



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

## SPECIFICATION

**MODULE NO.: WO12864A1**

### General Specification

Item	Dimension	Unit
Number of Dots	128 x 64 dots	—
Module dimension	60.1x 44.5 x5.01(MAX)	mm
View area	54.6 x 32.0	mm
Active area	49.89 x27.49	mm
Dot size	0.36 x0.4	mm
Dot pitch	0.39 x 0.43	mm
Duty	1/65 , 1/9 Bias	
Backlight Type	LED	
IC	ST7565P	
Interface	6800/8080/4-Line SPI	

# 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
Power Supply Voltage	V <sub>DD</sub>	-0.3	—	3.6	V
Power supply voltage (VDD standard)	V <sub>0</sub> , V <sub>OUT</sub>	-0.3	—	14.5	V
Power supply voltage (VDD standard)	V <sub>1</sub> , V <sub>2</sub> , V <sub>3</sub> , V <sub>4</sub>	-0.3	—	V <sub>0</sub> +0.3	V

# Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V <sub>DD</sub> -V <sub>SS</sub>	—	2.7	3.0	3.3	V
Supply Voltage For LCM	V <sub>0</sub> -V <sub>SS</sub>	T <sub>a</sub> =-20°C	—	—	—	V
		T <sub>a</sub> =25°C	9.2	9.5	9.8	V
		T <sub>a</sub> =70°C	—	—	—	V
Input High Volt.	V <sub>IH</sub>	—	0.8 V <sub>DD</sub>	—	V <sub>DD</sub>	V
Input Low Volt.	V <sub>IL</sub>	—	V <sub>SS</sub>	—	0.2 V <sub>DD</sub>	V
Output High Volt.	V <sub>OH</sub>	I <sub>OUT</sub> =-0.5mA	0.8 V <sub>DD</sub>	—	V <sub>DD</sub>	V
Output Low Volt.	V <sub>OL</sub>	I <sub>OUT</sub> =0.5mA	V <sub>SS</sub>	—	0.2V <sub>DD</sub>	V
Supply Current(No include LED Backlight)	I <sub>DD</sub>	V <sub>DD</sub> =3.0V	—	0.10	2.0	mA

# Interface Pin Function

Pin No.	Symbol	Level	Description
1	P/S	I	This is the parallel data input/serial data input switch terminal.
2	C86	I	This is the MPU interface switch terminal.
3	VR	I	Output voltage regulator terminal. Provides the voltage between VSS and V0 through a resistive voltage divider.
4~8	V0~V4	Power supply	This is a multi-level power supply for the liquid crystal drive.
9	CAP2N	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2P terminal.
10	CAP2P	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2N terminal.
11	CAP1P	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.
12	CAP1N	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1P terminal.
13	CAP3P	O	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.
14	VOUT	O	DC/DC voltage converter. Connect a capacitor between this terminal and vss or VDD
15	VSS	Power supply	Ground
16	VDD	Power supply	Power supply
17~24	D7~ D0	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus.
25	/RD(E)	I	The data bus is in output status when this signal is "L"
26	/WR(R/W)	I	The data bus are latched at the rising edge of the WR signal
27	A0	I	This is connect to the least significant bit of the Norman MPU address bus, and it determines whether the data bits are data or a command.
28	/RES	I	When RES is set to "L", the setting are initialized.
29	/CS1	I	This is the chip select signal.

# Contour Drawing

