# TFT DISPLAY SPECIFICATION




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## WINSTAR Display Co.,Ltd.
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# SPECIFICATION

**CUSTOMER :** _____

**MODULE NO.:** WF0128-240240BD#0P19B-FC

**with Knob**

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

| SALES BY | APPROVED BY | CHECKED BY | PREPARED BY |
|---|---|---|---|
| | | | |
| **ISSUED DATE:** 2023/03/31 | | | |

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| RECORDS OF REVISION | | | DOC. FIRST ISSUE |
|---|---|---|---|
| VERSION | DATE | REVISED PAGE NO. | SUMMARY |
| 0 | 2023/03/31 | | First issue |

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# General Specifications

| Item | Dimension | Unit |
|---|---|---|
| Size | 1.28 | inch |
| Dot Matrix | 240 x RGB x 240 (TFT) | dots |
| Module dimension | 56.0 x 56.0 x 25.8 | mm |
| Active area | 32.40 x 32.40 | mm |
| Dot pitch | 0.043 X 0.135 | mm |
| LCD type | TFT, Normally Black, Transmissive | |
| Viewing Angle | 80/80/80/80 | |
| TFT Interface | SPI | |
| Backlight Type | LED ,Normally White | |
| Driver IC | GC9A01 | |
| CTP Driver IC | CTS816 or equivalent | |
| CTP FW Version | 0X1 | |
| CTP Resolution | 240*240 | |
| With /Without TP | With CTP | |
| 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

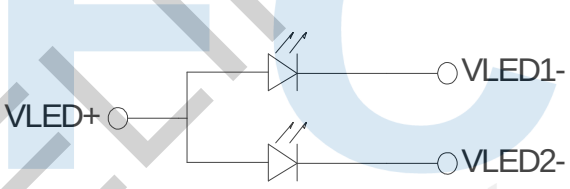
**Operating conditions**

| Item | Symbol | Conditions | Standard Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| Power Supply Voltage for Analog | VCI | Ta= +25℃ | 2.65 | 2.8 | 3.3 | V |
| Supply CTP | TP_VDD3.3 | Ta= +25℃ | 2.65 | 2.8 | 3.3 | V |
| | $I_{CTP}$ | Ta= +25℃ | - | 3.0 | 4.5 | mA |
| Input High Voltage for LCD | VIH | - | 0.8Iovcc | - | Iovcc | V |
| Input Low Voltage for LCD | VIL | - | Vss | - | 0.2 Iovcc | V |
| Output High Voltage for LCD | VOH | - | 0.8Iovcc | - | Iovcc | V |
| Output Low Voltage for LCD | VOL | - | Vss | - | 0.2 Iovcc | V |

**LED driving conditions**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|
| LED current | - | - | 40 | - | mA | - |
| LED voltage | VLED+ | 3.0 | 3.2 | 3.4 | V | Note 1 |
| LED Life Time | - | - | 20,000 | - | Hr | Note 2,3,4 |

Note 1 : There are 1 Groups LED




CIRCUIT DIAGRAM

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° | - | 30 | - | .ms | Note 3 |
| Contrast ratio | | CR | At optimized viewing angle | - | 1000 | - | - | Note 4 |
| Color Chromaticity | White | Wx | θ=0°、Φ=0 | 0.254 | 0.304 | 0.354 | - | Note 2,5,6 |
| | | Wy | | 0.277 | 0.327 | 0.377 | - | |
| Viewing angle (Gray Scale Inversion Direction) | Hor. | ΘR | CR≧10 | - | 80 | - | Deg. | Note 1 |
| | | ΘL | | - | 80 | - | | |
| | Ver. | ΦT | | - | 80 | - | | |
| | | ΦB | | - | 80 | - | | |
| Brightness | | - | - | 290 | 320 | - | cd/m2 | Center of display |
| Uniformity | | (U) | - | 75 | - | - | % | Note 5 |

Ta=25±2℃,

Note 1: Definition of viewing angle range

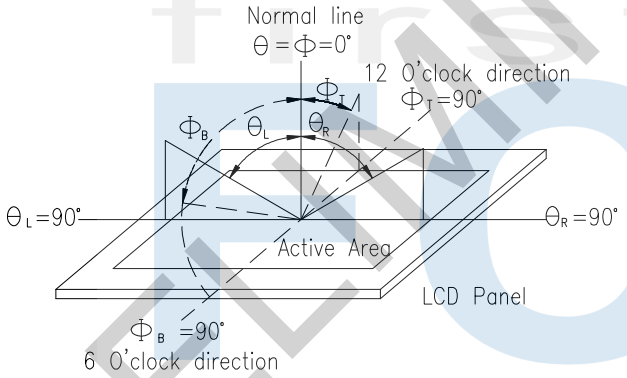
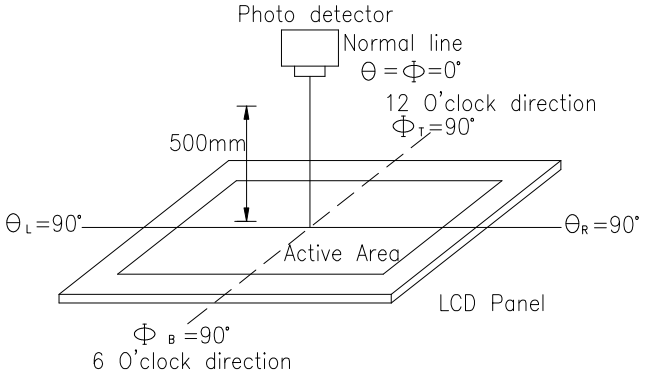



Fig. 5.1. Definition of viewing angle

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.




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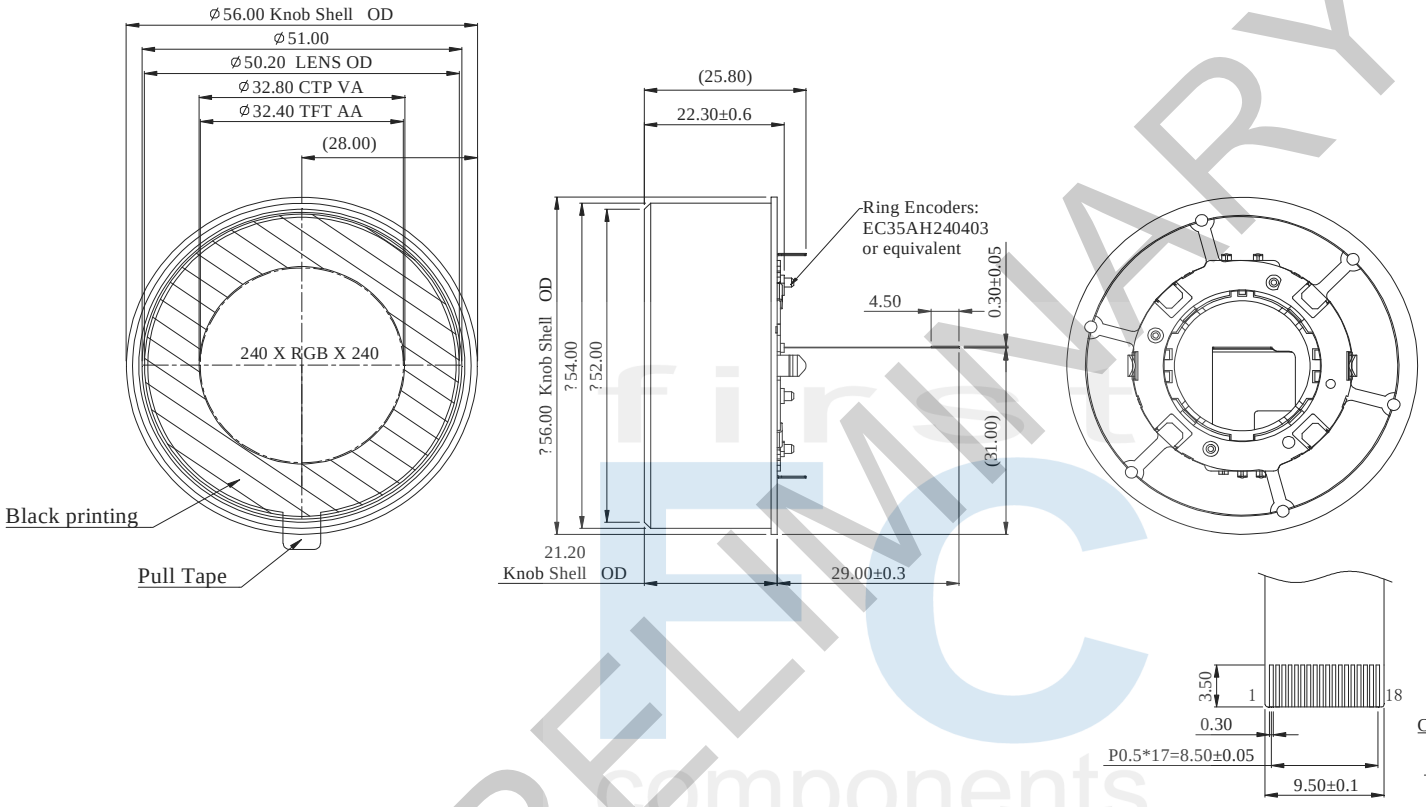
# Pin Interface

**LCM PIN Definition**

| Pin | Symbol | Function | Remark |
|---|---|---|---|
| 1 | TP_INT | INTERUPT SIGNAL | |
| 2 | TP_SDA | IIC DATA | |
| 3 | TP_SCL | IIC CLOCK | |
| 4 | TP_RESET | TP RESET SIGNAL | |
| 5 | TP_GND | Ground | |
| 6 | TP_VDD3.3V | CTP POWER SUPPLY | |
| 7 | VLED+ | Backlit positive | |
| 8 | VLED- | Backlit negative | |
| 9 | GND | Ground | |
| 10 | CS | Chip select signal | |
| 11 | SCL | Serial clock | |
| 12 | SDA | Serial data signal | |
| 13 | RS | Register select signal | |
| 14 | TE | TE signal | |
| 15 | RESET | LCD RESET Signal | |
| 16 | VCI3.3V | LCD Power supply | |
| 17 | NC | No connection | |
| 18 | GND | Ground | |

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# Contour Drawing




Detail "A"
SCALE 1/1

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

| PIN NO. | SYMBOL |
|---|---|
| 1 | TP_INT |
| 2 | TP_SDA |
| 3 | TP_SCL |
| 4 | TP_RESET |
| 5 | TP_GND |
| 6 | TP_VDD3.3V |
| 7 | VLED+ |
| 8 | VLED- |
| 9 | GND |
| 10 | CS |
| 11 | SCL |
| 12 | SDA |
| 13 | RS |
| 14 | TE |
| 15 | RESET |
| 16 | VCI3.3V |
| 17 | NC |
| 18 | GND |

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