

# TFT DISPLAY SPECIFICATION



RAYSTAR

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## RFJ02000B-AYW-DNG1

### General Specifications

- Size: 2-inch
- Dot Matrix: 240 x RGB x 320 (TFT) dots
- Module Dimension: 38.8 (W) x 52.3 (H) x3.8 (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
- Viewing Angle: 80/80/80/80
- Aspect Ratio: 3 : 4
- Backlight Type: LED, Normally White
- PCAP Driver IC: GT911
- PCAP Interface: I2C
- PCAP FW: V92
- PCAP Resolution: 240 \* 320
- Touch Panel: Projected Capacitive Touch Screen, PCAP+Optical Bonding
- Surface: Glare

\*Color tone slight changed by temperature and driving voltage.

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# Interface

## LCM PIN Definition

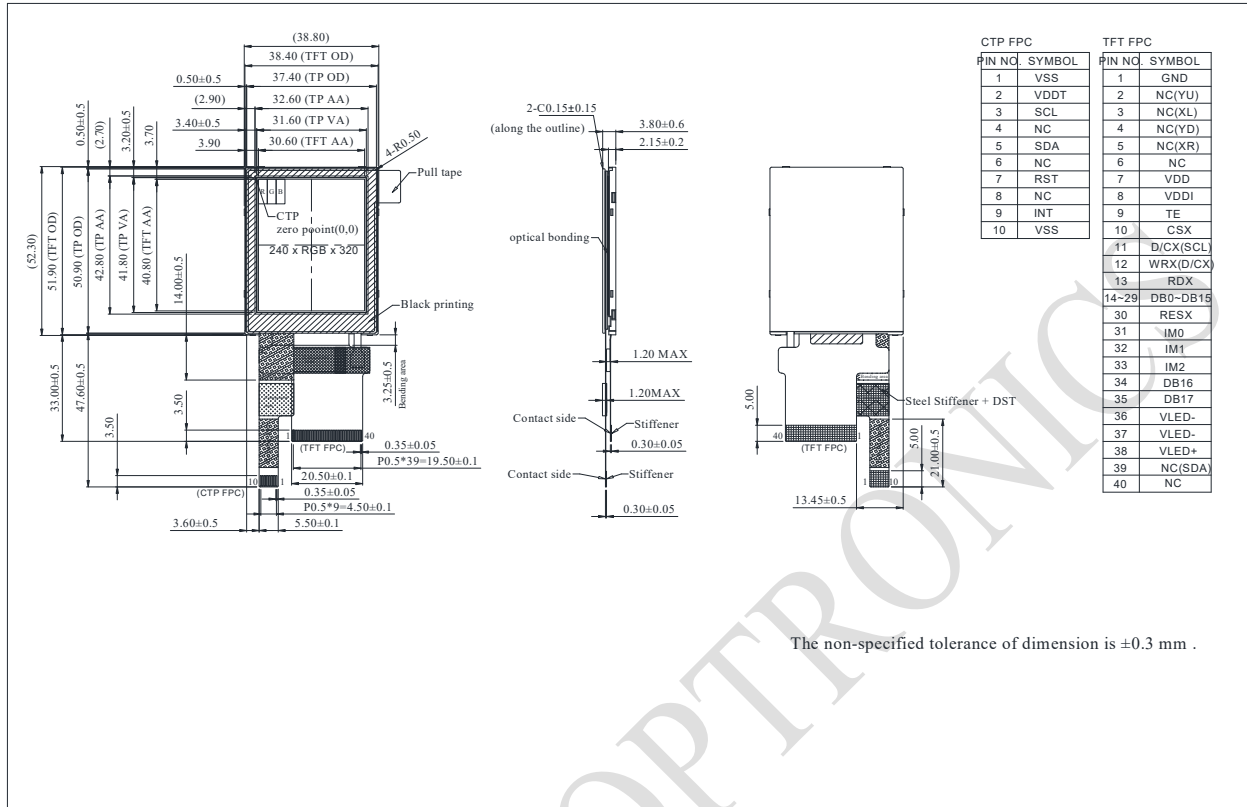
Pin No.	Symbol	Function
1	GND	Ground
2	NC(YU)	No connection
3	NC(XL)	No connection
4	NC(YD)	No connection
5	NC(XR)	No connection
6	NC	No connection
7	VDD	Power supply
8	VDDI	Power Supply for I/O System.
9	TE	Tearing effect signal is used to synchronize MCU to frame memory writing. If not used, please let this pin open
10	CSX	Chip selection pin Low enable. High disable.
11	DCX(SCL)	(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.
12	WRX(D/CX)	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.
13	RDX	-Read enable in 8080 MCU parallel interface. -If not used, please fix this pin at VDDI or GND.
14~29	DB0~DB15	Data bus line
30	RESX	System reset pin.

		signal is active low																																			
31	IM0	The MCU interface mode select.																																			
32	IM1	<table border="1"> <thead> <tr> <th>IM2</th> <th>IM1</th> <th>IM0</th> <th>MPU Interface Mode</th> <th>Data pin</th> </tr> </thead> <tbody> <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> </tbody> </table>	IM2	IM1	IM0	MPU Interface Mode	Data pin	0	0	0	80-8bit parallel I/F	DB[7:0]	0	0	1	80-16bit parallel I/F	DB[15:0]	0	1	0	80-9bit parallel I/F	DB[8:0]	0	1	1	80-18bit parallel I/F	DB[17:0],	1	0	1	3-line 9bit serial I/F	SDA: in/out	1	1	0	4-line 8bit serial I/F	SDA: in/out
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33	IM2																																				
34~35	DB16~DB17	Data bus line																																			
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																																			

### PCAP PIN Definition

Pin No.	Symbol	Function
1	VSS	Ground for analog circuit
2	VDDT	Power Supply :
3	SCL	I2C clock input 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

# Contour Drawing



CTP FPC		TFT FPC	
PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	VSS	1	GND
2	VDDT	2	NC(YU)
3	SCL	3	NC(XL)
4	NC	4	NC(YD)
5	SDA	5	NC(XR)
6	NC	6	NC
7	RST	7	VDD
8	NC	8	VDDI
9	INT	9	TE
10	VSS	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 .

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## Absolute Maximum Ratings

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

## Electrical Characteristics

### Operating Conditions

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Analog	V <sub>DD</sub>	—	2.4	3.3	3.6	V
Interface Operation Voltage	V <sub>DDI</sub>	—	1.65	1.8	3.6	V
Supply Current For LCM	I <sub>DD</sub>	V <sub>DD</sub> = V <sub>DDI</sub> = V <sub>CC</sub> =3.0V	—	6.0	9.0	mA
Supply PCAP	V <sub>CTP</sub>	—	2.8	—	3.3	V
	I <sub>CTP</sub>	—	—	8.0	12.0	mA

### LED Driving Conditions

Parameter	Symbol	Min	Typ	Max	Unit
LED Current	—	—	60	—	mA
LED Voltage	V <sub>LED+</sub>	2.7	3.1	3.4	V
LED Life Time	—	—	50,000	—	Hr