



**WINSTAR Display Co.,Ltd.**  
**華凌光電股份有限公司**

## SPECIFICATION

**MODULE NO.: WO240128B**

### 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
Drive Method	1/128D , 1/12B	
Backlight Type	LED	
IC	ST7586S	
Interface	6800/8080/3 Line/4 Line	

# Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>OP</sub>	-20	—	+70	°C
Storage Temperature	T <sub>ST</sub>	-30	—	+80	°C
Digital Power Supply Voltage	V <sub>DDI</sub>	-0.3	—	3.6	V
Analog Power supply voltage	V <sub>DDA</sub>	-0.3	—	3.6	V
LCD Power supply voltage	V <sub>0</sub> -XV <sub>0</sub>	-0.3	—	19	V
LCD Power supply voltage	V <sub>G</sub>	-0.3	—	5.5	V

# Electrical Characteristics

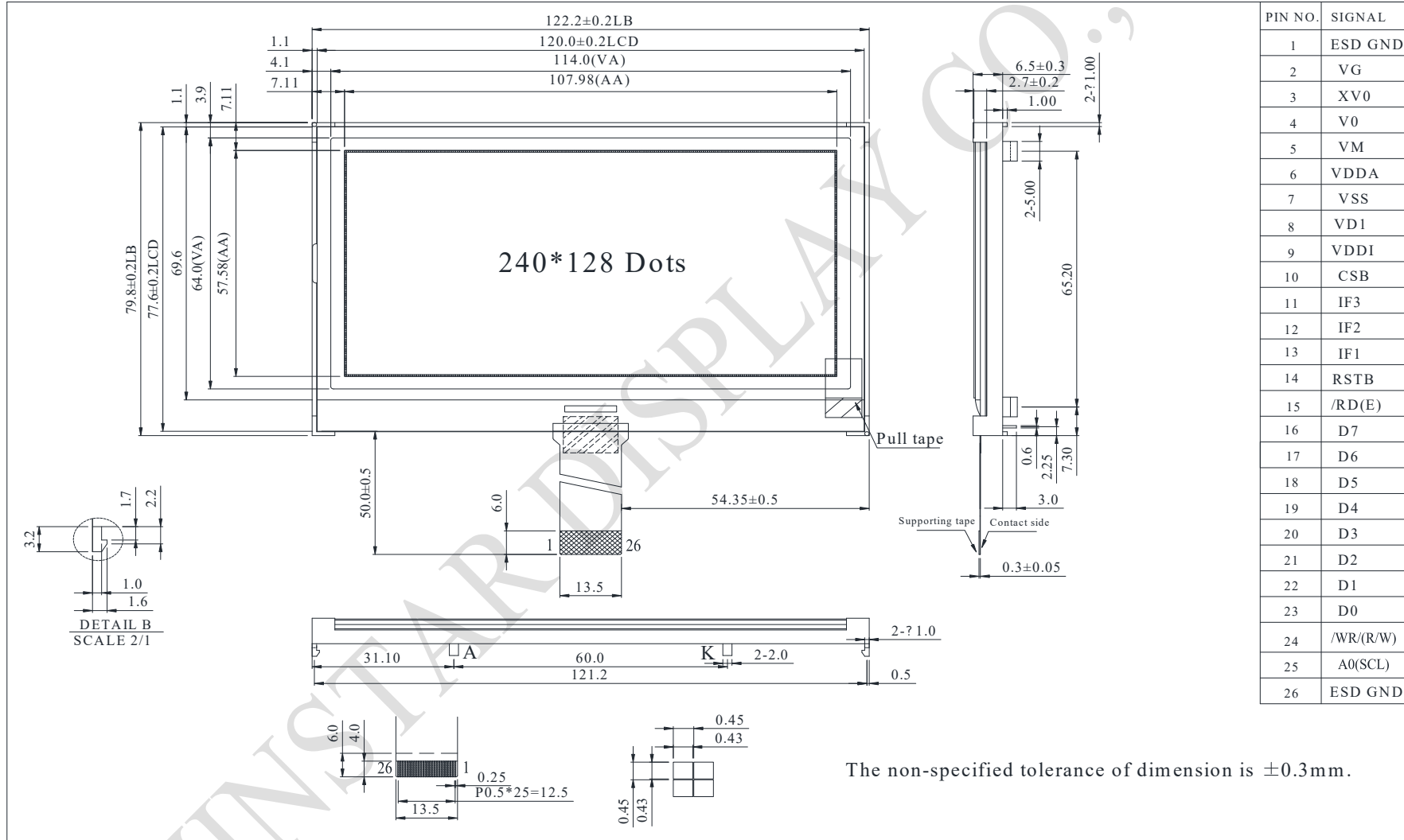
Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V <sub>DD</sub> -V <sub>SS</sub>	—	3.0	3.3	3.6	V
Supply Voltage For LCM	V <sub>OP</sub>	T <sub>a</sub> =-20°C	—	—	—	V
		T <sub>a</sub> =25°C	14.8	15.0	15.2	V
		T <sub>a</sub> =+70°C	—	—	—	V
Input High Volt.	V <sub>IH</sub>	—	0.7V <sub>DD</sub>	—	V <sub>DD</sub>	V
Input Low Volt.	V <sub>IL</sub>	—	V <sub>SS</sub>	—	0.3 V <sub>DD</sub>	V
Output High Volt.	V <sub>OH</sub>	—	0.8 V <sub>DD</sub>	—	V <sub>DD</sub>	V
Output Low Volt.	V <sub>OL</sub>	—	V <sub>SS</sub>	—	0.2V <sub>DD</sub>	V
Supply Current	I <sub>DD</sub>	V <sub>DD</sub> =3.3V	—	2.0	4.0	mA

# Interface Pin Function

Pin No.	Symbol	Description																				
1	ESD GND	Electro-Static discharge																				
2	VG	VG is the power of SEG-drivers																				
3	XV0	Negative operating voltage of COM-drivers																				
4	V0	Positive operating voltage of COM-drivers																				
5	VM	VM is the non-select voltage level of COM-drivers																				
6	VDDA	Power supply																				
7	VSS	Ground																				
8	VD1	Digital power source selection																				
9	VDDI	VDD1 is the power of interface I/O circuit																				
10	CSB	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)																				
11	IF3	These pins select interface operation mode																				
12	IF2	<table border="1"> <thead> <tr> <th>IF3</th> <th>IF2</th> <th>IF1</th> <th>MPU interface type</th> </tr> </thead> <tbody> <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> </tbody> </table>	IF3	IF2	IF1	MPU interface type	H	H	L	80 series 8-bit parallel	H	L	L	68 series 8-bit parallel	L	H	H	8-bit serial (4-Line)	L	H	L	9-bit serial (3-Line)
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13	IF1	Note: Refer to "Interface Selection" for detailed information																				
14	RSTB	Reset input pin. When RSTB is "L", internal initialization procedure is executed																				
15	/RD(E)	Read / Write execution control pin. (This pin is only used in parallel interface) <table border="1"> <thead> <tr> <th>MPU Type</th> <th>ERD</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>6800-series</td> <td>E</td> <td>Read / Write control input pin. RW = "H": When E is "H", data bus is in output status. RW = "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> </tbody> </table> <p>This pin is not used in serial interfaces and should be connected to VDD1</p>	MPU Type	ERD	Description	6800-series	E	Read / Write control input pin. RW = "H": When E is "H", data bus is in output status. RW = "L": The data are latched at the falling edge of the E signal.	8080-series	/RD	Read enable input pin. When /RD is "L", data bus is in output status.											
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16~23	D7~D0	<p>The bi-directional data bus of the MPU interface. When CSB is “H”, they are high impedance</p> <p>If using serial interface:  D0 is the SDA signal in 4-Line &amp; 3-Line interface  D1 is the A0 signal in 4-Line interface</p>									
24	/WR/(R/W)	<p>Read / Write execution control pin. (This pin is only used in parallel interface)</p> <table border="1"> <thead> <tr> <th>MPU Type</th> <th>RWR</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>This pin is not used in serial interfaces and should be connected to VDD1</p>	MPU Type	RWR	Description	6800-series	R/W	Read / Write control input pin R/W = "H" : read R/W = "L" : write	8080-series	/WR	Write enable clock input pin. The data are latched at the rising edge of the /WR signal.
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25	A0(SCL)	<p>The function of this pin is different in parallel and serial interface</p> <p>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</p> <p>In serial interface: this pad will be used as SCL (serial-clock) input</p>									
26	ESD GND	Electro-Static discharge									

# Contour Drawing



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