Winstar Display Co., LTD
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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WX12864T-NFK#

APPROVED BY: (FOR CUSTOMER USE ONLY)	**PCB VERSION:** **DATA:**

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
first FC components			

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2013/07/24		First issue

General Specification

Item	Dimension	Unit
Number of dots	128 x 64	—
Module dimension	34.0 x 43.72 x1.6(MAX)	mm
View area	29.58 x 17.98	mm
Active area	25.58 x 15.98	mm
Dot size	0.23 x 0.18	mm
Dot pitch	0.25 x 0.20	mm
LCD type	FSTN Positive Transflective (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/64	
View direction	12 o'clock	
Backlight Type	Without backlight	
IC	NT7534	

Interface Pin Function

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>I/O</th><th>Description</th></tr>
<tr><td>1</td><td>NC</td><td></td><td>No connection</td></tr>
<tr><td>2</td><td>IRS</td><td>I</td><td>This terminal selects the resistors for the V0 voltage level adjustment
IRS = “H”, Use the internal resistors
IRS = “L”, Do not use the internal resistors
The V0 voltage level is regulated by an external resistive voltage divider attached to the VR terminal. This pad is enabled only when the master operation mode is selected. It is fixed to either “H” or “L” when the slave operation mode is selected</td></tr>
<tr><td>3</td><td>/HPM</td><td>I</td><td>This is the power control terminal for the power supply circuit for liquid crystal drive.
/HPM = “H”, Normal power mode
/HPM = “L” ,High power mode
This pad is enabled only when the master operation mode is selected and it is fixed to either “H” or “L” when the slave operation mode is selected.</td></tr>
<tr><td>4</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><td>P/S</td><td>Data/Command</td><td>Data</td><td>Read/Write</td><td>Serial Clock</td></tr>
<tr><td>“H”</td><td>A0</td><td>D0 to D7</td><td>/RD, /WR</td><td>-</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”, fix D0~D5 pads to VDD or VSS level. /RD(E) and /WR (R/W) are fixed to either “H” or “L”. With serial data input ,RAM display data reading is not supported.</td></tr>
<tr><td>5</td><td>C86</td><td>I</td><td>This is the MPU interface switch terminal
C86 = “H”:6800 Series MPU interface
C86 = “L”:8080 Series MPU interface</td></tr>
</table>

6	CLS	I	Terminal to select whether enable or disable the display clock internal oscillator circuit. CLS = "H": Internal oscillator circuit for display is enabled CLS = "L": Internal oscillator circuit for display is enabled (requires external input) When CLS = "L", input the display clock through the CL pad.
7	M/S	I	This terminal selects the master/slave operation for the NT7534 chips. Master operation outputs the timing signals that required for LCD display, while slave operation inputs the timing signals required for the liquid crystal display, synchronizing the liquid crystal display system.
8	VR	I	Voltage adjustment pad. Applies voltage between V0 and VSS using a resistive divider.
9	V0	I/O	LCD driver supplies voltages. The voltage determined by the LCD cell is impedance-converted by a resistive driver or an operation amplifier for application. Voltages should be according to the following relationship: V0≧V1≧V2≧V3≧V4≧VSS2 When the on-chip operating power circuit is on ,the following voltages are supplied to V1 to V4 by the on-chip power circuit. Voltages selection is performed by the LCD Bias Set command.
10	V4		
11	V3		
12	V2		
13	V1		
14	NC		No connection
15	NC		No connection
16	C2-	O	Capacitor 2-pad for internal DC/DC voltage converter.
17	C2+	O	Capacitor 2+pad for internal DC/DC voltage converter.
18	C1+		Capacitor 1+pad for internal DC/DC voltage converter.
19	C1-		Capacitor 1-pad for internal DC/DC voltage converter.
20	C3+		Capacitor 3+pad for internal DC/DC voltage converter.
21	NC		No connection
22	VOUT	I/O	DC/DC voltage converter output
23	VSS	O	Ground output for pad option.
24	VDD2	Supply	These are the power supply pads for the step-up voltage circuit for the LCD. These pads must be connected to each other.
25	VDD	O	Power supply output for pad option

26	DUTY1	I	Select the maximum LCD driver duty
27	DUTY0		
28	D7	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus. When the serial interface is selected (P/S= “L”), then D7 serves as the serial data input terminal (SI) and D6 serves as the serial clock input terminal (SCL). When the serial interface is selected , fix D0~D5 pads to VDD or VSS level. When the chip select is inactive, D0 to D7 are set to high impedance.
29	D6		
30	D5		
31	D4		
32	D3		
33	D2		
34	D1		
35	D0		
36	/RD	I	When connected to an 8080 MPU ,it is active LOW. This pad is connected to the /RD signal of the 8080 MPU ,and the NT7534 data bus is in an output status when this signal is “L”. When connected to a 6800 Series MPU, this is active HIGH. This is used as an enable clock input of the 6800 series MPU
37	/WR	I	When connected to an 8080 MPU, this is active LOW . This terminal connects to the 8080 MPU, and the NT7534 data bus are latched at rising edge of the /WR signal. When connected to an 8080 MPU, this is the read/write control signal input terminal. When R/W= “H”: Read When R/W= “L”: Write
38	A0	I	This is connected to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command . A0=”H”: Indicate that D0 to D7 are display data A0=”L”: Indicate that D0 to D7 are control data
39	/RES	I	When /RES is set to “L” the settings are initialized. The reset operation is performed by the /RES signal level.
40	CS2	I	This is the chip select signal
41	/CS1		This is the chip select signal
42	NC		No connection
43	/DOF	I/O	This is the liquid crystal display blanking control terminal. M/S=”H”:output M/S= “L”:Inptu When the NT7534chip is used in master/slave mode, the various DOF terminals must be connected.
44	CL		This is the display clock input terminal .When the NT7534 chips are used in master/slave mode ,the various CL terminals must be connected.

45	FR	I/O	This is the liquid crystal alternating current signal I/O terminal M/S=”H”:output M/S= “L”:Inptut When the NT7534chip is used in master/slave mode, the various FR terminals must be connected.
46	NC		No connection
47	NC		No connection
48	NC		No connection
49	NC		No connection

Contour Drawing

