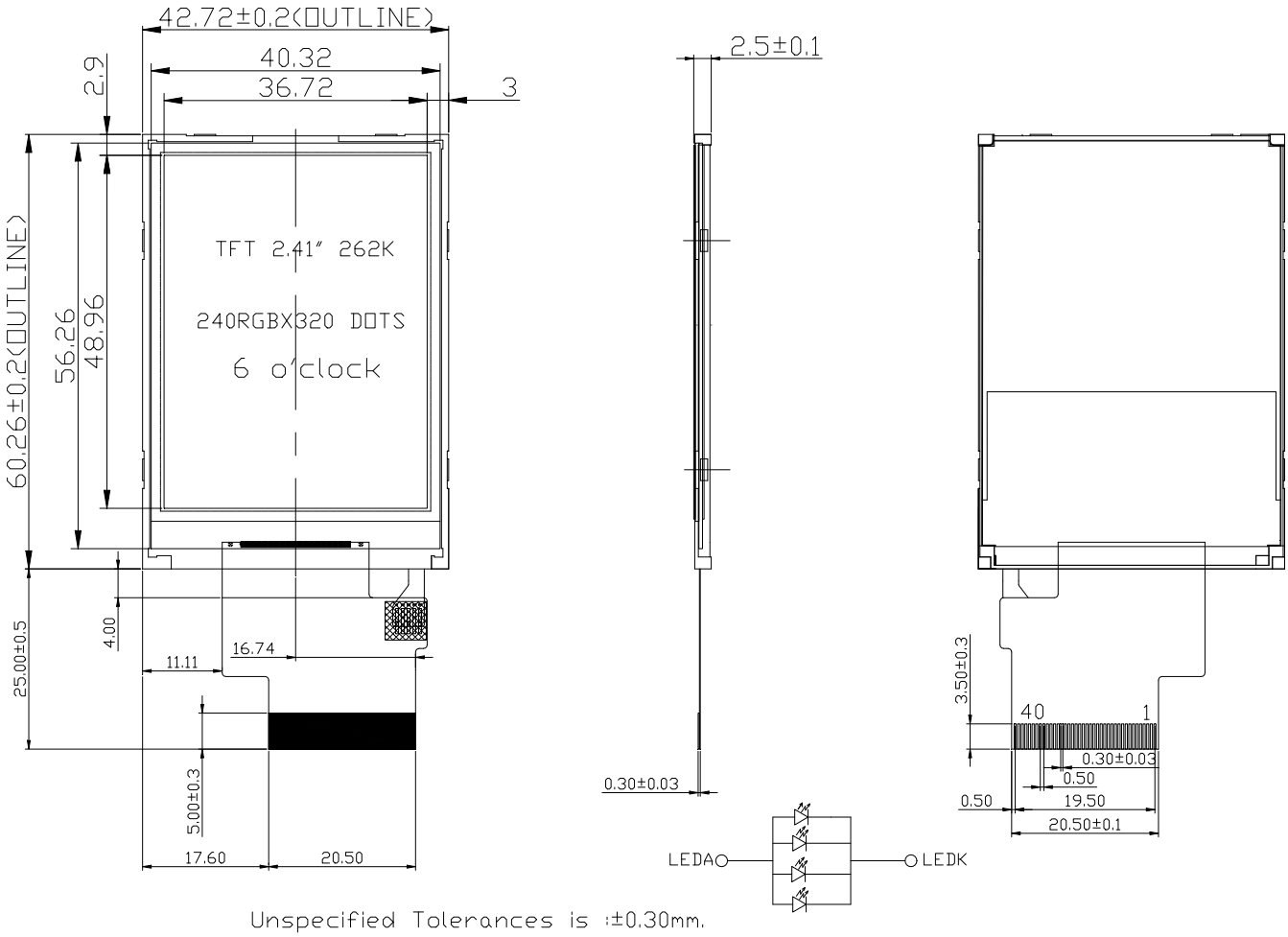

Pin Connections

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		
32	IM2		
33	IM3		

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]

			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		
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

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out

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.

<table>
<tr><td>24</td><td>VSYNC</td><td>H/L</td><td>Vertical (Frame) synchronizing input signal for RGB interface operation.</td></tr>
<tr><td>25~26</td><td>V_{SS}</td><td>0V</td><td>Please fix this pin at GND level.</td></tr>
<tr><td>27</td><td>SCL</td><td>H/L</td><td>This pin is used to be serial interface clock.</td></tr>
<tr><td>28</td><td>/CS</td><td>H/L</td><td>Chip selection pin Low enable. High disable.</td></tr>
<tr><td>29</td><td>/REST</td><td>H/L</td><td>This signal will reset the device and it must be applied to properly initialize the chip.
Signal is active low.</td></tr>
<tr><td>30</td><td>IM0</td><td rowspan="4">H/L</td><td rowspan="4">When using RGB interface, only serial interface can be selected.
<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>1</td><td>0</td><td>1</td><td>3-line 9bit serial I/F</td><td>SDA: in/out</td></tr></table></td></tr>
<tr><td>31</td><td>IM1</td></tr>
<tr><td>32</td><td>IM2</td></tr>
<tr><td>33</td><td>IM3</td></tr>
<tr><td>34</td><td>V_{DD}</td><td>2.8V</td><td>Power supply for analog, Digital system and booster circuit.</td></tr>
<tr><td>35</td><td>V_{DDI}</td><td>2.8V</td><td>Power supply for I/O system.</td></tr>
<tr><td>36</td><td>V_{SS}</td><td>0V</td><td>Power ground</td></tr>
<tr><td>37~38</td><td>NC</td><td>-</td><td>No connection</td></tr>
<tr><td>39</td><td>LEDK</td><td>0V</td><td>Power supply for LED backlight cathode</td></tr>
<tr><td>40</td><td>LEDA</td><td>3.1V</td><td>Power supply for LED backlight anode</td></tr>
</table>

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	6 o'clock
Operation temperature	-20 ℃ ~70 ℃
Storage temperature	-30 ℃ ~ 80 ℃
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℃and I_F =60mA	-	20000	-	Hrs

Optical Specifications

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
View angles	VERT	θT	CR≧10 (Note)	40	50	-	Degree
		θB		50	60	-	
	HOR	θL		60	70	-	
		θR		60	70	-	
Contrast ratio		CR	θ=0°	400	500	700	-
Chromaticity	White	X	Backlight is on	0.25	0.30	0.35	
		Y		0.25	0.30	0.35	
Luminance		L	Ta=25℃and I_F =60mA	-	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