# TFT DISPLAY SPECIFICATION




## WINSTAR Display Co.,Ltd.
## 華凌光電股份有限公司

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**Winstar Display Co., LTD**
**華凌光電股份有限公司**

# SPECIFICATION

**CUSTOMER :** _____

**MODULE NO.:** WF57-320240A3D#004-FC

| | |
|---|---|
| **APPROVED BY:**<br>**( FOR CUSTOMER USE ONLY )** | **PCB VERSION:** **DATA:** |

| SALES BY | APPROVED BY | CHECKED BY | PREPARED BY |
|---|---|---|---|
| | | | 葉虹蘭 |
| **ISSUED DATE:** 2023/02/03 | | | |

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# General Specifications

| Item | Dimension | Unit |
|---|---|---|
| Size | 5.7 | inch |
| Dot Matrix | 320 x RGBx240(TFT) | dots |
| Module dimension | 141.12(W) x 101.55(H) x 6.05(D) | mm |
| Active area | 115.2 x 86.40 | mm |
| Dot pitch | 0.12 x 0.36 | mm |
| LCD type | TFT, Normally White, Transmissive | |
| TFT Driver IC | HX8218 +HX8615 or Equivalent | |
| TFT Interface | 24-bit RGB | |
| View Direction | 12 o'clock | |
| Gray Scale Inversion Direction | 6 o'clock | |
| Aspect Ratio | 4:3 | |
| Backlight Type | LED,Normally White | |
| With /Without TP | Without TP | |
| Surface | Glare | |

*Color tone slight changed by temperature and driving voltage.

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# Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Operating Temperature | TOP | -20 | — | +70 | ℃ |
| Storage Temperature | TST | -30 | — | +80 | ℃ |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. □60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

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# Electrical Characteristics

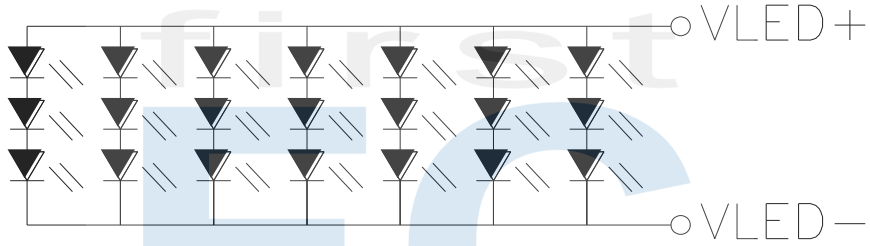
**Operating conditions**

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Supply Voltage For Logic | VCC | — | 3.0 | 3.3 | 3.6 | V |
| Supply Current | ICC | VCC=3.3V | — | 230 | 345 | mA |

**LED driving conditions**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|
| LED current | — | — | 140 | — | mA | — |
| Power Consumption | — | 1204 | — | 1470 | mW | — |
| LED voltage | VBL+ | 8.6 | — | 10.5 | V | Note 1 |
| LED Life Time | — | — | 50,000 | — | Hr | Note 2,3,4 |

Note 1 : There are 1 Groups LED




Backlight LED Circuit

Note 2 : Ta = 25 ℃

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case.

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# Optical Characteristics

| Item | | Symbol | Condition. | Min | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|---|---|
| Response time | | Tr+ Tf | θ=0°、Φ=0° | - | 25 | - | .ms | Note 3,5 |
| Contrast ratio | | CR | At optimized viewing angle | - | 300 | - | - | Note 4,5 |
| Color Chromaticity | White | Wx | θ=0°、Φ=0 | 0.267 | 0.317 | 0.367 | | Note 2,6,7 |
| | | Wy | | 0.303 | 0.353 | 0.403 | | |
| Viewing angle (Gray Scale Inversion Direction) | Hor. | ΘR | CR≧10 | - | 60 | - | Deg. | Note 1 |
| | | ΘL | | - | 60 | - | | |
| | Ver. | ΦT | | - | 70 | - | | |
| | | ΦB | | - | 70 | - | | |
| Brightness | | - | - | 800 | 900 | | cd/m$^2$ | Center of display |
| Uniformity | | (U) | - | 75 | - | - | % | Note 5 |

Ta=25±2℃, IL=140mA

Note 1: Definition of viewing angle range

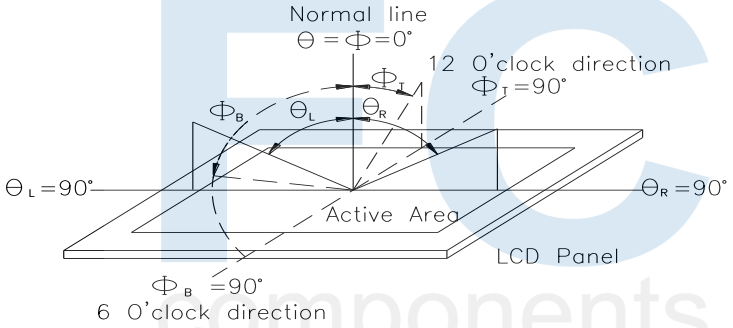



Fig.8.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

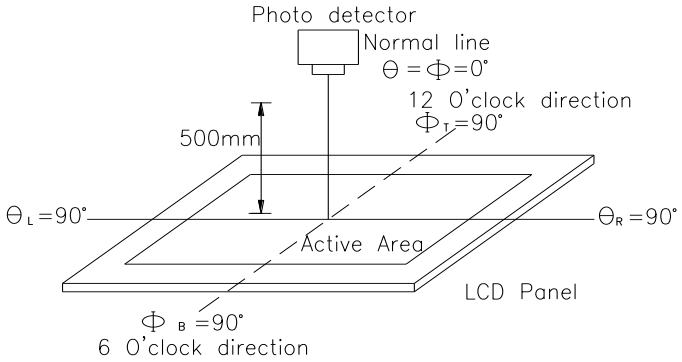



Fig. 8.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time, Tr, is the time between photo detector output intensity changed

# Interface

**LCM PIN Definition**

| Pin | Symbol | Function | Remark |
|---|---|---|---|
| 1 | NC | No connection | |
| 2 | NC | No connection | |
| 3 | GND | System ground pin of the IC. Connect to system ground. | |
| 4 | VCC | Power Supply | |
| 5 | R0 | Red Data bit(LSB) | |
| 6 | R1 | Red Data bit | |
| 7 | R2 | Red Data bit | |
| 8 | R3 | Red Data bit | |
| 9 | R4 | Red Data bit | |
| 10 | R5 | Red Data bit | |
| 11 | R6 | Red Data bit | |
| 12 | R7 | Red Data bit (MSB) | |
| 13 | G0 | Green Data bit(LSB) | |
| 14 | G1 | Green Data bit | |
| 15 | G2 | Green Data bit | |
| 16 | G3 | Green Data bit | |
| 17 | G4 | Green Data bit | |
| 18 | G5 | Green Data bit | |
| 19 | G6 | Green Data bit | |
| 20 | G7 | Green Data bit (MSB) | |
| 21 | B0 | Blue Data bit(LSB) | |
| 22 | B1 | Blue Data bit | |
| 23 | B2 | Blue Data bit | |
| 24 | B3 | Blue Data bit | |
| 25 | B4 | Blue Data bit | |
| 26 | B5 | Blue Data bit | |
| 27 | B6 | Blue Data bit | |
| 28 | B7 | Blue Data bit (MSB) | |
| 29 | GND | System ground pin of the IC. Connect to system ground. | |
| 30 | CLK | Dot data clock | |
| 31 | R/L | Shift direction of device internal shift register control. | Note2,3 |

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| | | | |
|---|---|---|---|
| 32 | Hsync | Horizontal sync signal | Note1 |
| 33 | Vsync | Vertical sync signal | Note1 |
| 34 | DE | Data Enable signal | Note1 |
| 35 | U/D | Up/down selection | Note2,3 |
| 36 | RESET | Hardware reset | |
| 37-40 | NC | No connection | |

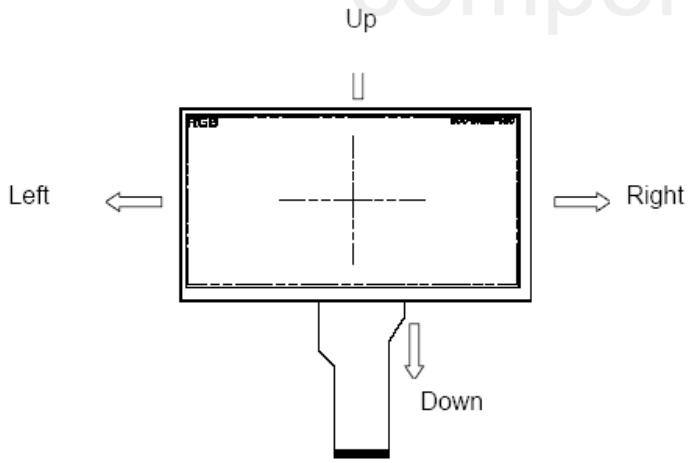
For digital 24Bit RGB input data format, both SYNC mode and DE mode are supported. If DE signal is fixed low, SYNC mode is used. Otherwise,DE mode is used. Suggest used SYNC mode!!

| Mode | D[23:16] | D[15:8] | D[7:0] | IHS | IVS | DEN |
|---|---|---|---|---|---|---|
| 24 bit RGB | R[7:0] | G[7:0] | B[7:0] | HSYNC | VSYNC | DE signal is fixed low for SYNC mode |
| | | | | Floating if not used | Floating if not used | DE for DE Mode |

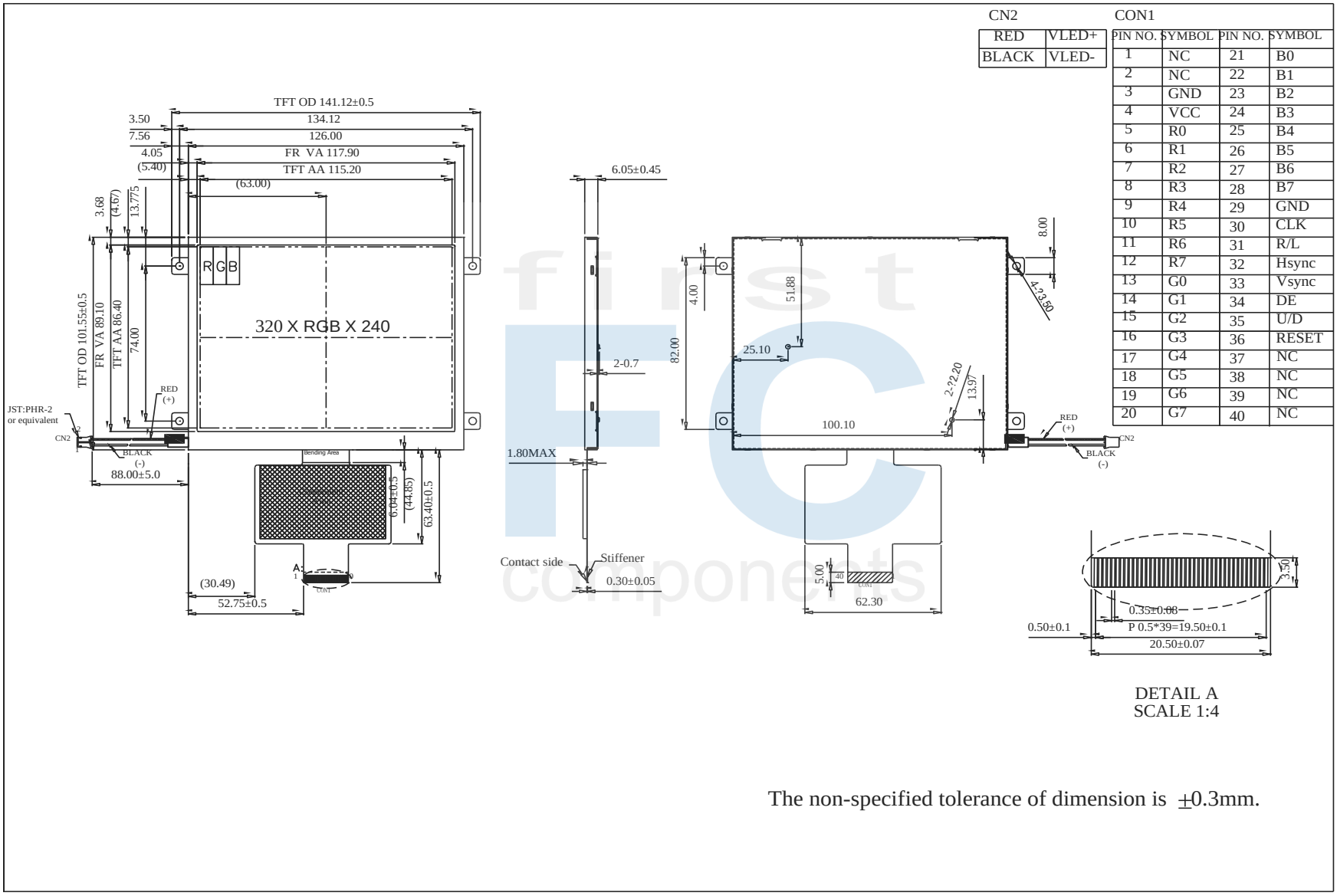
Note 2: Selection of scanning mode

| Setting of scan control input | | Scanning direction |
|---|---|---|
| U/D | R/L | |
| GND | VCC | Up to down, left to right |
| VCC | GND | Down to up, right to left |
| GND | GND | Up to down, right to left |
| VCC | VCC | Down to up, left to right |

Note 3: Definition of scanning direction. Refer to the figure as below:



# Contour Drawing




The non-specified tolerance of dimension is ±0.3mm.