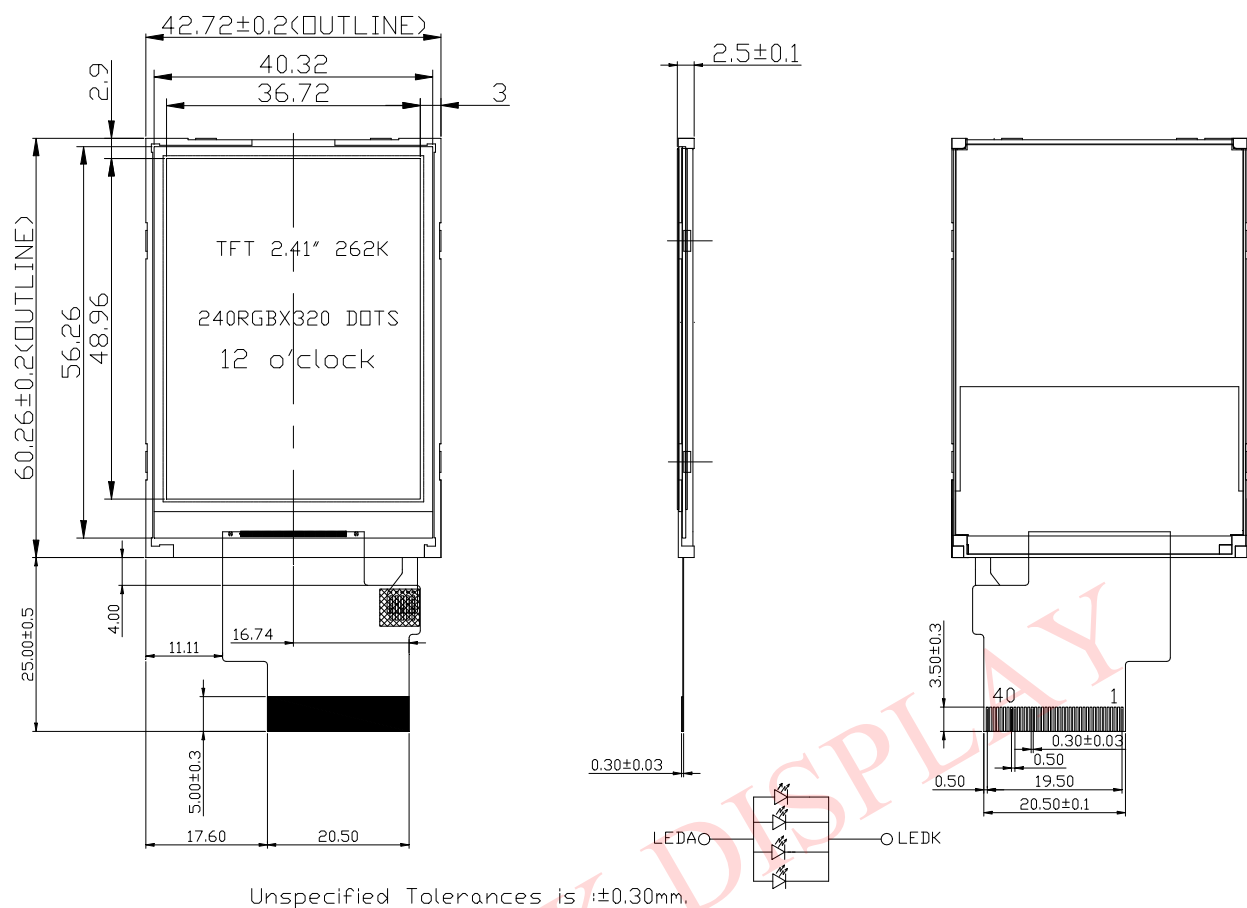




Unspecified Tolerances is $\pm 0.30\text{mm}$.

Pin Connections

MPU Interface Type: 8/16/9/18 bit parallel data bus for 8080 series

Pin	Symbol	I/O	Function																		
1	TE	-	Tearing effect signal is used to synchronize MCU to frame memory writing.. If not used, please let this pin open																		
2~19	DB17~DB0	H/L	DB[17:0] are used as MCU parallel interface data bus. If not used, please fix this pin at GND level.																		
20~24	V _{SS}	0V	Please fix this pin at GND level.																		
25	/RD	H/L	Read enable in 8080 MCU parallel interface.																		
26	/WR	H/L	Write enable in 8080 MCU parallel interface.																		
27	DC	H/L	Display data/command selection pin in parallel interface. DC='1': display data or parameter. DC='0': command data.																		
28	/CS	H/L	Chip selection pin : Low: enable. High :disable.																		
29	/REST	H/L	This signal will reset the device and it must be applied to properly initialize the chip. Signal is active low.																		
30	IM0	H/L	The MCU interface mode select.																		
31	IM1		<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>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>0</td><td>1</td><td>80-16bit parallel I/F</td><td>DB[15:0]</td></tr></table>	IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin	0	0	0	0	80-8bit parallel I/F	DB[7:0]	0	0	0	1	80-16bit parallel I/F	DB[15:0]
IM3	IM2		IM1	IM0	MPU Interface Mode	Data pin															
0	0		0	0	80-8bit parallel I/F	DB[7:0]															
0	0	0	1	80-16bit parallel I/F	DB[15:0]																
32	IM2																				
33	IM3																				

			0	0	1	0	80-9bit parallel I/F	DB[8:0]
			0	0	1	1	80-18bit parallel I/F	DB[17:0]
			1	0	0	0	80-16bit parallel I/F II	DB[17:10], DB[8:1]
			1	0	0	1	80-8bit parallel I/F II	DB[17:10]
			1	0	1	0	80-18bit parallel I/F II	DB[17:0]
			1	0	1	1	80-9bit parallel I/F II	DB[17:9]
34	V _{DD}	2.8V	Power supply for analog, Digital system and booster circuit.					
35	V _{DDI}	2.8V	Power supply for I/O system.					
36	V _{SS}	0V	Power ground					
37~38	NC	-	No connection					
39	LEDK	0V	Power supply for LED backlight cathode					
40	LEDA	3.1V	Power supply for LED backlight anode					

MPU Interface Type: serial interface(3-lines/9-bits or 4-lines/8-bits bi-directional interface)

Pin	Symbol	I/O	Function					
1	TE	-	Tearing effect signal is used to synchronize MCU to frame memory writing.. If not used, please let this pin open					
2~19	V _{SS}	0V	Please fix this pin at GND level.					
20	SDA	H/L	SPI interface input/output pin. The data is latched on the rising edge of the SCL signal. If not used, please fix this pin at GND level.					
21~25	V _{SS}	0V	Please fix this pin at GND level.					
26	RS	H/L	Display data/command selection pin in 4-line serial interface. If not used, please fix this pin at GND level.					
27	SCL	H/L	This pin is used to be serial interface clock.					
28	/CS	H/L	Chip selection pin Low enable. High disable.					
29	/REST	H/L	This signal will reset the device and it must be applied to properly initialize the chip. Signal is active low.					
30	IM0	H/L	When the SPI interface is selected, IM0 pin will be used for the ID setting.					
31	IM1		IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
32	IM2		0	1	0	1	3-line 9bit serial I/F	SDA: in/out
33	IM3		0	1	1	0	4-line 8bit serial I/F	SDA: in/out
34	V _{DD}	2.8V	Power supply for analog, Digital system and booster circuit.					
35	V _{DDI}	2.8V	Power supply for I/O system.					
36	V _{SS}	0V	Power ground					
37~38	NC	-	No connection					
39	LEDK	0V	Power supply for LED backlight cathode					
40	LEDA	3.1V	Power supply for LED backlight anode					

RGB Interface Type: DE mode and HV mode

Pin	Symbol	I/O	Function					
1	TE	-	Tearing effect signal is used to synchronize MCU to frame memory writing.. If not used, please let this pin open					
2~19	DB17~DB0	H/L	RGB Data bus.					
20	SDA	H/L	SPI interface input/output pin. The data is latched on the rising edge of the SCL signal.					
21	DOTCLK	H/L	Dot clock signal for RGB interface operation.					
22	ENABLE	H/L	Data enable signal for RGB interface operation. If not used, please fix this pin at GND.					
23	HSYNC	H/L	Horizontal (Line) synchronizing input signal for RGB interface operation.					

24	VSYNC	H/L	Vertical (Frame) synchronizing input signal for RGB interface operation.																			
25~26	V _{SS}	0V	Please fix this pin at GND level.																			
27	SCL	H/L	This pin is used to be serial interface clock.																			
28	/CS	H/L	Chip selection pin Low enable. High disable.																			
29	/REST	H/L	This signal will reset the device and it must be applied to properly initialize the chip. Signal is active low.																			
30	IM0	H/L	When using RGB interface, only serial interface can be selected.																			
31	IM1		<table><tr><td>IM3</td><td>IM2</td><td>IM1</td><td>IM0</td><td colspan="2">MPU Interface Mode</td><td>Data pin</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td><td colspan="2">3-line 9bit serial I/F</td><td>SDA: in/out</td></tr></table>						IM3	IM2	IM1	IM0	MPU Interface Mode		Data pin	0	1	0	1	3-line 9bit serial I/F		SDA: in/out
IM3	IM2		IM1	IM0	MPU Interface Mode		Data pin															
0	1		0	1	3-line 9bit serial I/F		SDA: in/out															
32	IM2																					
33	IM3																					
34	V _{DD}	2.8V	Power supply for analog, Digital system and booster circuit.																			
35	V _{DDI}	2.8V	Power supply for I/O system.																			
36	V _{SS}	0V	Power ground																			
37~38	NC	-	No connection																			
39	LEDK	0V	Power supply for LED backlight cathode																			
40	LEDA	3.1V	Power supply for LED backlight anode																			

Note: Two kinds of RGB interface can select: DE mode and HV mode, and 6bit/18bit data format. When DE mode is selected and the VSYNC, HSYNC, DOTCLK, DE, DB[17:0] pins can be used; when HV mode is selected and the VSYNC, HSYNC, DOTCLK, DB[17:0] pins can be used.

Basic Specifications

Item	Specifications
Size	2.4 inch
Resolution	240 × 3(RGB) × 320
Color depth	262K/65K
Viewing direction	12 o'clock
Operation temperature	-20 °C ~70 °C
Storage temperature	-30 °C ~ 80 °C
Driver IC	ST7789V
Interface type	8/16/9/18 bit parallel data bus for 8080 series, serial interface(3-lines/9-bits or 4-lines/8-bits bi-directional interface), RGB interface.

DC Electrical Characteristics&Backlight Driving Conditions

Item	Symbol	Min.	Typ.	Max.	Unit
Power supply	V _{DD}	2.6	2.8	3.3	V
Power supply for I/O system	V _{DDI}	2.6	2.8	3.3	V
Supply current	I _{DD}	-	-	-	mA
Input signal voltage	V _{IH}	0.7 V _{DDI}	-	V _{DDI}	V
	V _{IL}	V _{SS}	-	0.3 V _{DDI}	V
Output signal voltage	V _{OH}	0.8 V _{DDI}	-	V _{DDI}	V
	V _{OL}	V _{SS}	-	0.2 V _{DDI}	V
Power supply for LED backlight	V _F	3.0	3.1	3.2	V
Current for LED backlight	I _F	-	60	-	mA
Operating life time for LED backlight	Ta=25°C and I _F =60mA	-	20000	-	Hrs

Optical Specifications

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
View angles	VERT	θT	40	50	-	Degree
		θB	50	60	-	
	HOR	θL	60	70	-	
		θR	60	70	-	
Contrast ratio	CR	$\theta=0^{\circ}$	400	500	700	-
Chromaticity	White	X	0.25	0.30	0.35	
		Y	0.25	0.30	0.35	
Luminance	L	$T_a=25^{\circ}\text{C}$ and $I_F=60\text{mA}$	-	250	-	cd/m^2

Note:

T:Top 12 o'clock; B:Bottom 6 o'clock; L:Left 9 o'clock; R:Right 3 o'clock