LCD / LCM SPECIFICATION

WINSTAR Display Co.,Ltd.

華凌光電股份有限公司

SPECIFICATION

MODULE NO.: WO240128B-TMI#

General Specification

Item	Dimension	Unit
Number of dots	240 x 128	—
Module dimension	122.2 x 79.8 x 6.5	mm
View area	114.0 x 64.0	mm
Active area	107.98 x 57.58	mm
Dot size	0.43 x 0.43	mm
Dot pitch	0.45 x 0.45	mm
LCD type	STN Negative, Blue Transmissive (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Drive Method	1/128Duty，1/12Bias	
View direction	6 o'clock	
Backlight Type	LED, White	
IC	ST7586S	

Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	-20	—	+70	℃
Storage Temperature	T_{ST}	-30	—	+80	℃
Digital Power Supply Voltage	VDDI	-0.3	—	3.6	V
Analog Power supply voltage	VDDA	-0.3	—	3.6	V
LCD Power supply voltage	V0-XV0	-0.3	—	19	V
LCD Power supply voltage	VG	-0.3	—	5.5	V

Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	3.0	3.3	3.6	V
Supply Voltage For LCM	VOP	Ta=-20℃	—	—	—	V
		Ta=25℃	14.8	15.0	15.2	V
		Ta=+70℃	—	—	—	V
Input High Volt.	V_{IH}	—	0.7V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	Vss	—	0.3 V_{DD}	V
Output High Volt.	V_{OH}	—	0.8 V_{DD}	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	Vss	—	0.2V_{DD}	V
Supply Current	I_{DD}	V_{DD}=3.3V	—	2.0	4.0	mA

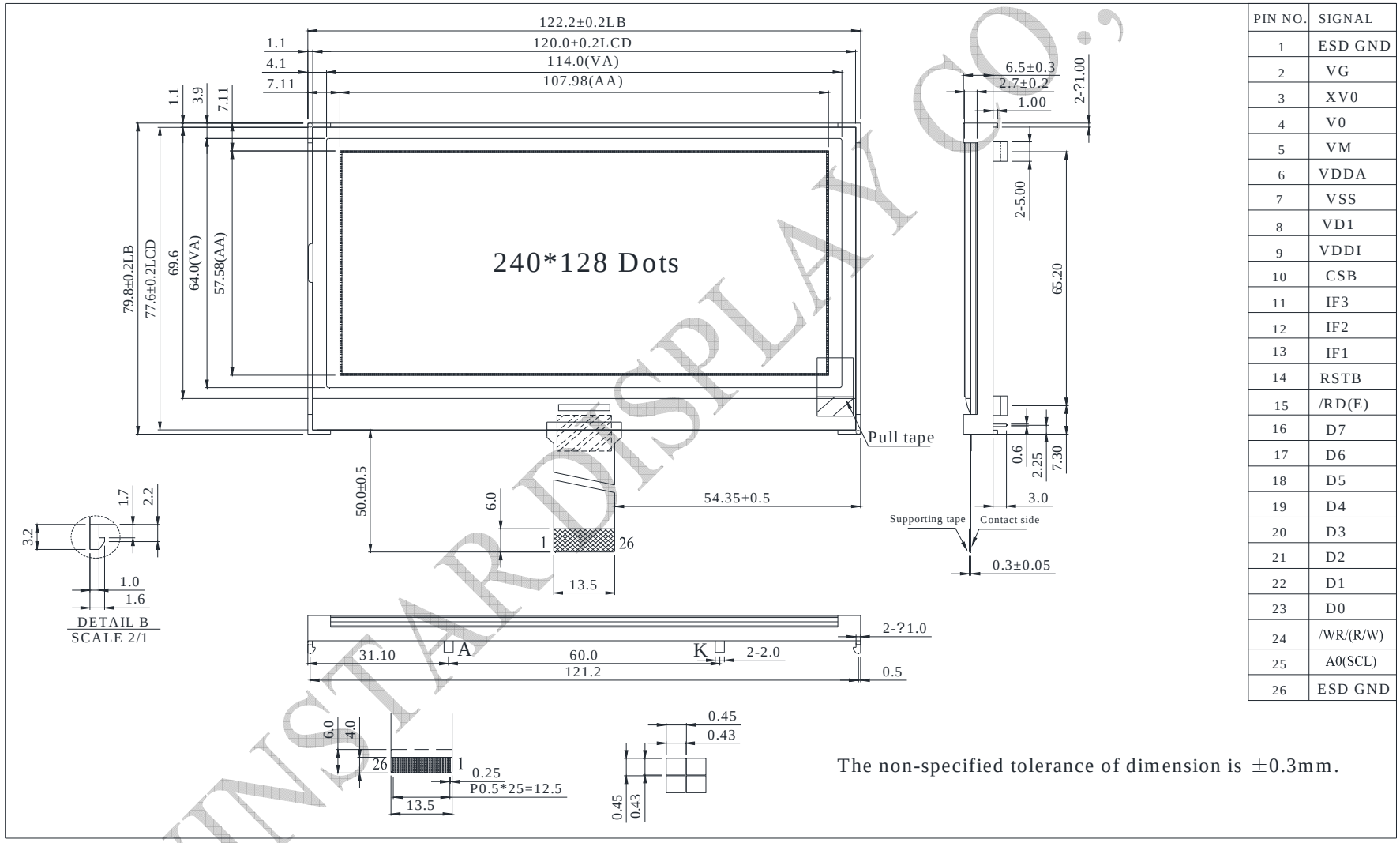
Please kindly consider to design the Vop to be adjustable while programing the software to match LCD contrast tolerance.

Interface Pin Function

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>1</td><td>ESD GND</td><td>Electro-Static discharge</td></tr>
<tr><td>2</td><td>VG</td><td>VG is the power of SEG-drivers</td></tr>
<tr><td>3</td><td>XV0</td><td>Negative operating voltage of COM-drivers</td></tr>
<tr><td>4</td><td>V0</td><td>Positive operating voltage of COM-drivers</td></tr>
<tr><td>5</td><td>VM</td><td>VM is the non-select voltage level of COM-drivers</td></tr>
<tr><td>6</td><td>VDDA</td><td>Power supply</td></tr>
<tr><td>7</td><td>VSS</td><td>Ground</td></tr>
<tr><td>8</td><td>VD1</td><td>Digital power source selection</td></tr>
<tr><td>9</td><td>VDDI</td><td>VDD1 is the power of interface I/O circuit</td></tr>
<tr><td>10</td><td>CSB</td><td>Chip select input pin
CSB=“L”: This chip is selected and the MPU interface is active
CSB=“H”: This chip is not selected and the MPU interface is disabled
(D[7:0] are high impedance)</td></tr>
<tr><td>11
12
13</td><td>IF3
IF2
IF1</td><td>These pins select interface operation mode
<table>
<tr><th>IF3</th><th>IF2</th><th>IF1</th><th>MPU interface type</th></tr>
<tr><td>H</td><td>H</td><td>L</td><td>80 series 8-bit parallel</td></tr>
<tr><td>H</td><td>L</td><td>L</td><td>68 series 8-bit parallel</td></tr>
<tr><td>L</td><td>H</td><td>H</td><td>8-bit serial (4-Line)</td></tr>
<tr><td>L</td><td>H</td><td>L</td><td>9-bit serial (3-Line)</td></tr>
</table>
Note: Refer to “Interface Selection” for detailed information</td></tr>
<tr><td>14</td><td>RSTB</td><td>Reset input pin. When RSTB is “L”, internal initialization procedure is executed</td></tr>
<tr><td>15</td><td>/RD(E)</td><td>Read / Write execution control pin. (This pin is only used in parallelinterface)
<table>
<tr><th>MPU Type</th><th>ERD</th><th>Description</th></tr>
<tr><td>6800-series</td><td>E</td><td>Read / Write control input pin.
R/W = “H”: When E is “H”, data bus is in output status.
R/W = “L”: The data are latched at the falling edge of the E signal.</td></tr>
<tr><td>8080-series</td><td>/RD</td><td>Read enable input pin.
When /RD is “L”, data bus is in output status.</td></tr>
</table>
This pin is not used in serial interfaces and should be connected to VDD1</td></tr>
</table>

<table>
<tr><td>16~23</td><td>D7~D0</td><td>The bi-directional data bus of the MPU interface. When CSB is “H”, they are high impedance
If using serial interface:
D0 is the SDA signal in 4-Line & 3-Line interface
D1 is the A0 signal in 4-Line interface</td></tr>
<tr><td>24</td><td>/WR/(R/W)</td><td>Read / Write execution control pin. (This pin is only used in parallel interface)
<table><tr><th>MPU Type</th><th>RWR</th><th>Description</th></tr><tr><td>6800-series</td><td>R/W</td><td>Read / Write control input pin
R/W = “H” : read
R/W = “L” : write</td></tr><tr><td>8080-series</td><td>/WR</td><td>Write enable clock input pin.
The data are latched at the rising edge of the /WR signal.</td></tr></table>This pin is not used in serial interfaces and should be connected to VDD1</td></tr>
<tr><td>25</td><td>A0(SCL)</td><td>The function of this pin is different in parallel and serial interface
In parallel interface: A0 is register selection input
A0 = "H": inputs on data bus are display data
A0 = "L": inputs on data bus are command
In serial interface: this pad will be used as SCL (serial-clock) input</td></tr>
<tr><td>26</td><td>ESD GND</td><td>Electro-Static discharge</td></tr>
</table>

Contour Drawing & Block Diagram



PIN NO.	SIGNAL
1	ESD GND
2	VG
3	XV0
4	V0
5	VM
6	VDDA
7	VSS
8	VD1
9	VDDI
10	CSB
11	IF3
12	IF2
13	IF1
14	RSTB
15	/RD(E)
16	D7
17	D6
18	D5
19	D4
20	D3
21	D2
22	D1
23	D0
24	/WR/(R/W)
25	A0(SCL)
26	ESD GND

The non-specified tolerance of dimension is ±0.3mm.