

ERC12864F7-4

LCD Module User Manual

E'GO CHINA (SHENZHEN) ELECTRONICS CO.,LTD.

REV	Descriptions	Release Date
0.1	Prelimiay release	2007-05-29

Table of Content

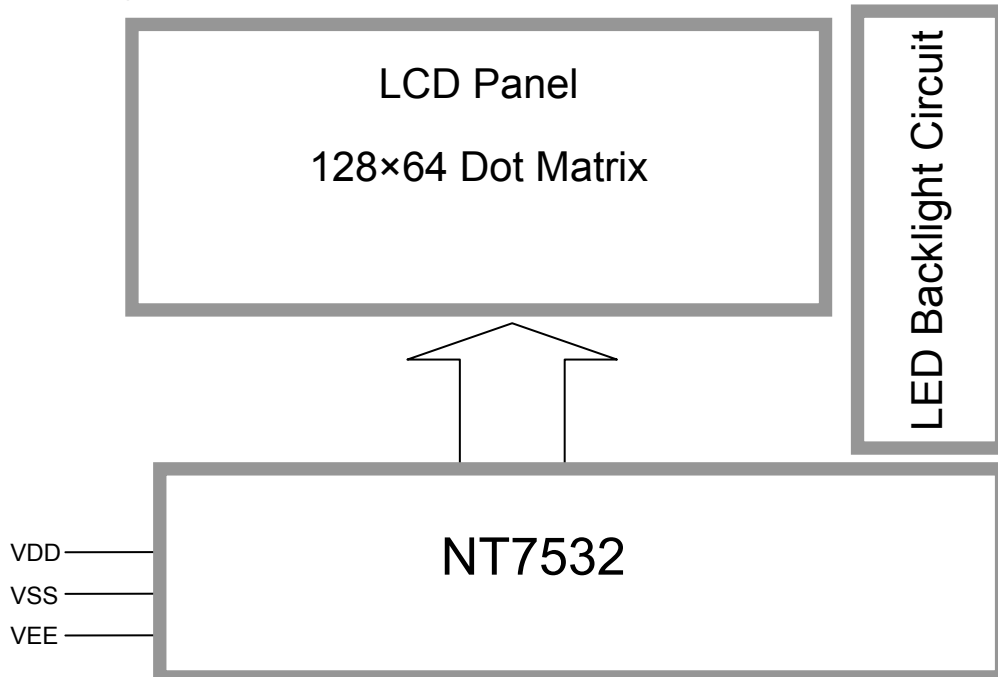
1. Basic Specifications	3
1.1 Display and Mechanical Specifications.....	3
1.2 Block Diagram.....	3
1.3 Terminal Functions.....	4
1.4 Mechanical Drawing	5
2. Absolute Maximum Ratings	6
3. Electrical Characteristics	7
4. IC Contents Attachment	7
5. LCM Numbering System	8
6. Design and Handling Precaution	9

1.0 Basic Specification

1.1 Display and Mechanical Specification

ITEM	STANDARD VALUE	UNIT
Display Type	128 X 64	Dots
LCD Type	FSTN/ Transflective/Positive	--
LCD Duty	1/64	--
LCD Bias	1/9	Bias
Viewing Direction	6:00	Clock
Backlight Type	Edge LED Backlight with RGB Color (White, Red ,Blue, Yellow, Green, Purple, Cyan)	--
Interface	6800/8080 series or Serial Interface	--
Driver IC	NT7532 (Gold Bump Chip)	--
IC Package	COG	--
Module Dimension	46.0(W)×36.0(H) ×6.3(T) (MAX)	mm
Visual Area	41.80(W) ×26.10(H)	mm
Dot size	0.29 ×0.34	mm
Dot Pitch	0.307 ×0.357	mm
Operating Temperature	-20 ~ 70	°C
Storage Temperature	-30 ~ 80	°C

1.2 Block Diagram



1.3 Terminal Functions

Pin No.	Pin Name	I/O	Descriptions
1	IRS	I	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.
2	P/S	I	This is the parallel data input/serial data input switch terminal. P/S = "H". Parallel data input. P/S = "L" . Serial data input.
3	C86	I	This is the MPU interface switch terminal. C86 = "H" : 6800 Series MPU interface C86 = "L" : 6800 SerieMs PU interface
4	VR	I	Voltage adjustment pad. Applies voltage between V0 and Vss using a resistive divider
5	V0	Supply	LCD driver supply voltages. The voltage determined by LCD cell is impedance-converted by a resistive driver or and according to the following relationship: $VDD (=V_0) \geq V_1 \geq V_2 \geq V_3 \geq V_4 \geq VSS$ When the on-chip operating power circuit is on the following voltages are supplied to V1 to V4 by the on-chip power circuit.
6	V4		
7	V3		
8	V2		
9	V1		
10	CAP2+	O	Capacitor 2 + pad for internal DC/DC voltage converter
11	CAP2-	O	Capacitor 2 -pad for internal DC/DC voltage converter
12	CAP1+	O	Capacitor 1+ pad for internal DC/DC voltage converter
13	CAP1-	O	Capacitor 1-pad for internal DC/DC voltage converter
14	CAP3+	O	Capacitor 3+ pad for internal DC/DC voltage converter
15	VOUT	Power	DC/DC voltage converter output
16	VSS	Power	Negative Power Supply, Ground(0V)
17	VDD	Power	Positive Power Supply
18-25	DB7-DB0	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 DB7 serves as the serial data input terminal (SI) and DB6 serves as the serial clock input terminal (SCL). At this time, DBO-DB5 are set to high impedance. When the chip select is inactive, DB0-DB7 are set to high impedance.
26	/RD(E)	I	When connected to an 8080 MPU, it is active Low. This pad is connected to the /RD signal of the 8080MPU,and the NT7532 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.
27	R/W(/WR)	I	When connected to an 8080 MPU, it is active Low. This pad is connected to the 8080MPU /WR signal, The signals on the data bus are latched at the rising edge of the /WR signal. When connected to a 6800 Series MPU: This is the read/write control signal input terminal.
			When R/W = "H" : Read When R/W = "L" : Write
28	A0(RS)	I	A0 = "H" : Indicates that DB0-DB7 are display data Ao = "L" : Indicates that DB0-DB7 are control data
29	/RET	I	Reset Signal /RES=L, Initialization is executed /RES=H, Normal running
30	/CS1	I	Chip Select /CS1=L, enable access to the LCD module /CS1=H, disable access to the LCD module

2. Absolute Maximum Ratings

Items	Symbol	Min	Max.	Unit	Condition
Supply Voltage (Logic)	V_{DD-VSS}	0	+8.0	V	$V_{SS}=0V$
Supply Voltage (LCD Driver)	V_{DD-VEE}	0	16.5	V	$V_{SS}=0V$
Input Voltage	V_{IN}	0	$V_{DD}+0.3$	V	$V_{SS}=0V$
Operating Temperature	T_{OP}	-20	+70	°C	No Condensation
Storage Temperature	T_{ST}	-30	+80	°C	No Condensation

Cautions:

Any stresses exceeding the Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

3. Electrical Characteristics

3.1 DC Characteristics

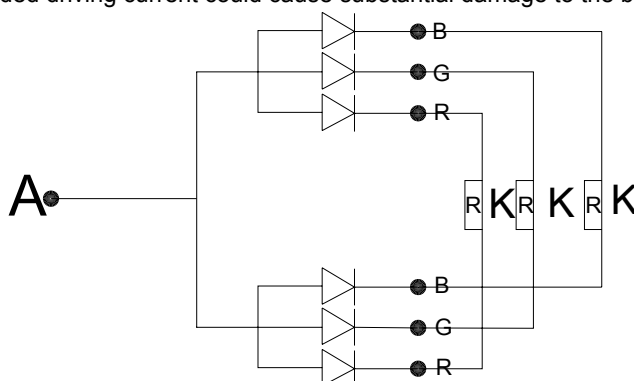
Items	Symbol	Min	Typ.	Max.	Unit	Condition
Supply Voltage (Logic)	V_{DD-VSS}	2.7	3.3	5.0	V	
Supply Voltage (LCD Driver)	V_{DD-VEE}	8.9	9.5	10.2	V	-20°C
		8.2	8.8	9.4		25°C
		7.5	8.0	8.6		70°C
Input Voltage	V_{IH}	$V_{SS}+2.0$	--	V_{DD}	V	--
	V_{IL}	$V_{SS}-0.8$	--	$V_{SS}+0.8$		
Logic Supply Current	I_{DD}	--	0.9	--	°C	$V_{DD-VSS}=3.0V$

3.2 LED Backlight Circuit Characteristics

Items	Symbol	MIN	TYP.	MAX.	Unit	Application pin
Forward Voltage	V_{fLED+}	-	3.0	-	V	LED+
Forward Current	I_{fLED+}	-	-	30	mA	LED+

Cautions:

Exceeding the recommended driving current could cause substantial damage to the backlight and shorten its lifetime.



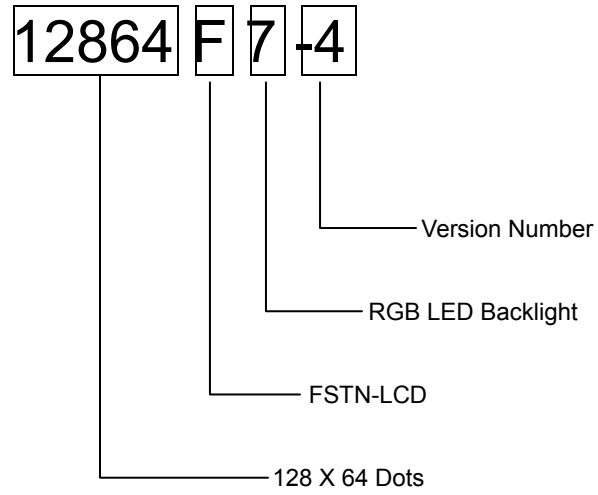
4. IC Contents Attachment:

Reference Documents From NOVATEK NT7532 LCD Driver with

Contents

NT7532 (Version 2.0)	Page
1. General Description.....	P4
2. BLOCK DIAGRAM	P5
3. DECRIPITON OF FUCTIONS.....	P10
4. COMMAND DECRIPITON.....	P37
5. TIMING CHARACTRISTICS.....	P50

5. LCM Numbering System



6. Design and Handling Precaution

- 1.0 The LCD panel is made by glass. Any mechanical shock (eg. dropping from high place) will damage the LCD module.
 - 2.0 Do not add excessive force on the surface of the display, which may cause the Display color change abnormally.
 - 3.0 The polarizer on the LCD is easily get scratched. If possible, do not remove the LCD protective film until the last step of installation.
 - 4.0 Never attempt to disassemble or rework the LCD module.
 - 5.0 Only Clean the LCD with Isopropyl Alcohol or Ethyl Alcohol. Other solvents (eg. water) may damage the LCD.
 - 6.0 When mounting the LCD module, make sure that it is free from twisting, warping and distortion.
 - 7.0 Ensure to provide enough space (with cushion) between case and LCD panel to prevent external force adding on it, or it may cause damage to the LCD or degrade the display result.
 - 8.0 Only hold the LCD module by its side. Never hold LCD module by adds force on the heat seal or TAB.
 - 9.0 Never add force to component of the LCD module. It may cause invisible damage or degrade of the reliability.
 - 10.0 LCD module could be easily damaged by static electricity. Be careful to maintain an optimum anti-static work environment to protect the LCD module.
 - 11.0 When peeling off the protective film from LCD, static charge may cause abnormal display pattern. It is normal and will resume to normal in a short while.
 - 12.0 Take care and prevent get hurt by the LCD panel sharp edge.
 - 13.0 Never operate the LCD module exceed the absolute maximum ratings.
 - 14.0 Keep the signal line as short as possible to prevent noisy signal applying to LCD module.
 - 15.0 Never apply signal to the LCD module without power supply.
 - 16.0 IC chip (eg. TAB or COG) is sensitive to the light. Strong lighting environment could Possibly cause malfunction. Light sealing structure casing is recommend.
 - 17.0 LCD module reliability may be reduced by temperature shock.
 - 18.0 When storing the LCD module, avoid exposure to the direct sunlight, high humidity, high temperature or low temperature. They may damage or degrade the LCD module
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