TFT DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

Represented by:

FIRST Components s.r.l.
www.first-components.com
technical@first-components.com
+39 0332 1888005

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF28-240320JD#0SP3B-FC

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
first FC components			
ISSUED DATE: 2024/12/04			

General Specifications

Item	Dimension	Unit
Size	2.8”	
Dot Matrix	240 x RGB x 320(TFT)	dots
Module dimension	52.0(W) x 69.2(H) x 6.3(D)	mm
Active area	43.2 x 57.6	mm
Pixel pitch	0.18 x 0.18	mm
LCD type	TFT, Normally Black, Transmissive	
TFT Driver IC	ILI9341V or equivalent	
TFT Interface	MCU/SPI	
Viewing angle	80/80/80/80	
Aspect Ratio	3：4	
Backlight Type	LED,Normally White	
CTP Driver IC	CF1124 or equivalent	
CTP Interface	I2C	
CTP FW Version	01	
CTP Resolution	240*320	
With /Without TP	With CTP	
Surface	Glare	

*Color tone slight changed by temperature and driving voltage.

first components

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℃

first FC components

Electrical Characteristics

Operating conditions:

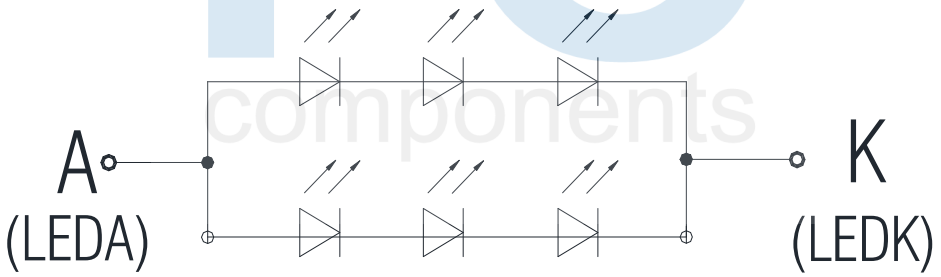
Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage for digital	IOVCC	—	1.65	—	3.3	V
Supply Voltage for analog	VCI	—	2.5	—	3.3	V
Power Supply for Current	ICC	IOVCC=VCI =VCC=3.0V	—	13	20	mA
Supply Voltage For Touch Logic	VDDT	—	3.0	3.3	3.6	V
	IDDT	—	—	15	25	mA

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	—	—	100	—	mA	—
LED voltage	LEDA	8.1	9.3	10.5	V	Note 1
LED Life Time	—	50000	—	—	Hr	Note 2,3

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°	-	30	40	ms	Note 3
Contrast ratio		CR	At optimized viewing angle	600	800	-	-	Note 4
Color Chromaticity	White	Wx	θ=0°、Φ=0	0.256	0.306	0.356		Note 2,6,7
		Wy		0.277	0.327	0.377		
Viewing angle	Hor.	ΘR	CR≧10	-	80	-	Deg.	Note 1
		ΘL		-	80	-		
	Ver.	ΦT		-	80	-		
		ΦB		-	80	-		
Brightness		-	-	700	800	-	cd/m2	Center of display
Uniformity		(U)	-	75	-	-	%	Note 5

Ta=25±2℃,ILED=100mA

Note 1: Definition of viewing angle range

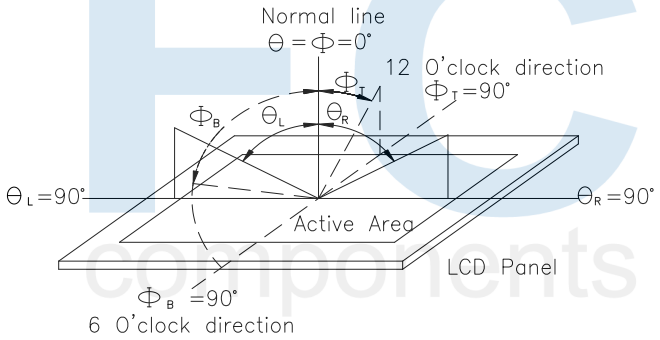


Fig. 9.1. Definition of viewing angle

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.

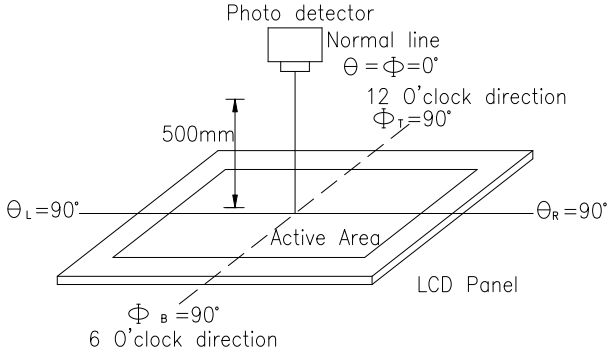


Fig. 9.2. Optical measurement system setup

Note 3: Definition of Response time:

Interface

LCM PIN Definition

NO	Symbol	Function	I/O
1	GND	Ground	P
2-6	NC	No connection	-
7	VCI	High voltage power supply for analog circuit blocks (2.5 ~ 3.3 V)	P
8	IOVCC	Low voltage power supply for interface logic circuits (2.5 ~ 3.3 V)	P
9	TE	Tearing effect output pin to synchronize MPU to frame writing, activated by S/W command. When this pin is not activated, this pin is low. If not used, open this pin.	O
10	CS	Chip select signal.	I
11	D/CX(SCL)	(D/CX): This pin is used to select “Data or Command” in the parallel interface. When DCX = 1, data is selected. When DCX = 0, command is selected. (SCL): This pin is used as the serial interface clock in 3-wire 9-bit/4-wire 8-bit serial data interface. If not used, this pin should be connected to IOVCC or GND.	I
12	WR(SPI_D/C)	(WRX) - 8080-Ⅰ/8080-Ⅱ system: Serves as a write signal and writes data at the rising edge. (D/CX) - 4-line system: Serves as the selector of command or parameter. Fix to IOVCC level when not in use.	I
13	RD	8080-Ⅰ/8080-Ⅱ system (RDX): Serves as a read signal and MCU read data at the rising edge. Fix to IOVCC level when not in use.	I
14-29	DB0~DB15	18-bit parallel bi-directional data bus for MCU system. Fix to GND level when not in use.	I/O
30	RESET	(RESX)This signal will reset the device and must be applied to properly initialize the chip. Signal is active low.	I
31	IM0	Select the MCU interface mode	I
32	IM1		
33	IM2		

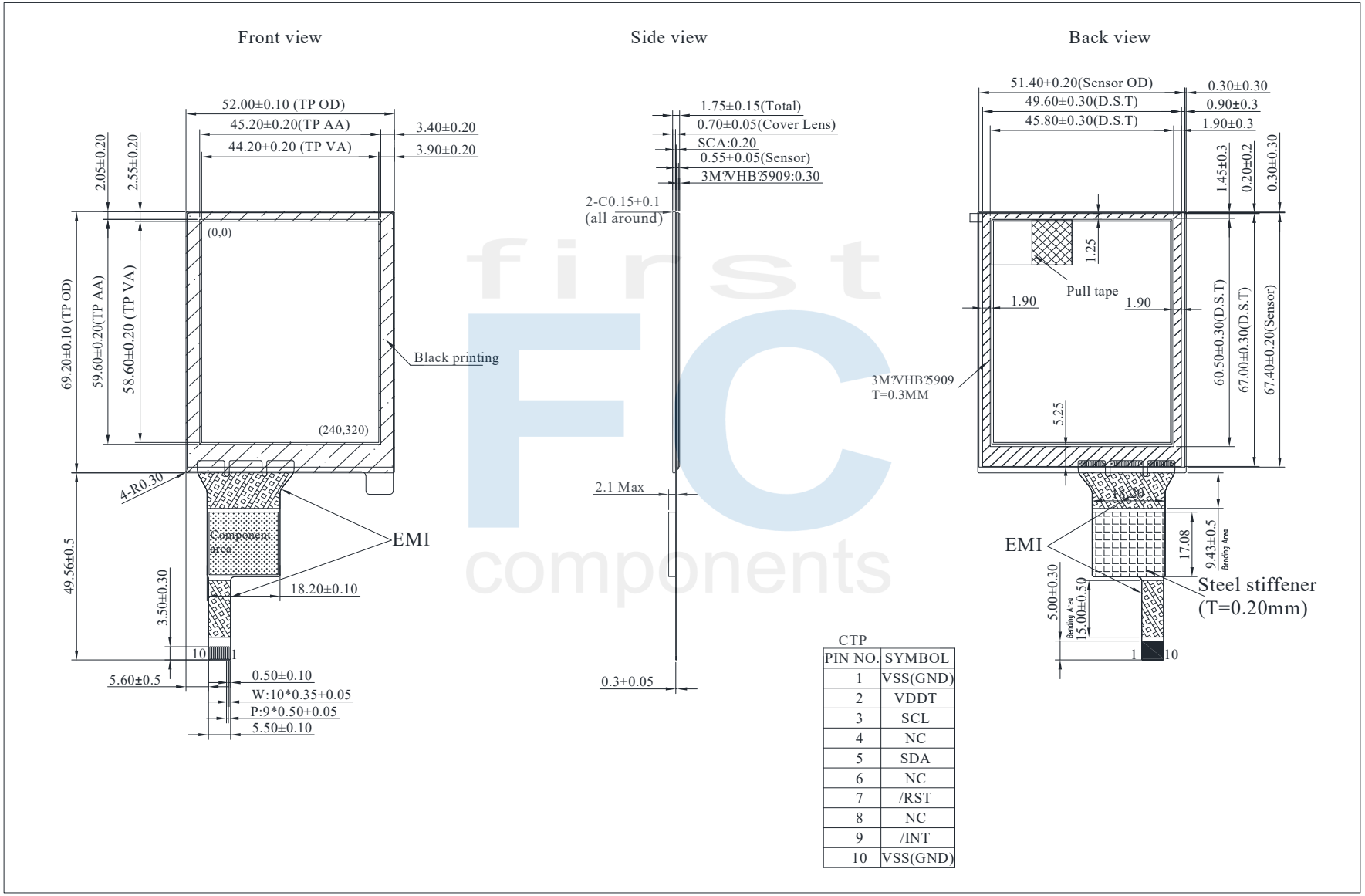
<table>
<tr><td></td><td></td><td>
<table>
<tr><th rowspan="2">IM2</th><th rowspan="2">IM1</th><th rowspan="2">IM0</th><th rowspan="2">MCU-Interface Mode</th><th colspan="2">DB Pin in use</th></tr>
<tr><th>Register/Content</th><th>GRAM</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>80 MCU 8-bit bus interface I</td><td>D[7:0]</td><td>D[7:0]</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>80 MCU 16-bit bus interface I</td><td>D[7:0]</td><td>D[15:0]</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>80 MCU 9-bit bus interface I</td><td>D[7:0]</td><td>D[8:0]</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>80 MCU 18-bit bus interface I</td><td>D[7:0]</td><td>D[17:0]</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>3-wire 9-bit data serial interface I</td><td colspan="2">SDA: In/OUT</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>4-wire 8-bit data serial interface I</td><td colspan="2">SDA: In/OUT</td></tr>
</table>
MPU Parallel interface bus and serial interface select
If use RGB Interface must select serial interface.
* : Fix this pin at IOVCC or GND.
</td><td></td></tr>
<tr><td>34</td><td>DB16</td><td rowspan="2">18-bit parallel bi-directional data bus for MCU system and RGB
interface mode
Fix to GND level when not in use.</td><td rowspan="2">I/O</td></tr>
<tr><td>35</td><td>DB17</td></tr>
<tr><td>36</td><td>LEDK</td><td>Cathode of LED backlight.</td><td>P</td></tr>
<tr><td>37</td><td>LEDK</td><td>Cathode of LED backlight.</td><td>P</td></tr>
<tr><td>38</td><td>LEDA</td><td>Anode of LED backlight.</td><td>P</td></tr>
<tr><td>39</td><td>SDA</td><td>SDA : Serial in/out signal.
The data is applied on the rising edge of the SCL signal.
If not used, fix this pin at IOVCC or GND.</td><td>I/O</td></tr>
<tr><td>40</td><td>NC</td><td>Not used, open this pin</td><td>N</td></tr>
</table>

CTP PIN Definition

Pin	Symbol	Function	Remark
1	VSS	Ground for analog circuit	
2	VDDT	Power Supply : +3.3V	
3	SCL	I2C 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	

first FC components

Touch Panel Information

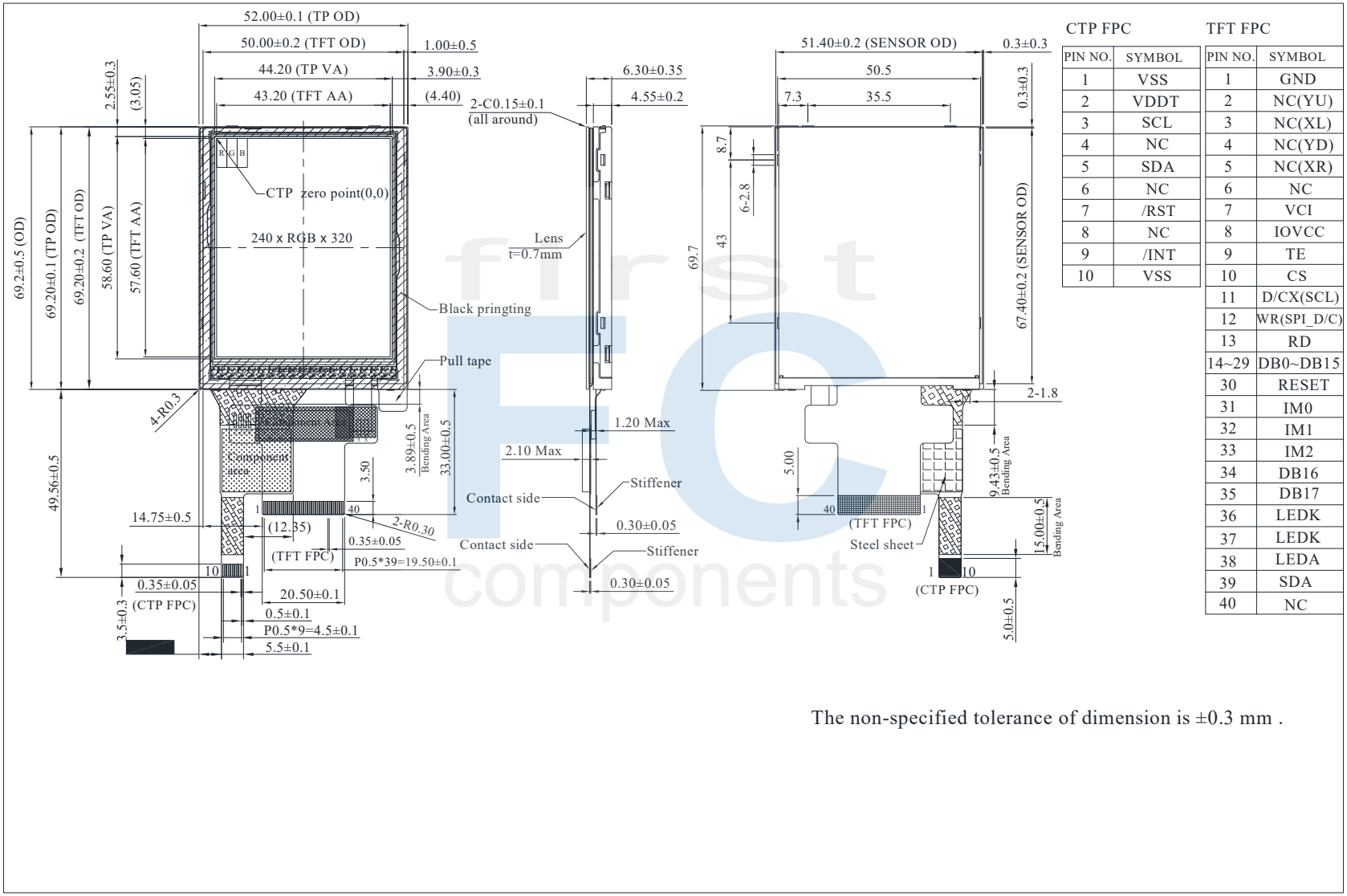


CTP

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

first FC components

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	VCI
8	IOVCC
9	TE
10	CS
11	D/CX(SCL)
12	WR(SPI_D/C)
13	RD
14~29	DB0~DB15
30	RESET
31	IM0
32	IM1
33	IM2
34	DB16
35	DB17
36	LEDK
37	LEDK
38	LEDA
39	SDA
40	NC

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

first components FC