

2.4TFT模组规格书

Part NO. 产品型号	JMD2.4TFT-10P
SIZE 尺寸(英寸)	2.4
Customer 客户名称	
Customer Part NO. 客户型号	
Date 日期	2024.3.27

SCJ Approval
双创嘉确认

Designed by 设计	Checked by 审核	Approved by 确认
		周冬华

Customer Approval
客户确认

Designed by 核准	Checked by 审核	Approved by 确认
备注 Note	<input type="checkbox"/> Approve Specification Only	
	<input type="checkbox"/> Approve Specification and Sample	

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1. Introduction

1.1 Scope of application

This specification applies to the Negative type TFT transmissive dot matrix LCD module that is supplied by

This LCD module should be designed for mobile phone use. LCD specification: 6:00, Dots 240xRGBx320. As to basic specification of the driver IC, refer to the IC (ST7789T3) specification and datasheet.

This specification applies to the Negative type TFT transmissive dot matrix LCD module that is supplied by SHENZHEN SHENGJI PHOTOELECTRIC. CO., LTD.

1.2 Structure:

Double display structure:

TFT Module + FPC + BL

FULL 262k Color 2.4 inch TFT LCD size for main LCD;

One bare chip with gold bump (COG) TECH;

1.3 TFT features:

Structure: TFT PANNEL+IC+FPC;

Transmissive Type LCD

240 dot-source and 320 dot-gate outputs;

262k Color;

White LED back light;

1.4 Applications:

Mobile; phone; Mp4.

1.5 This module uses ROHS material

2. General Specification

No.	ITEM	Standard value	UNIT
1	LCD size	2.4	Inch
2	Number of Dots	240*(RGB)*320	Dots
3	Display Area	36.72(W)*48.96(H)	mm
4	Module Size(W*H*T)	42.72 (W)*60.96(H)*2.2(T)	mm
5	LCD Type	TFT Negative Transmissive	/
6	Driver element	a-Si TFT Active matrix	/
7	Pixel Arrangement	RGB Vertical Stripe	/
8	Pixel Pitch (W*H)	0.1992(W)*0.207(H)mm	um
9	Viewing Direction	12 0' clock	/
10	Driver IC	ST7789T3	/
11	Interface	SPI4	/
12	Back Light	White LED	
13	Touch Panel Type	/	
14	Approx. Weight	/	g

3. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	VDD	-0.3	4.6	V
Input voltage for logic	VIN	-0.3	4.6	V
Supply current (One LED)	ILED	/	30	mA
Operating temperature	TOP	-20	70	°C
Storage temperature	TST	-30	80	°C

4. Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Applicable terminal
Supply voltage for logic	VDD	2.4	2.75	3.3	V	Operating voltage
Interface Operation Voltage	VDDI	1.65	1.8	3.3	V	I/O Supply Voltage
Logic-Low Input Voltage	VIL	VSS	-	0.3VDDI	V	
Logic-High Input Voltage	VIH	0.7VDDI	-	VDDI	V	
Input leakage current	IIL	-0.1	-	0.1	μ A	
LED Forward voltage	Vf	2.8	3.0	3.3	V	--
Input backlight current	ILED	-	80	-	mA	--

5. Optical Characteristics

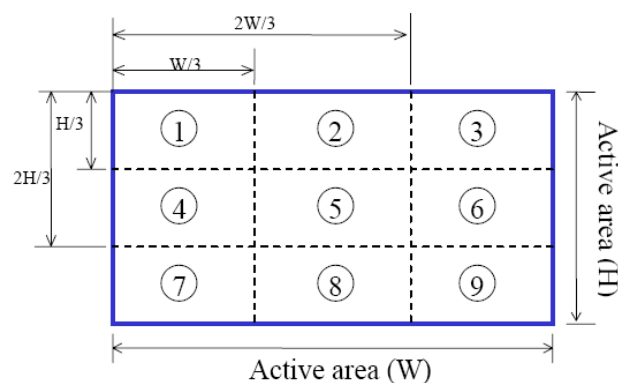
ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
			MIN.	TYP.	MAX		
Brightness	B		--	200	--	cd/m2	Note 1
Uniformity	Un		80	85		%	Note 2
Response Time(By Quick)	Tr+Tf	$\theta = 0^\circ$	-	25	40	ms	Note 5
Contrast Ratio	CR	$\theta = 0^\circ$	350	500	--	--	Note 4
Viewing Angle	Horizontal	$\theta 3$	CR \geq 10	40	45	Deg.	Note 3
		$\theta 9$	CR \geq 10	40	45		
	Vertical	$\theta 12$	CR \geq 10	45	50		
		$\theta 6$	CR \geq 10	15	20		
Color chromaticity (CF only with ITO, light source is C light, CIE 1931)	White	Wx	$\theta = 0^\circ$	0.284	0.299		Note 4
		Wy		0.318	0.333		
	Red	Rx		0.611	0.626		
		Ry		0.317	0.332		
	Green	Gx		0.267	0.282		
		Gy		0.574	0.589		
	Blue	Bx		0.122	0.137		
		By		0.134	0.149		
NTSC			55	60		%	Note 5

Note 1:Test condition is:

- (1) Center point on active area.
- (2)Best Contrast.

Note 2:Uniform measure condition:

- (1)Measure 9 point. Measure location show below;
- (2)Uniform=(Min. brightness /Max. brightness)*100%
- (3)Best Contrast.



Note:

3.Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing are determined for the horizontal or 3, 9 o' clock direction and the vertical or 6, 12 o' clock direction with respect to the optical axis which is normal to the LCD surface (see FIG. 2).

4.Contrast measurements shall be made at viewing angle of $\theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See FIG.2) Luminance Contrast Ratio (CR) is defined mathematically.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

5. The electro-optical response time measurements shall be made as FIG.3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_f and 90% to 10% is T_r.

Figure 1. The definition of V_{th} & V_{sat}

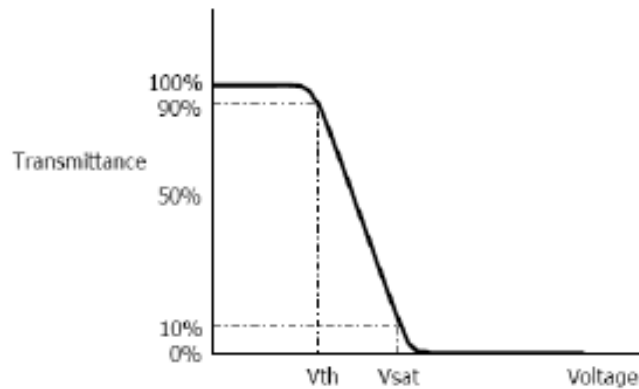


Figure 2. Measurement Set Up

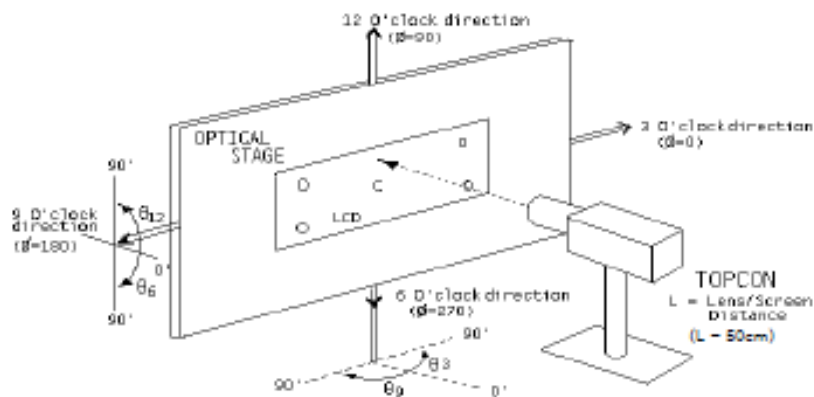
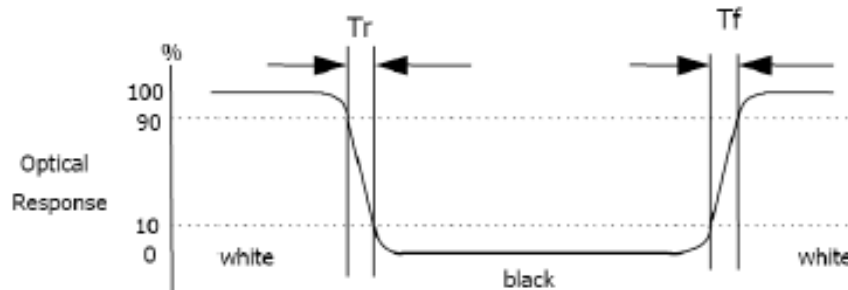


Figure 3. Response Time Testing



6. Power ON/OFF Sequence

VDDI and VDD can be applied in any order.

VDD and VDDI can be power down in any order.

During power off, if LCD is in the Sleep Out mode, VDD and VDDI must be powered down minimum 120msec after RESX has been released.

During power off, if LCD is in the Sleep In mode, VDDI or VDD can be powered down minimum 0msec after RESX has been released.

CSX can be applied at any timing or can be permanently grounded. RESX has priority over CSX.

Note 1: There will be no damage to the display module if the power sequences are not met.

Note 2: There will be no abnormal visible effects on the display panel during the Power On/Off Sequences.

Note 3: There will be no abnormal visible effects on the display between end of Power On Sequence and before receiving Sleep Out

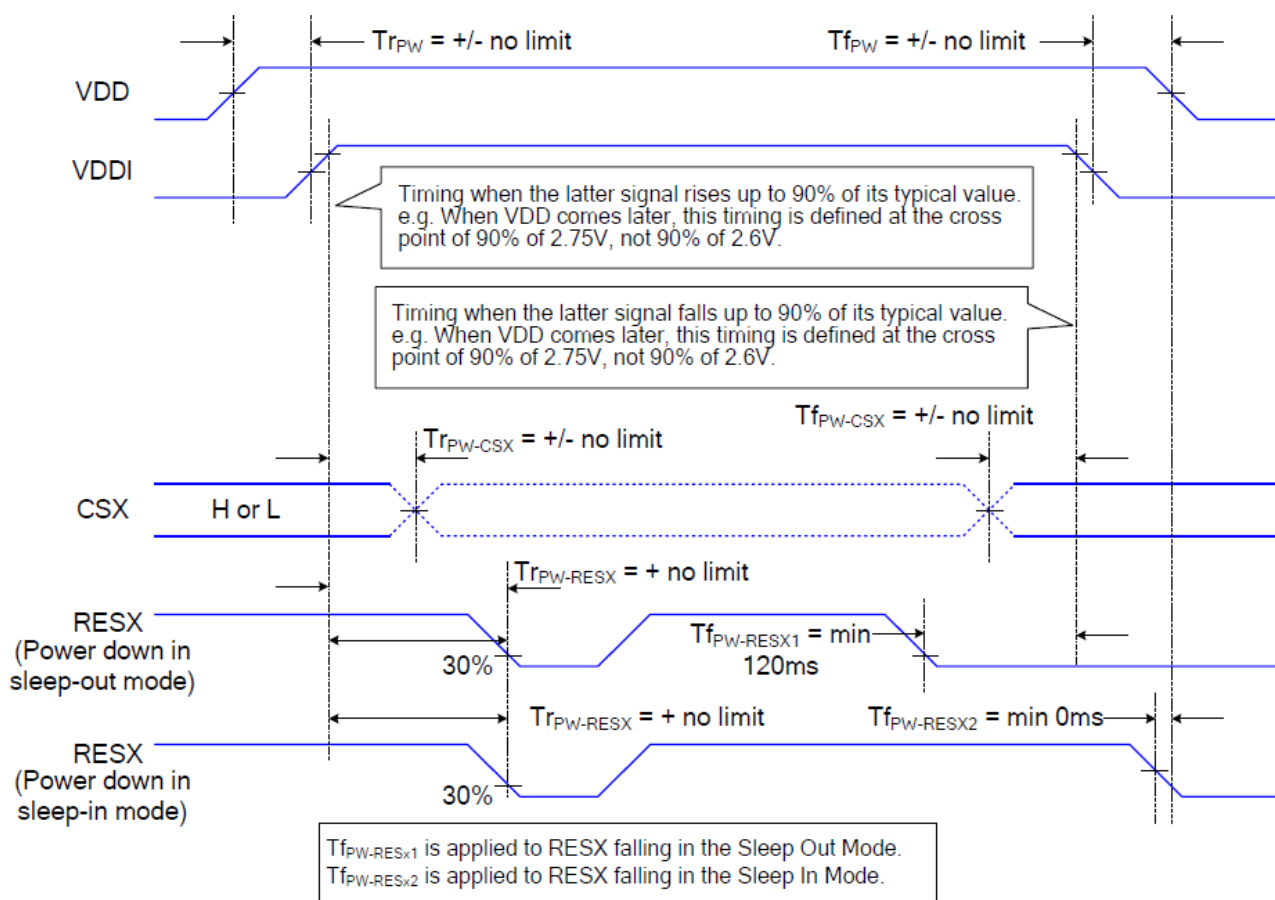
command. Also between receiving Sleep In command and Power Off Sequence.

Note 4: If RESX line is not held stable by host during Power On Sequence as defined in the sequence below, then it will be necessary to

apply a Hardware Reset (RESX) after Host Power On Sequence is complete to ensure correct operation. Otherwise function is not

guaranteed.

6.1 The power on/off sequence is illustrated below



6.2 Uncontrolled Power Off

The uncontrolled power-off means a situation which removed a battery without the controlled power off sequence. It will neither damage the module or the host interface.

If uncontrolled power-off happened, the display will go blank and there will not any visible effect on the display (blank display) and remains blank until “Power On Sequence” powers it up.

7. Serial Interface Characteristics (4-line serial):

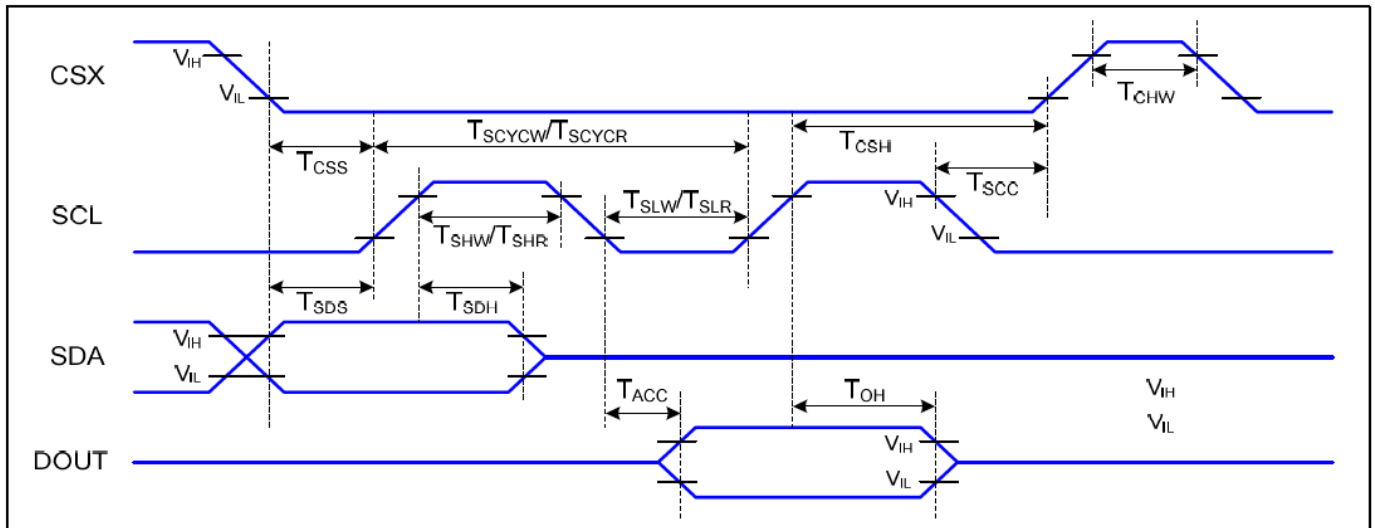


Figure 4 3-line serial Interface Timing Characteristics
VDDI=1.65 to 3.3V, VDD=2.4 to 3.3V, AGND=DGND=0V, Ta=-30 to 70 °C

Signal	Symbol	Parameter	Min	Max	Unit	Description
CSX	TCSS	Chip select setup time (write)	15		ns	
	TCSH	Chip select hold time (write)	15		ns	
	TCSS	Chip select setup time (read)	60		ns	
	TSCC	Chip select hold time (read)	65		ns	
	TCHW	Chip select “H” pulse width	40		ns	
SCL	TSCYCW	Serial clock cycle (Write)	66		ns	-write command & data ram
	TSHW	SCL “H” pulse width (Write)	15		ns	
	TSLW	SCL “L” pulse width (Write)	15		ns	
	TSCYCR	Serial clock cycle (Read)	150		ns	-read command & data ram
	TSHR	SCL “H” pulse width (Read)	60		ns	

9.Mechanical drawing

