sure to apply VCC and VGL to the LCD first, and then apply VGH.

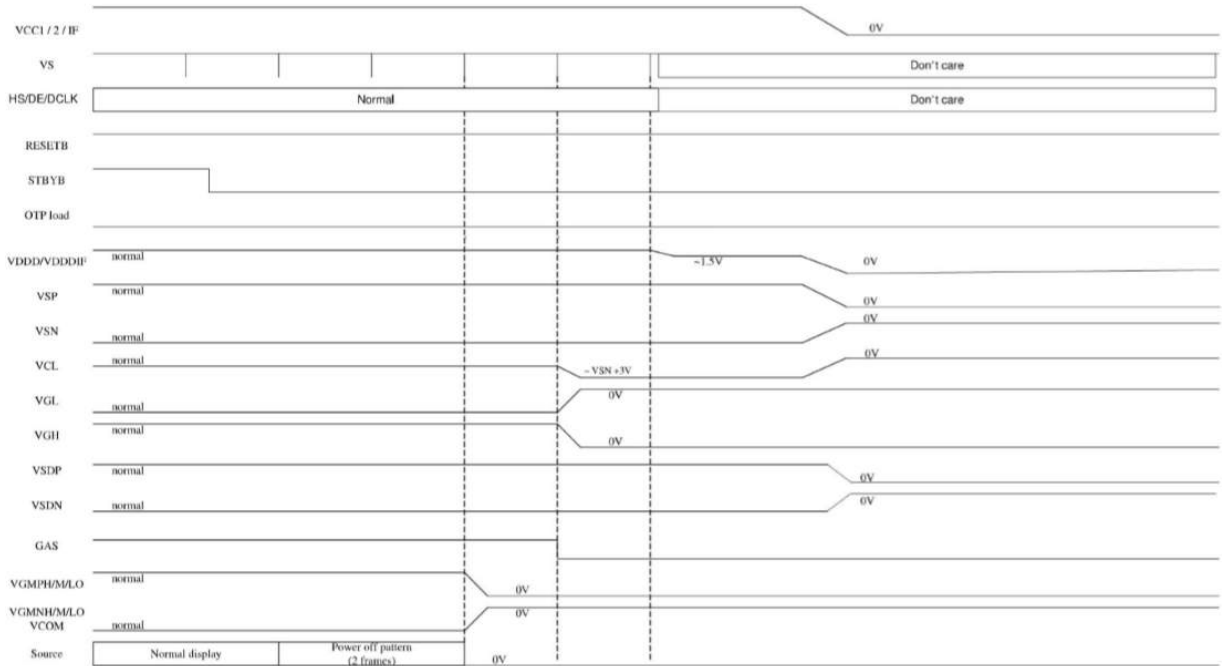
6.2 Power Sequence

A. If VSP and VSN are generated by PFM circuits:



Power-off sequence with PFM

B. If VSP=VSDP and VSN=VSDN by external power supply, VGH and VGL generated by internal charge pump circuits:



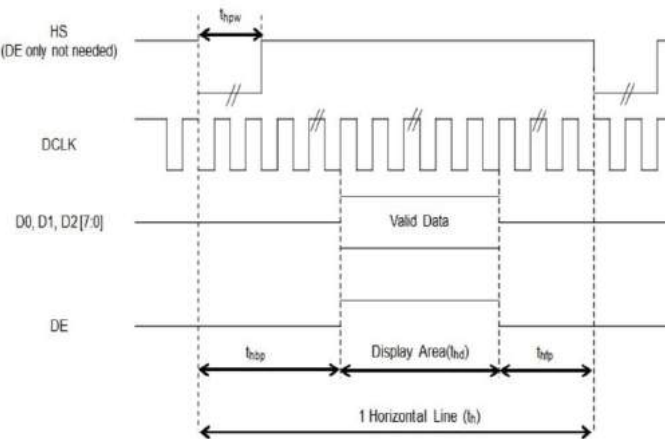
Power-off sequence with external power supply

6.3 Timing Characteristics

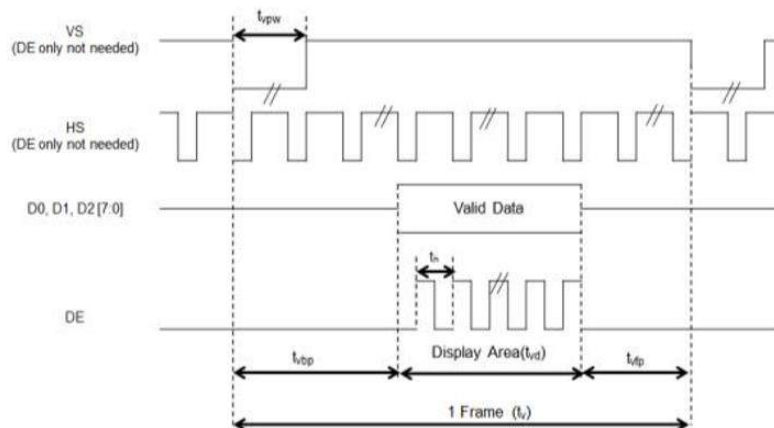
6.3.1 AC Electrical Characteristics

| Interface Timing (DE mode) One port LVDS Timing. (1280xRGBx768) | | | | | |
|--|------------|------|------|------|------|
| Item | Symbol | Min. | Typ. | Max. | Unit |
| Frame Rate | FR | 55 | 60 | 65 | Hz |
| Vertical Display Time | T_{vd} | 768 | | | H |
| Vertical pulse width | T_{vpw} | 4 | 4 | 20 | H |
| Vertical back porch | T_{vbp} | 24 | 24 | 42 | H |
| Vertical front porch | T_{vfp} | 20 | 20 | 40 | H |
| Frame Period | T_v | 812 | 812 | 850 | H |
| Horizontal Display Time | T_{hd} | 1280 | | | DCLK |
| Horizontal pulse width | T_{hpw} | 10 | 12 | 180 | DCLK |
| Horizontal back porch | T_{hbp} | 5 | 16 | 192 | DCLK |
| Horizontal front porch | T_{hfp} | 24 | 26 | 192 | DCLK |
| 1 Horizontal line | T_h | 1309 | 1322 | 1664 | DCLK |
| Clock Rate | F_{DCLK} | 58.5 | 64.4 | 85 | MHz |

(1) Horizontal input timing



(2) Vertical input timing

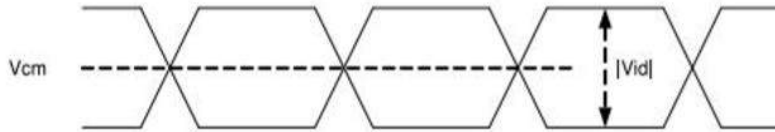


6.3.2 DC Electrical Characteristics

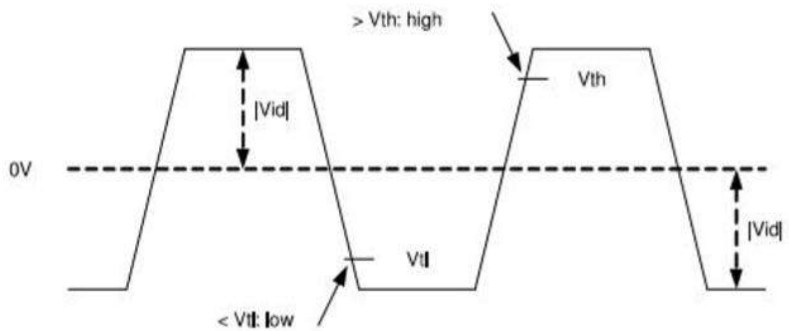
(VCC1=VCC2=VCCIF=2.7V to 3.6V, VSS1=VSS2=VSSA=0V, Top=-40~95°C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---------------------|-----------|------|------|--------------------------|------|
| Differential input high Threshold voltage | Vth | Vcm=1.2V | - | - | +0.1 | V |
| Differential input low threshold voltage | Vtl | - | -0.1 | - | - | V |
| Differential input common Mode voltage | V _{CM} | - | 1 | 1.2 | 1.7- V _{id} /2 | V |
| LVDS input voltage | VINLV | - | 0.7 | - | 1.7 | V |
| Differential input voltage | V _{id} | - | 0.1 | - | 0.6 | V |
| Differential input leakage current | I _{lvleak} | - | -10 | - | +10 | μA |

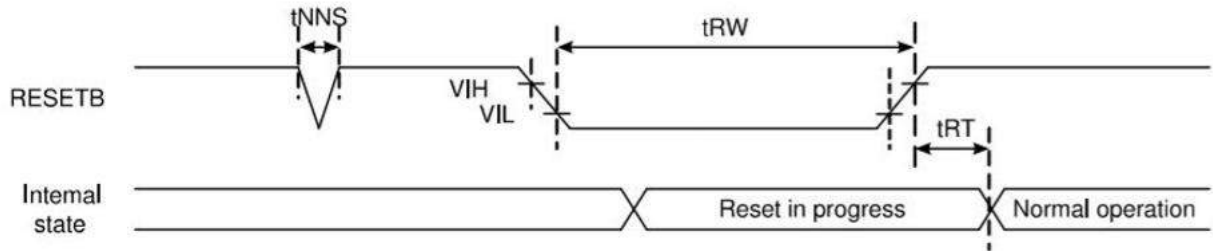
Single-ended:
 LVCLKP(R),
 LVCLKN(R),
 LVD[3:0]P(R),
 LVD[3:0]N(R)



Differential:
 LVCLKP(R)-LVCLKN(R),
 LVD[3:0]P(R)-
 LVD[3:0]N(R)



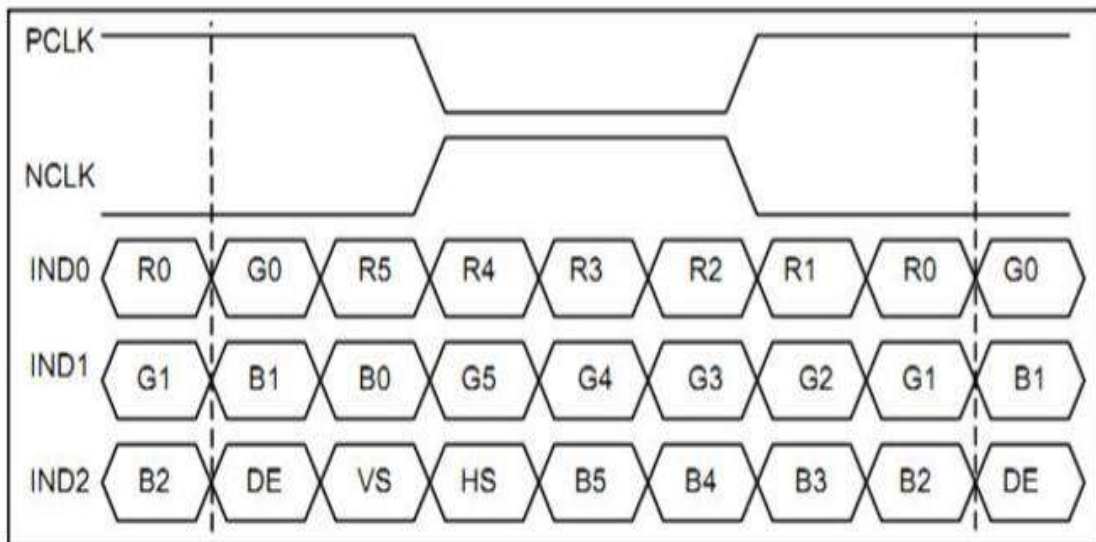
6.3.3 Reset timing



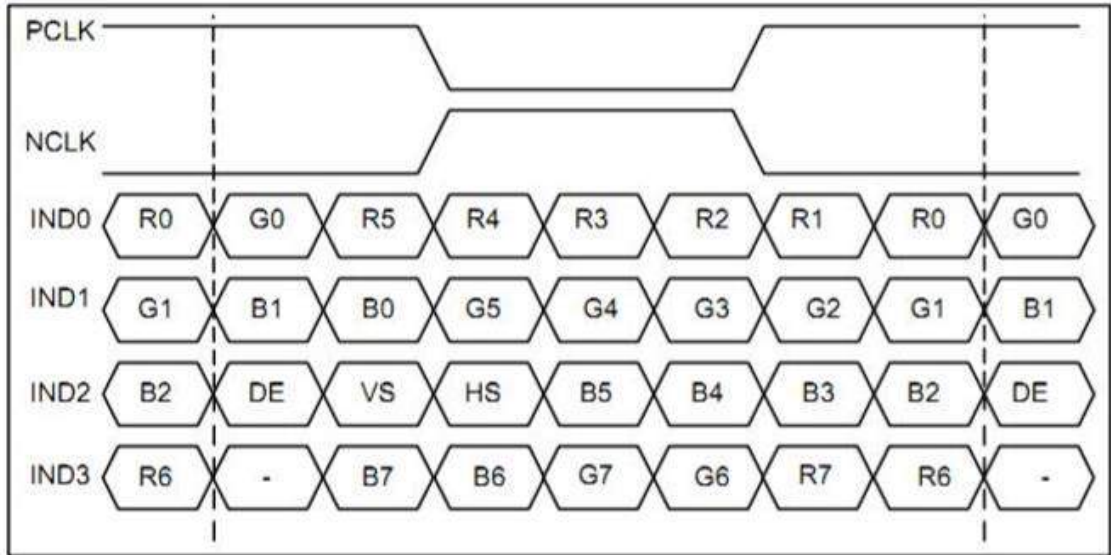
(VCC1=VCC2=VCCIF=2.7V to 3.6V, VSS1=VSS2=VSSA=0V, Top=-40~95°C)

| Signal | Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--------|----------------------------|--------|------|------|------|------|
| RESETB | Reset pulse width | tRW | 10 | - | - | μs |
| | Reset complete time | tRT | - | - | 5 | μs |
| | Negative spike noise width | tNNS | - | - | 100 | ns |

6.3.4 LVDS Data Input Format 6bit LVDS input(HSD=L)



8bit LVDS input(HSD=L)



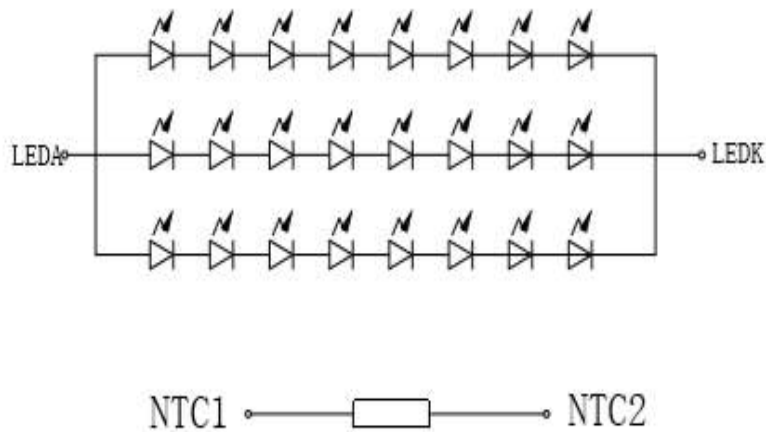
6.4 Backlight Unit

| Parameter | Symbol | Min | Typ | Max | Units | Condition |
|---------------|--------|--------|-----|------|-------|---|
| LED Current | I_L | -- | 270 | -- | mA | $T_a=25^{\circ}C$ |
| LED Voltage | V_L | 21.6 | 24 | 26.4 | Volt | $T_a=25^{\circ}C$ |
| LED Life-Time | N/A | 30,000 | -- | -- | Hour | $T_a=25^{\circ}C$ $I_F=90mA$ Note (2) |

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm 3^{\circ}C$, typical I_L value indicated in the above table until the brightness becomes less than 50%.

Note (2) The "LED life time" is defined as the module brightness decrease to 50% original brightness at $T_a=25^{\circ}C$ and $I_L(\text{typ})$. The LED lifetime could be decreased if operating I_L is larger than $I_L(\text{typ})$. The constant current driving method is suggested.

Note (3) LED Light Bar Circuit



7.0 RELIABILITY TEST ITEMS

| No. | Item | Conditions | Remark |
|-----|--|--|--------|
| 1 | High Temperature Storage | Ta=+90°C, 500hrs | |
| 2 | Low Temperature Storage | Ta=-40°C, 500hrs | |
| 3 | High Temperature Operation | Ta=+85°C,500hrs | |
| 4 | Low Temperature Operation | Ta=-30°C, 500hrs | |
| 5 | High Temperature and High Humidity (operation) | Ta=+60°C, 90%RH, 500hrs | |
| 6 | Thermal Cycling Test (non operation) | -30°C(30min) → +85°C(30min), 200 cycles | |
| 7 | Electrostatic Discharge | R=330Ω,C=150pF Contact = ± 8 kV, class B; Air = ± 15 kV, class B; 1 sec, 9 point, 10 times/point. | |
| 8 | Vibration | Sweep: 10Hz~55Hz~10Hz 2G 2 hours for each direction of X.Y.Z. (6 hours for total) | |
| 9 | Vibration (with carton) | Random: 0.015G ² /Hz, 5~200Hz -6dB/Octave, 200~500Hz XYZ 2hrs/each direction(6 hours for total) | |
| 10 | Drop (with carton) | Height: 60 cm 1 corner, 3 edges, 6 surfaces | |

Note1: There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

Note2: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample shall be free from defects:

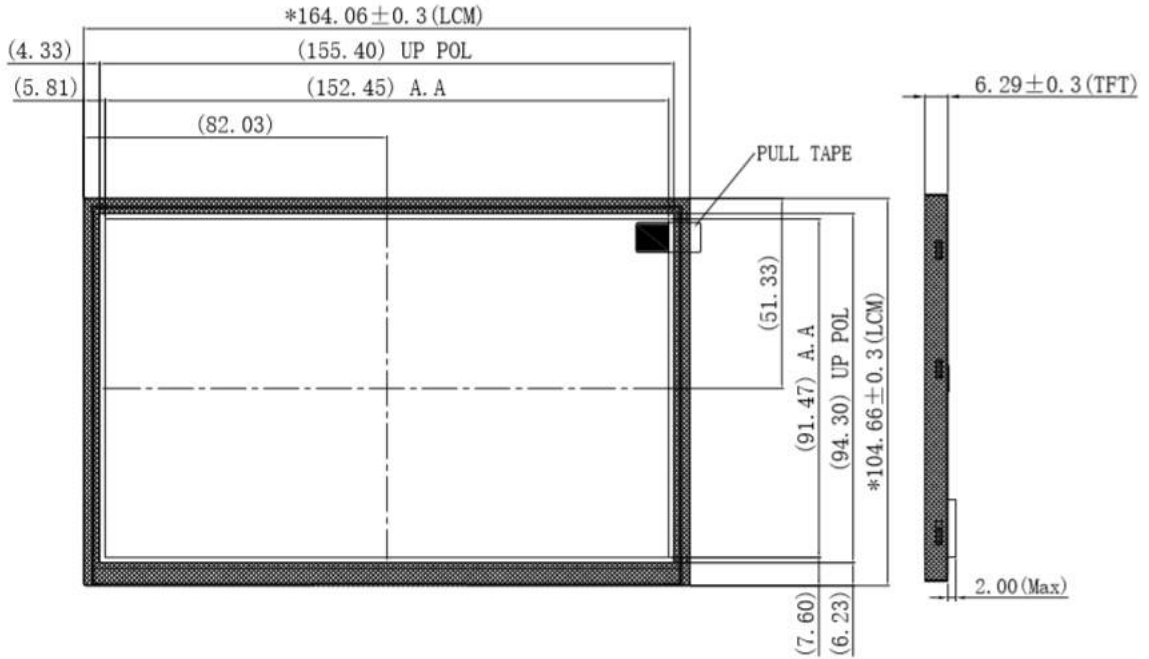
(Air bubble in the LCD 、 Seal leak 、 Non-display 、 Missing segments 、 Glass crack).

Note3 : The test condition definition panel's surface temperature.

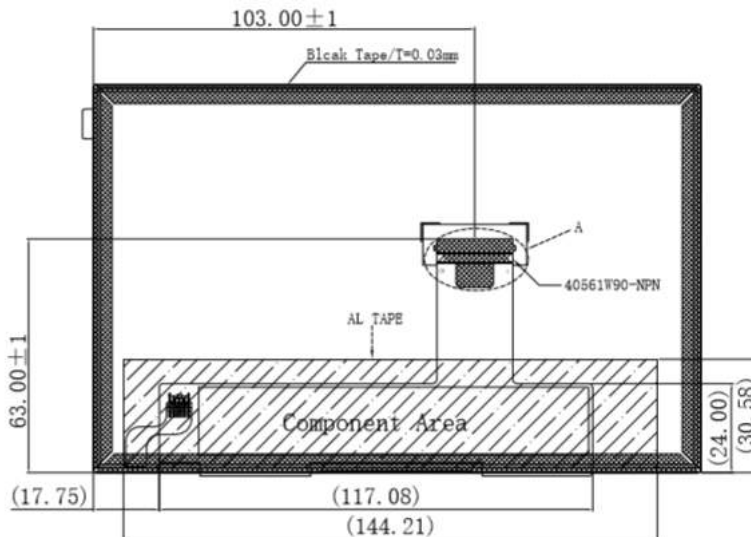
8.0 OUTLINE DIMENSION

General tolerance: $\pm 0.3\text{mm}$

8.1 Front View:



8.2 Rear View:





9.0 LOT MARK

TBD

10.0 PACKAGE SPECIFICATION

TBD

11.0 GENERAL PRECAUTION

11.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

11.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. TSD does not warrant the module, if customers disassemble or modify the module.

11.3 Breakage of LCD Panel

- 11.3.1. If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.
- 11.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- 11.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- 11.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

11.4 Electric Shock

- 11.4.1. Disconnect power supply before handling LCD module.
- 11.4.2. Do not pull or fold the LED cable.
- 11.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in or to prevent electric shock.

11.5 Absolute Maximum Ratings and Power Protection Circuit

- 11.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature etc., otherwise LCD module may be damaged.
- 11.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- 11.5.3. It's recommended to employ protection circuit for power supply.

Operation

- 11.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.
- 11.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
- 11.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
- 11.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.
- 11.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

11.7 Mechanism

Please mount LCD module by using mounting holes arranged in four corners tightly.

11.8 Static Electricity

11.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

11.8.2 Because LCD module use CMOS-IC on circuit board and TFT LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should be grounded through adequate methods.

11.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

11.10 Disposal

When disposing LCD module, obey the local environmental regulations.