

TFT LCD MODULE

2.4 inch 240RGB*320DOTS

Approved by

1. General Description

1.1 Description

this is a 240RGBX320 dot-matrix TFT LCD Panel, driver ICs, FPC and a Backlight unit.

TFT LCD module. This module is composed of a

1.2 Features

NO.	Item	Contents	Unit
1	LCD Size	2.4 inch(Diagonal)	-
2	Display Mode	Normally black	-
3	Resolution	240(H)RGB x 320(V)	-
4	Dot pitch	0.051(H) x 0.153(V) mm	-
5	Active area	36.72(H) x 48.96(V) mm	-
6	Module size	44.8(H) x 73.03(V) x3.41(D) mm	-
7	Color arrangement	RGB Vvertical stripe	-
8	Interface	MCU8 bit/SPI4	-
9	Drive IC	ST7789V	-
10	Luminance(cd/m2)	300 (TYP)	
11	Viewing Direction	ALL View	
12	Backlight	4White LED	
13	Operating Temp.	-20°C ~ + 70°C	°C
14	Storage Temp.	-30°C ~+ 80°C	°C
15	Weight	TBD	g

2. Mechanical Drawing

**2.4" IPS
240KRGBX320 DOTS
ALL DIRECTION**

CK-10-M010-04

接口支持: 4SP/8bit 接口

No.	SYMBOL
1	LED-A
2	LED-K
3	LED
4	MI
5	MI0
6	VDD-2.8
7	DET
8	DB5
9	DB5
10	DB4
11	DB3
12	DB2
13	DB1
14	DB0
15	ED
16	WR
17	RS
18	CS
19	TE
20	RST
21	SMA
22	CND

TP PIN NAME:

1	TP-SC1
2	TP-SDA
3	TP-TDD
4	TP-RST
5	TP-INT
6	TP-GND
7	NC
8	NC
9	NC
10	NC

NOTES:

- DISPLAY TYPE: 2.4" TFT
- VIEWING DIRECTION: ALL
- POLARIZER MODE: TRANSMISSIVE/NORMALLY BLACK
- DRIVER IC: S7789
- OPERATING TEMP.: -20° C~70° C
- STORAGE TEMP.: -30° C~80° C
- BACK LIGHT: 4 CHIP-WHITE LED: 80MA, 3.0V
- LCM Luminance: 400 CD/M2(TYP)
- UNMARKED TOLERANCE: ±0.2
- 建议封装于可视视区比 LCD A.A区单边大 0.3mm
- 产品符合RoHS标准

Customer Approval		Signature	
Laser Diversion Specified		Title	
Unit	mm		
General Roughness			
Tolerance	±0.3	By	Jesen
Dimension	±1	Date	20211028
Angle		Drawn	Jesen
		E.E.	
		Panel / E.	
		P.M.	
Scale	1:1	Sheet 1 of 1	
Size	A3	Sole time / Polytronic	
Working Number	2.4" TFT	Rev.	A
Material			

Item	Date	Remark
A	20211028	Original Drawing LCM

3. Pin Definition

FPC Connector is used for the module electronics interface.

Note:

Pin NO.	Symbol	Description
1	LEDA	B/L positive pin
2	LEDK	B/L negative pin
3	IM2	GND/VCC
4	IM1	GND/VCC
5	IM0	GND/VCC
6	VCC	Power supply, 2.8V typ
7-14	DB(7:0)	DATABUS
15	RD	read signal and read data at the low level.
16	WR	write signal and write data at the low level.
17	RS	select "Data or Command
18	CS	Chip select
19	TE	Tearing effect signal is used
20	RESET	This signal will reset the device and must be applied to properly initialize the chip
21	SDA	SPI interface input/output pin.the data is latched on the rising edge of the SCL signal.
22	GND	Power Ground

4. Electrical Characteristics

4.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage (I/O)	VDD	-0.3	4.6	V	
Analog Supply Voltage	VDDIO	-0.3	4.6	V	
Logic Input Voltage	VIN	-0.3	VDD+0.3	V	
Operation Temperature	Top	-20	70	°C	
Storage Temperature	Tst	-30	80	°C	

4.2 Operating Conditions

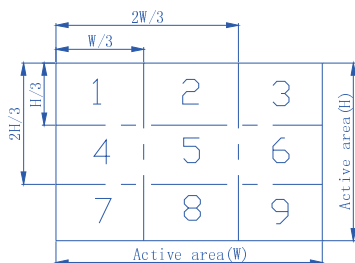
Parameter	Symbol	Min	TYP	MAX	Unit	Notes
Voltage for LED backlight	VLED	2.9	3.0	3.1	V	
System Voltage	VDD	2.4	2.8	3.3	V	
Interface Operation Voltage	VDDIO	1.65	1.8	3.3	V	
Gate Driver High Voltage	VGH	12.2	-	14.97	V	
Gate <i>Driver Low</i> Voltage	VGL	-12.5	-	-7.16	V	
Operating Current for V _{DD}	I _{DD}	-	8	10	mA	
Current for LED backlight	I _{LED}	60	-	80	mA	4LED
Brightness	L _{br}	260	300	-	cd/m ²	
Sleep_In Mode VDD	I _{dd}	-	15	30	uA	
Sleep_In Mode VDDIO	I _{ddio}	-	5	10	uA	

1 Test condition is:

- a:Center point on active area
- b:Best Contrast

2 Uniform measure condition:

- a:Measure 9 point,Measure location is show below:
- b:Uniform=(Min brightness/Max.brightness)x100%
- c:Best Contrast.



5. OPTICAL CHARACTERISTICS

Item	Symbol	Measuring Conditions		Min.	Typ.	Max.	Unit	Remark
		$\theta = 0^\circ$ $\phi = 0^\circ$	25 °C					
Response Time	Tr+Tf	$\theta = 0^\circ$ $\phi = 0^\circ$	25 °C	-	30	35	ms	
Viewing Angle	θ	$\phi = 0^\circ$	25 °C	-	80	-	Deg	Note (b)
		$\phi = 180^\circ$	25 °C	-	80	-		
	θ	$\phi = 90^\circ$	25 °C	-	80	-		
		$\phi = 270^\circ$	25 °C	-	80	-		
Contrast Ratio	CR	-	25 °C	1000	1500	-	-	Note (c)
Color of CIE Coordinate	White	X	25 °C	0.300	0.302	0.304	-	-
		Y	25 °C	0.323	0.325	0.327		
	Red	X	25 °C	0.622	0.624	0.626		
		Y	25 °C	0.327	0.329	0.331		
	Green	X	25 °C	0.286	0.288	0.290		
		Y	25 °C	0.520	0.522	0.524		
	Blue	X	25 °C	0.134	0.136	0.138		
		Y	25 °C	0.135	0.137	0.139		
Transmittance (with polarizer)	--	--	-	4.3	4.65	-	%	-

Note1: Definition of Response Time.(white-black)

The response time is defined as the time interval between the 10% and 90% amplitudes

6. Reliability

6.1 Contents of Reliability Tests

Item	Conditions	Criteria
High Temperature Operation	70°C, 120 hrs	The operational functions work.
Low Temperature Operation	-20°C, 120 hrs	
High Temperature Storage	80°C, 120 hrs	
Low Temperature Storage	-30°C, 120 hrs	
High Temperature/Humidity Operation	50°C, 85% RH, 120 hrs	
Temperature Cycling	-10°C ⇔ 25°C ⇔ 60°C ⇔ 25°C, 60mins/Cycle, 12 Cycles	

Note:

No moisture condensation is observed during tests.

Condition of image sticking test : 25°C±2°C.

6.2 Shock and Vibration

Test Item	Conditions
Packing Vibration	Frequency range 10~50HZ, Stroke: 1.0mm, sweep: 10~50Hz, X,y,z 2 hours for each direction

6.3 ESD

Test Item	Conditions
ESD	150pF , 330Ω , Contact: ±2KV,
	150pF , 330Ω , Air: ±4KV