LCD / LCM SPECIFICATION

WINSTAR Display Co.,Ltd.

華凌光電股份有限公司

SPECIFICATION

MODULE NO.: WO12864B

General Specification

Item	Dimension	Unit
Number of dots	128 x 64	—
Module dimension	89.7x 49.8 x 11.8	mm
View area	69.0 x 36.5	mm
Active area	63.97 x31.97	mm
Dot size	0.47 x0.47	mm
Dot pitch	0.5 x 0.5	mm
Duty	1/65 , 1/9 Bias	
Backlight Type	LED	
IC	ST7565P	
Interface	6800/8080/4-Line SPI	

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Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	-20	–	+70	℃
Storage Temperature	T_{ST}	-30	–	+80	℃
Power Supply Voltage	VDD	-0.3	–	3.6	V
Power supply voltage (VDD standard)	V0, VOUT	-0.3	–	14.5	V
Power supply voltage (VDD standard)	V1, V2, V3, V4	-0.3	–	V0+0.3	V

Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	–	2.7	–	3.3	V
Supply Voltage For LCM	Vo-V_{SS}	Ta=-20℃ Ta=25℃ Ta=70℃	9.5 9.2 8.95	9.8 9.45 9.2	10.5 9.7 9.45	V V V
Input High Volt.	V_{IH}	–	0.8 V_{DD}	–	V_{DD}	V
Input Low Volt.	V_{IL}	–	Vss	–	0.2 V_{DD}	V
Output High Volt.	V_{OH}	I_{OUT}=-0.5mA	0.8 V_{DD}	–	V_{DD}	V
Output Low Volt.	V_{OL}	I_{OUT}=0.5mA	Vss	–	0.2V_{DD}	V
Supply Current(No include LED Backlight)	I_{DD}	–	–	0.60	2.0	mA

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Interface Pin Function

Pin No.	Symbol	I/O	Description
1	/CS1B	I	This is the chip select signal.
2	/RES	I	When RES is set to “L”, the setting are initialized.
3	A0	I	This is connect to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or command. A0 = “H”: Indicates that D0 to D7 are display data. A0 = “L”: Indicates that D0 to D7 are control data.
4	/WR(R/W)	I	• When connected to 8080 series MPU, this pin is treated as the “/WR” signal of the 8080 MPU and is LOW-active. The signals on the data bus are latched at the rising edge of the /WR signal. • When connected to 6800 series MPU, this pin is treated as the “R/W” signal of the 6800 MPU and decides the access type : When R/W = “H”: Read. When R/W = “L”: Write.
5	/RD(E)	I	• When connected to 8080 series MPU, this pin is treated as the “/RD” signal of the 8080 MPU and is LOW-active. The data bus is in an output status when this signal is “L”. • When connected to 6800 series MPU, this pin is treated as the “E” signal of the 6800 MPU and is HIGH-active. This is the enable clock input terminal of the 6800 Series MPU.
6~13	D0~ D7	I/O	Data bus line
14	VDD	Power Supply	Power supply
15	VSS	Power Supply	Ground
16	VOUT	O	DC/DC voltage converter. Connect a capacitor between this terminal and vss or VDD
17	CAP3P	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.
18	CAP1N	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1P terminal.

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<table>
<tr><td>19</td><td>CAP1P</td><td>O</td><td>DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.</td></tr>
<tr><td>20</td><td>CAP2P</td><td>O</td><td>DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2N terminal.</td></tr>
<tr><td>21</td><td>CAP2N</td><td>O</td><td>DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2P terminal.</td></tr>
<tr><td>22~26</td><td>V4~ V0</td><td>Power Supply</td><td>This is a multi-level power supply for the liquid crystal drive.</td></tr>
<tr><td>27</td><td>VR</td><td>I</td><td>Output voltage regulator terminal. Provides the voltage between VSS and V0 through a resistive voltage divider.</td></tr>
<tr><td>28</td><td>C86</td><td>I</td><td>This is the MPU interface selection pin.
C86 = “H”: 6800 Series MPU interface.
C86 = “L”: 8080 Series MPU interface</td></tr>
<tr><td>29</td><td>P/S</td><td>I</td><td>This is the parallel data input/serial data input switch terminal.
P/S = “H”: Parallel data input.
P/S = “L”: Serial data input.
The following applies depending on the P/S status:
<table><tr><th>P/S</th><th>Data/Command</th><th>Data</th><th>Read/Write</th><th>Serial Clock</th></tr><tr><td>“H”</td><td>A0</td><td>D0 to D7</td><td>/RD, /WR</td><td>X</td></tr><tr><td>“L”</td><td>A0</td><td>SI (D7)</td><td>Write only</td><td>SCL (D6)</td></tr></table>When P/S = “L”, D0 to D5 fixed “H”.
/RD (E) and /WR (R/W) are fixed to either “H” or “L”.
With serial data input, It is impossible read data from RAM</td></tr>
<tr><td>30</td><td>NC</td><td>-</td><td>No connection.</td></tr>
</table>

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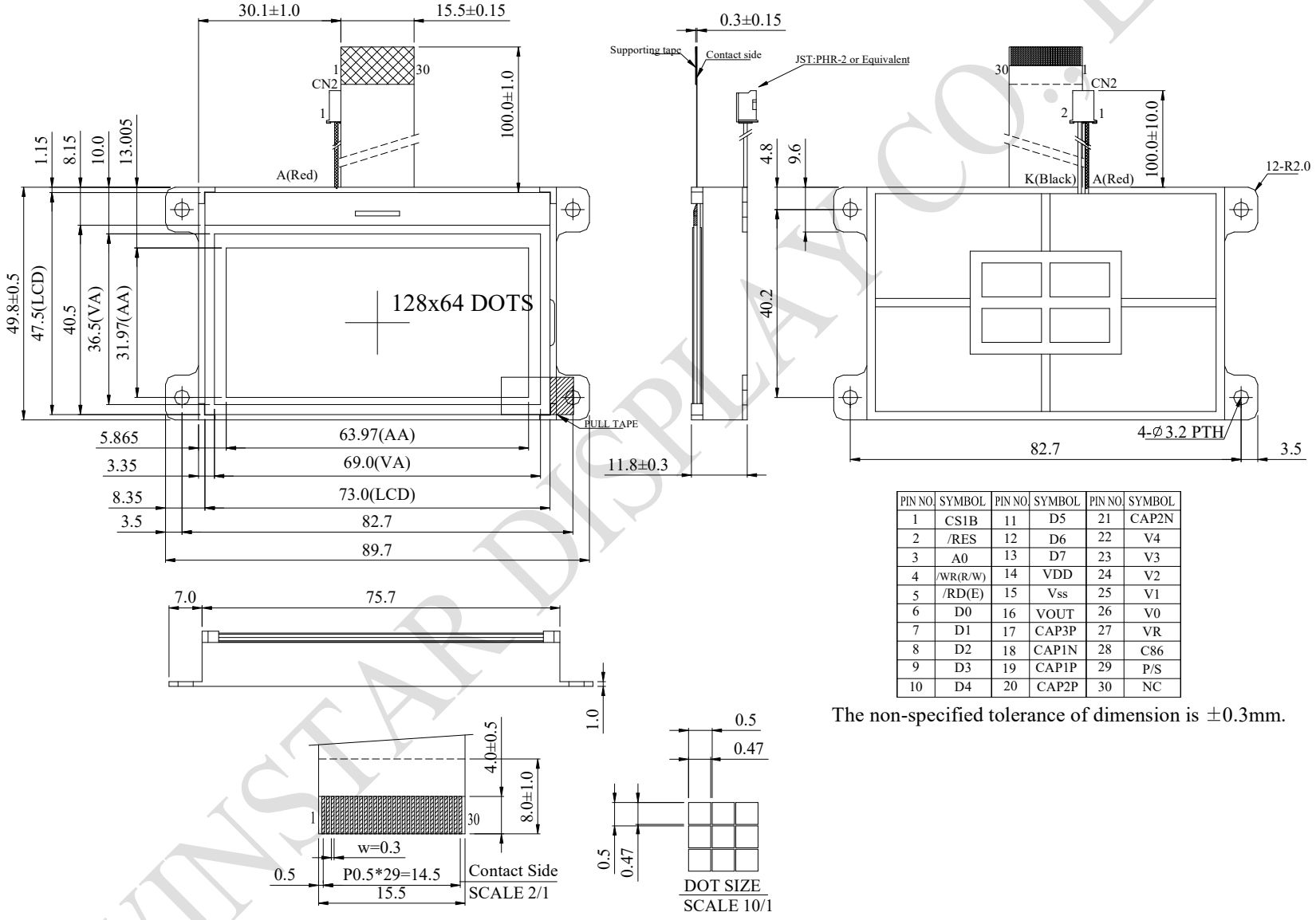
Contour Drawing



PIN NO.	SYMBOL	PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	CS1B	11	D5	21	CAP2N
2	/RES	12	D6	22	V4
3	A0	13	D7	23	V3
4	/WR(R/W)	14	VDD	24	V2
5	/RD(E)	15	Vss	25	V1
6	D0	16	VOUT	26	V0
7	D1	17	CAP3P	27	VR
8	D2	18	CAP1N	28	C86
9	D3	19	CAP1P	29	P/S
10	D4	20	CAP2P	30	NC

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

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