

0.96" 80*160 IPS ST7735S 262K SPI Solder 13 Pin



- ST7735S is driven with 18 bit color depth.
 - Full Color: 262K, RGB=(666) Max., Idle Mode OFF
- LCD can display 262K Colors (6R:6G:6B)
- Color Reduce Mode 3 bit - 8 Color RGB
- Programmable Pixel Color Format (Color Depth) for Various Display Data input Format:
 - 18-bit/pixel: RGB=(666) Using the 384k-bit Frame Memory and LUT
- Software Programmable Color Depth Mode
- Partial Window Moving & Data Scrolling
- SPI Interface
 - 4-line Serial Interface
- Power Supply
 - VDD: 2.5V - 3.7V
- IPS, all view direction.
- Normally black.
- Solderable FPC Cable. No connector required.
- Brightness: 400 cd/m²



Ordering &
Details



Support &
Community



Technical
Documentation

1 General Specifications

1.1 Features

No.	Feature	Specifications	Unit
1	LCD Size	0.96 inch(Diagonal)	-
2	Display Mode	Normally black	-
3	Resolution	80(H)RGB x 160(V)	-
4	Dot pitch	0.135(H) x 0.1356(V)	mm
5	Active area	10.8(H) x 21.7(V)	mm
6	Module size	13.5(H) x 27.95(V) x 1.5Max(D)	mm
7	Color arrangement	RGB Vertical stripe	-
8	Interface	4 Line SPI	-
9	Driver IC	ST7735S	-
10	Luminance	400 (TYP)	(cd/m2)
11	Viewing Direction	All View	-
12	Backlight	1 White LED	-
13	Operating Temp.	-20°C~ + 70°C	-
14	Storage Temp.	-30°C~+ 80°C	-
15	Weight	1.1	g

2 Electrical Characteristics

2.1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage (I/O)	V_{DD}	-0.3	4.6	V
Operation Temperature	T_{opr}	-20	70	°C
Storage Temperature	T_{stg}	-30	80	°C

2.2 Driving TFT LCD Panel

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Voltage for LED backlight	V_{bL}	2.9	3.0	3.1	V	-
Supply Voltage	V_{DD}	2.5	2.8	3.7	V	
Gate Driver Voltage	V_{GH}	10	-	15	V	
	V_{GL}	-13	-	-75	V	
Operating Current for VDD	I_{DD}	-	2	3	mA	
Current for LED backlight	I_{BL}	15	-	20	mA	1 LED
Brightness	L_{BR}	350	400	-	cd/m2	
Sleep In Mode V_{DD}	I_{DD}	-	15	30	μA	

3 Mechanical Drawing

[illegible]

4 Pin Definition

Pin no.	Symbol	Description
1	NC	No connection.
2	NC	No connection.
3	SDA	SPI interface input/output pin.
4	SCK	SPI interface clock.
5	D/C	Display data/command selection pin in 4-line serial interface.
6	RESET	Reset signal. Active low.
7	CS	SPI chip select input pin. Active low.
8	GND	Power ground pin.
9	NC	No connection.
10	VDD	Power supply pin.
11	LEDK	Backlight LED cathode pin.
12	LEDA	Backlight LED anode pin.
13	GND	Power ground pin..

5 Optical Characteristics

Item	Symbol	Measuring Conditions		Min.	Typ.	Max.	Unit
Viewing Angle	θ_T	CR≥10	25°C	-	80	-	Degree
	θ_B			-	80	-	
	θ_L			-	80	-	
	θ_R			-	80	-	
Contrast Ratio	CR	-	25°C	-	800	-	-
Response Time	$T_{ON} + T_{OFF}$	$\theta=0^\circ$ $\Phi=0^\circ$	25°C	-	30	40	mS
Color of CIE Coordinate	White	X	25°C	0.304	0.306	0.308	-
		Y	25°C	0.325	0.327	0.329	
	Red	X	25°C	0.608	0.610	0.612	
		Y	25°C	0.331	0.333	0.335	
	Green	X	25°C	0.279	0.281	0.283	
		Y	25°C	0.531	0.533	0.535	
	Blue	X	25°C	0.144	0.146	0.148	
		Y	25°C	0.136	0.138	0.140	
Transmittance (with polarizer)	-	-	-	-	5.09	-	%

Notes:

1. Definition of Response Time.(white-black). The response time is defined as the time interval between the 10% and 90% amplitudes
2. Definition of Viewing Angle:
viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).
3. Definition of Contrast Ratio (CR): measured at the center point of panel

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminance measured when LCD is on the White state}}{\text{Luminance measured when LCD is on the Black state}}$$

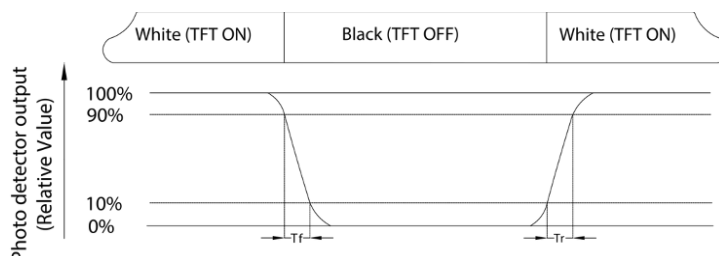
"White state ":The state is that the LCD should be driven by Vwhite.

"Black state": The state is that the LCD should be driven by Vblack.

Vwhite: To be determined Vblack: To be determined.

4. Definition of Response Time:

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



5. Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

6. Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity}(U) = \frac{L_{min}}{L_{max}}$$

L=Active area length W=Active area width

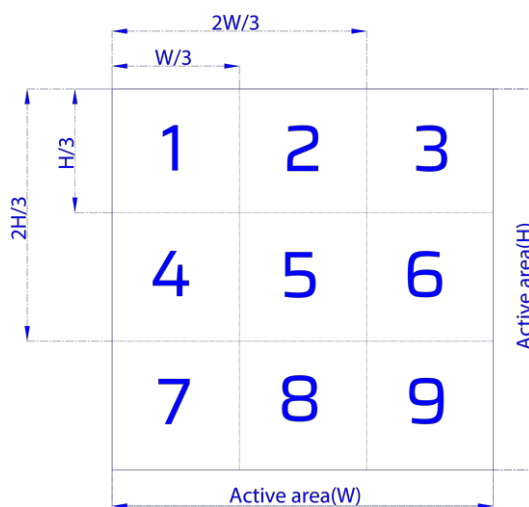


Figure 1: Definition of uniformity

L_{max} : The measured maximum luminance of all measurement position.

L_{min} : The measured minimum luminance of all measurement position.

7. Definition of Luminance:

Measure the luminance of white state at center point.

6 Environmental / Reliability Test

6.1 Contents of Reliability Tests

Item	Condition	Time (hrs)	Assessment
High temp. Storage	80°C	120	No abnormalities in functions and appearance
High temp. Operating	70°C	120	
Low temp. Storage	-30°C	120	
Low temp. Operating	-20°C	120	
Humidity	50°C / 85%RH	120	
Thermal Shock(Non-operation)	-10°C → 25°C → 60°C → 25°C 60mins/Cycle, 12 Cycles	10 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	Condition
High temp. Storage	Frequency range 10~50HZ, Stroke:1.0mm, sweep:10~50Hz, X, Y, Z 2 hours for each direction.

6.3 ESD

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

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7 Revision History

Revision	Details
1.0	Initial Release - 01.01.2023

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