TFT DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.

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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF0200-240320BD#0SP3-FC

APPROVED BY: (FOR CUSTOMER USE ONLY)	PCB VERSION: DATA:

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
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ISSUED DATE: 2025/02/04			

General Specifications

Item	Dimension	Unit
Size	2.0”	inch
Dot Matrix	240 x RGB x 320(TFT)	dots
Module dimension	38.4(W) x 51.9(H) x3.98(D)	mm
Active area	30.60 x 40.80	mm
Pixel Pitch	0.1275 x 0.1275	mm
LCD type	TFT, Normally Black, Transmissive	
TFT Interface	MCU / SPI	
TFT Driver IC	ST7789VI or Equivalent	
Viewing angle	80/80/80/80	
Aspect Ratio	3：4	
Backlight Type	LED,Normally White	
CTP Driver IC	GT911 or equivalent	
CTP Interface	I2C	
CTP FW	92	
CTP Resolution	240 * 320	
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

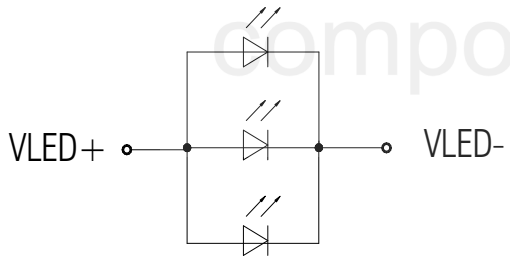
Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Analog	V_{DD}	–	2.4	3.3	3.6	V
Interface Operation Voltage	V_{DDI}	–	1.65	1.8	3.6	V
Supply Current For LCM	I_{DD}	$V_{DD} = V_{DDI}$ = V_{CC}=3.0V	–	6.0	9.0	mA
Supply CTP	VDDT	–	2.8	3.3	3.5	V
	I_{CTP}	–	–	8.0	12.0	mA

Note: to avoid power supply noise, please avoid using driving conditions close to min, or max value

LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	–	–	60	–	mA	–
LED voltage	VLED+	5.5	6.0	6.5	V	Note 1
LED Life Time	–	–	50,000	–	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



Back Light Circuit

Note 2 : Ta = 25 ℃
Note 3 : Brightness to be decreased to 50% of the initial value
Note 4 : The single LED lamp case

Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr+ Tf	θ=0°、Φ=0°	-	35	45	ms	Note 3
Contrast ratio		CR	At optimized viewing angle	640	800	-	-	Note 4
Color Chromaticity	White	Wx	θ=0°、Φ=0	0.246	0.296	0.346		Note 2,6,7
		Wy		0.275	0.325	0.375		
Viewing angle (Gray Scale Inversion Direction)	Hor.	ΘR	CR≧10	-	80	-	Deg.	Note 1
		ΘL		-	80	-		
	Ver.	ΦT		-	80	-		
		ΦB		-	80	-		
Brightness		-	-	650	750	-	cd/m2	Center of display
Uniformity		(U)	-	75	-	-	%	Note5

Ta=25±2℃

Note 1: Definition of viewing angle range

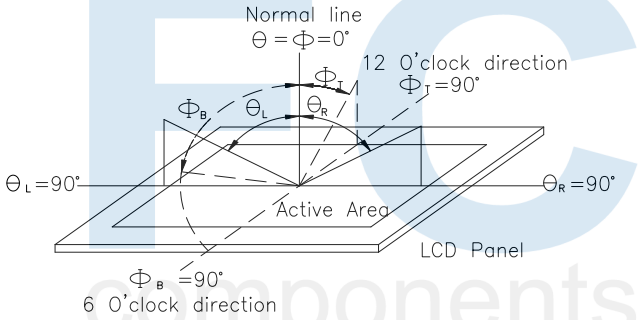


Fig. 8.1. Definition of viewing angle

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-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

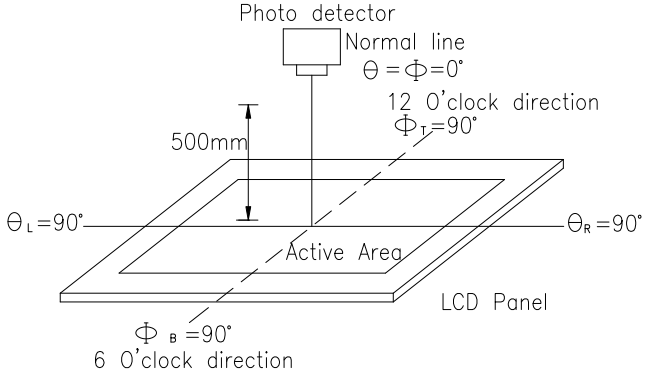


Fig. 8.2. Optical measurement system setup

Interface

LCM PIN Definition

<table>
<tr><th>NO</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>GND</td><td>Ground</td></tr>
<tr><td>2</td><td>NC(YU)</td><td>No connection</td></tr>
<tr><td>3</td><td>NC(XL)</td><td>No connection</td></tr>
<tr><td>4</td><td>NC(YD)</td><td>No connection</td></tr>
<tr><td>5</td><td>NC(XR)</td><td>No connection</td></tr>
<tr><td>6</td><td>NC</td><td>No connection</td></tr>
<tr><td>7</td><td>VDD</td><td>Power supply</td></tr>
<tr><td>8</td><td>VDDI</td><td>Power Supply for I/O System.</td></tr>
<tr><td>9</td><td>TE</td><td>Tearing effect signal is used to synchronize MCU to frame memory writing.
If not used, please let this pin open</td></tr>
<tr><td>10</td><td>CSX</td><td>Chip selection pin
Low enable.
High disable.</td></tr>
<tr><td>11</td><td>DCX(SCL)</td><td>(D/CX): This pin is used to select “Data or Command” in the parallel interface.
DCX=’1’: display data or parameter.
DCX=’0’: command data.
(SCL): When SPI mode,This pin is used to be serial interface clock.</td></tr>
<tr><td>12</td><td>WRX(D/CX)</td><td>Display data/command selection
Second Data lane in 2 data lane serial interface.
(WRX): Write enable in MCU parallel interface.
(D/CX): When 4-SPI mode,This pin in 4-line serial interface
If not used, please fix this pin at VDDI or GND.</td></tr>
<tr><td>13</td><td>RDX</td><td>-Read enable in 8080 MCU parallel interface.
-If not used, please fix this pin at VDDI or GND.</td></tr>
<tr><td>14~29</td><td>DB0~DB15</td><td>Data bus line</td></tr>
<tr><td>30</td><td>RESX</td><td>System reset pin.
signal is active low</td></tr>
<tr><td>31</td><td>IM0</td><td rowspan="3">The MCU interface mode select.
<table>
<tr><th>IM2</th><th>IM1</th><th>IM0</th><th>MPU Interface Mode</th><th>Data pin</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>80-8bit parallel I/F</td><td>DB[7:0]</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>80-16bit parallel I/F</td><td>DB[15:0]</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>80-9bit parallel I/F</td><td>DB[8:0]</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>80-18bit parallel I/F</td><td>DB[17:0],</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>3-line 9bit serial I/F</td><td>SDA: in/out</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>4-line 8bit serial I/F</td><td>SDA: in/out</td></tr>
</table>
</td></tr>
<tr><td>32</td><td>IM1</td></tr>
<tr><td>33</td><td>IM2</td></tr>
<tr><td>34~35</td><td>DB16~DB17</td><td>Data bus line</td></tr>
</table>

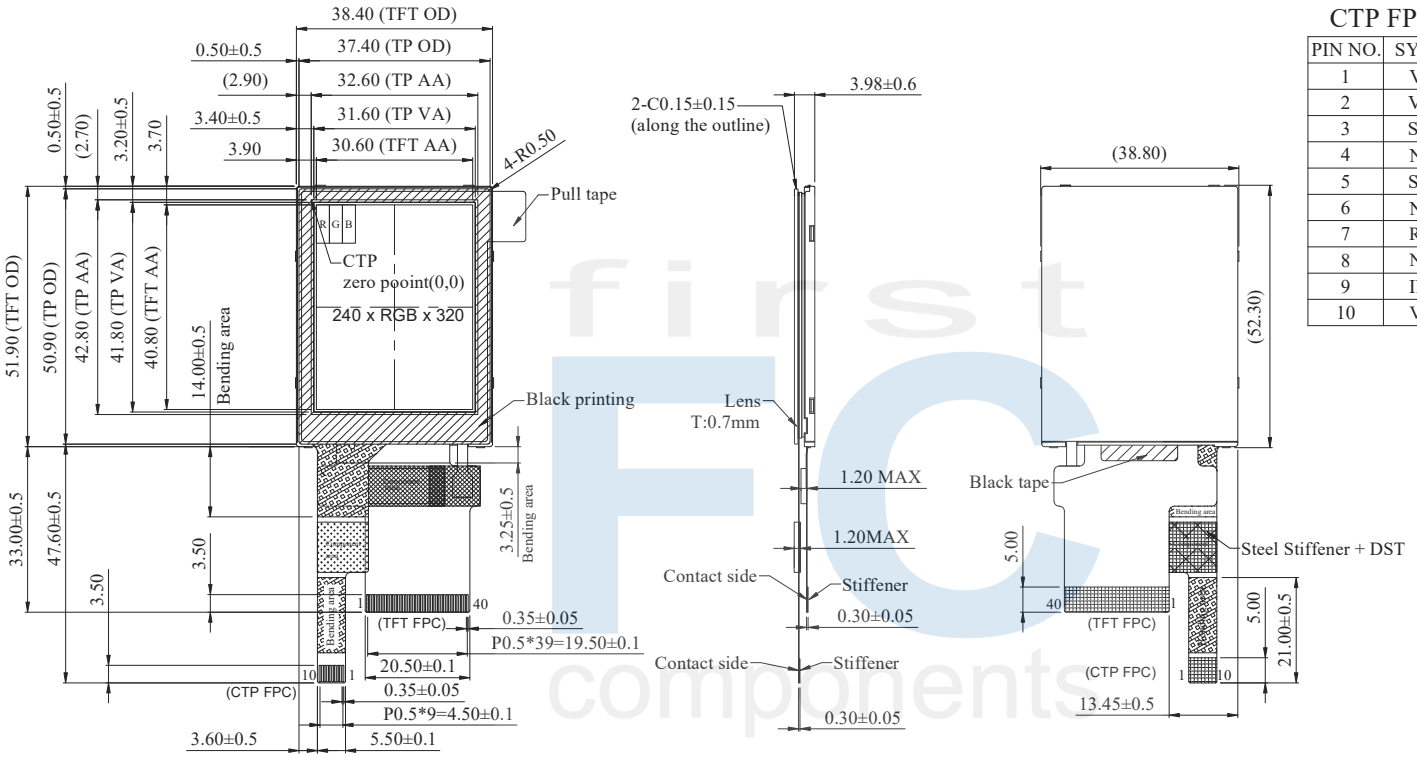
36	VLED-	Cathode of LED backlight.
37	VLED-	Cathode of LED backlight.
38	VLED+	Anode of LED backlight.
39	NC(SDA)	When SPI mode, This pin is SPI interface input/output pin. The data is latched on the rising edge of the SCL signal. If not used(NC), please fix this pin at VDDI or GND level.
40	NC	No connection

9.2. CTP PIN Definition

Pin	Symbol	Function	Remark
1	VSS	Ground for analog circuit	
2	VDDT	Power Supply :	
3	SCL	I2C clock inputI2C clock input	
4	NC	No connect	
5	SDA	I2C data input and output	
6	NC	No connect	
7	/RST	External Reset, Low is active	
8	NC	No connect	
9	/INT	External interrupt to the host	
10	VSS	Ground for analog circuit	

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Contour Drawing



CTP FPC

PIN NO.	SYMBOL
1	VSS
2	VDDT
3	SCL
4	NC
5	SDA
6	NC
7	RST
8	NC
9	INT
10	VSS

TFT FPC

PIN NO.	SYMBOL
1	GND
2	NC(YU)
3	NC(XL)
4	NC(YD)
5	NC(XR)
6	NC
7	VDD
8	VDDI
9	TE
10	CSX
11	D/CX(SCL)
12	WRX(D/CX)
13	RDX
14~29	DB0~DB15
30	RESX
31	IM0
32	IM1
33	IM2
34	DB16
35	DB17
36	VLED-
37	VLED-
38	VLED+
39	NC(SDA)
40	NC

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