TFT DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.

華凌光電股份有限公司

SPECIFICATION

MODULE NO.: WF28KTZAJDNG0#

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 3.93(D)	mm
Active area	43.2 x 57.6	mm
Pixel pitch	0.18 x 0.18	mm
LCD type	TFT, Normally White, Transmissive	
TFT Interface	SPI	
TFT Driver IC	ST7789V or Equivalent	
View Angle	75/75/75/75	
Aspect Ratio	Portrait	
Backlight Type	LED, Normally White	
PCAP Driver IC	CF1124 or equivalent	
PCAP Interface	I2C	
PCAP FW version	01	
PCAP Resolution	240*320	
Touch Panel	Projected capacitive touch panel (PCAP)	
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	℃

Electrical Characteristics

1. Operating conditions

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage For Analog	V_{CC}	2.4	3.3	3.6	V
Supply Current For LCM	I_{CC}	–	6.7	10.0	mA
Supply Voltage For Touch Logic	VDDT	3.0	3.3	3.6	V
	IDDT	–	15	25	mA

2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
LED current	–	–	80	–	mA
Power Consumption	–	232	256	272	mW
LED voltage	VLED+	2.9	3.2	3.4	V
LED Life Time	–	50,000	–	–	Hr

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Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	θ=0°、Φ=0°	-	4	8	ms	Note 3
		Tf		-	12	24	ms	
Contrast ratio		CR	At optimized viewing angle	400	500	-	-	Note 4
Color Chromaticity	White	Wx	θ=0°、Φ=0	0.253	0.303	0.353		Note 2,6,7
		Wy		0.275	0.325	0.375		
Viewing angle (Gray Scale Inversion Direction)	Hor.	ΘR	CR≧10	-	75	-	Deg.	Note 1
		ΘL		-	75	-		
	Ver.	ΦT		-	75	-		
		ΦB		-	75	-		
Brightness		-	-	250	350	-	cd/m2	Center of display
Uniformity		(U)	-	75	-	-	%	Note5

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Interface

1. 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>VLED+</td><td>Anode of LED backlight.</td></tr>
<tr><td>3</td><td>VLED-</td><td>Cathode of LED backlight.</td></tr>
<tr><td>4</td><td>GND</td><td>Ground</td></tr>
<tr><td>5</td><td>VCC</td><td>Power supply</td></tr>
<tr><td>6</td><td>RESET</td><td>System reset pin. (RESX)
signal is active low</td></tr>
<tr><td>7</td><td>SDA</td><td>When IM3: Low, SPI interface input/output pin.
When IM3: High, SPI interface input pin.
The data is latched on the rising edge of the SCL signal.
If not used, please fix this pin at VDDI or DGND level.</td></tr>
<tr><td>8</td><td>DCX(SCL)</td><td>This pin is used to be serial interface clock.
DCX=’1’: display data or parameter.
DCX=’0’: command data.
If not used, please fix this pin at VDDI or DGND.</td></tr>
<tr><td>9</td><td>CSX</td><td>Chip selection pin
Low enable.
High disable.</td></tr>
<tr><td>10</td><td>WRX(D/CX)</td><td>Display data/command selection pin in 4-line serial interface.
Second Data lane in 2 data lane serial interface.
If not used, please fix this pin at VDDI or DGND.</td></tr>
<tr><td>11</td><td>GND</td><td>Ground</td></tr>
<tr><td>12</td><td>SDO(DOUT)</td><td>SPI interface output pin.
The data is output on the falling edge of the SCL signal.
If not used, let this pin open.</td></tr>
<tr><td>13</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>14</td><td>IM3</td><td>The MCU interface mode select.
<table>
<tr><th>IM3</th><th>IM2</th><th>IM1</th><th>IM0</th><th>MPU Interface Mode</th><th>Data pin</th></tr>
<tr><td>0</td><td>1</td><td>1</td><td>0</td><td>4-line 8bit serial I/F</td><td>SDA: in/out</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>0</td><td>4-line 8bit serial I/F Ⅱ</td><td>SDA:in/
SDO: out</td></tr>
</table></td></tr>
<tr><td>15</td><td>GND</td><td>Ground</td></tr>
<tr><td>16-19</td><td>NC</td><td>No connect</td></tr>
<tr><td>20</td><td>GND</td><td>Ground</td></tr>
</table>

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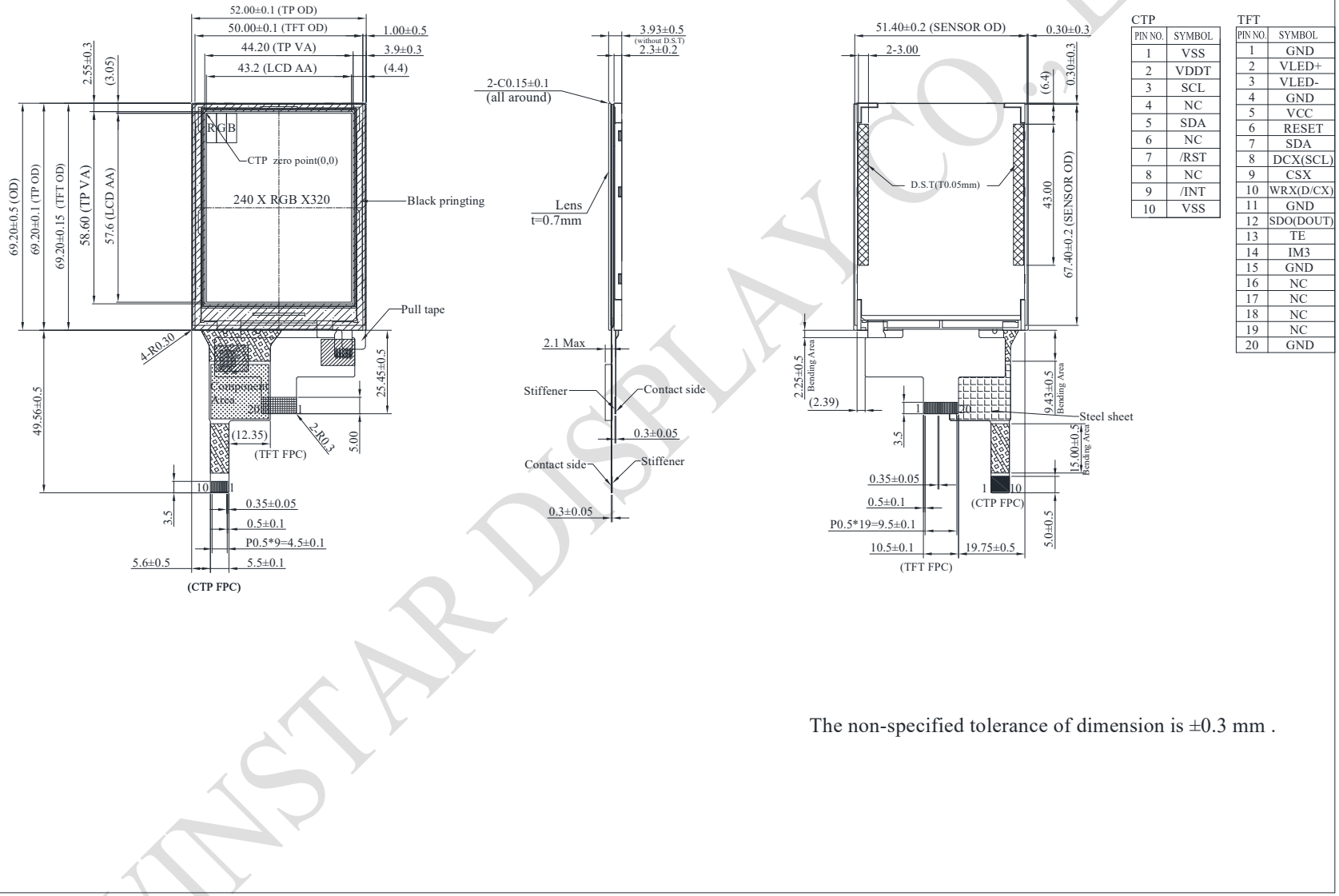
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2. PCAP PIN Definition

Pin	Symbol	Function
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

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Contour Drawing



CTP

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

TFT

PIN NO.	SYMBOL
1	GND
2	VLED+
3	VLED-
4	GND
5	VCC
6	RESET
7	SDA
8	DCX(SCL)
9	CSX
10	WRX(D/CX)
11	GND
12	SDO(DOUT)
13	TE
14	IM3
15	GND
16	NC
17	NC
18	NC
19	NC
20	GND

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

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