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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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NHD-C12864HZ-FN-FBW

COG (Chip-On-Glass) Liquid Crystal Display Module

NHD-	Newhaven Display
C12864-	128 x 64 pixels
HZ-	Model
F-	Transflective
N-	No backlight
F-	FSTN (+)
B-	6:00 view
W-	Wide Temp (-20°C ~ +70°C)
	RoHS Compliant

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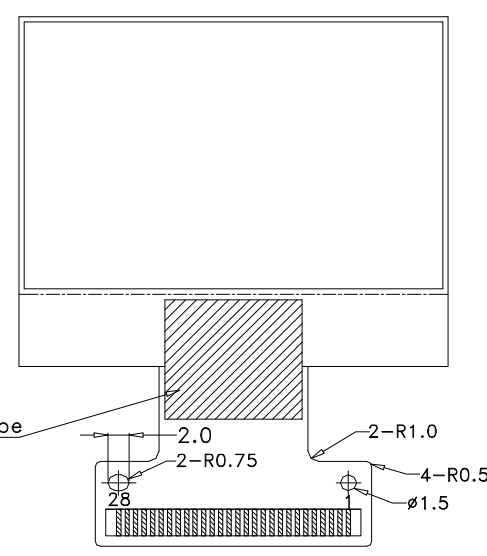
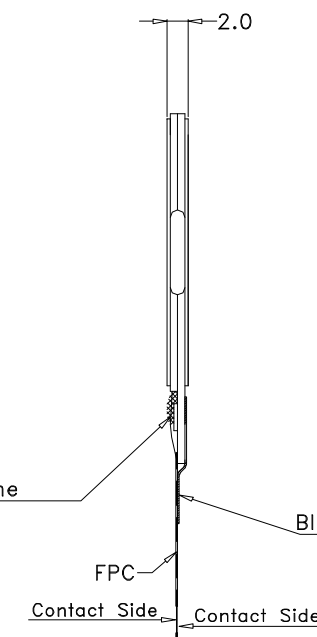
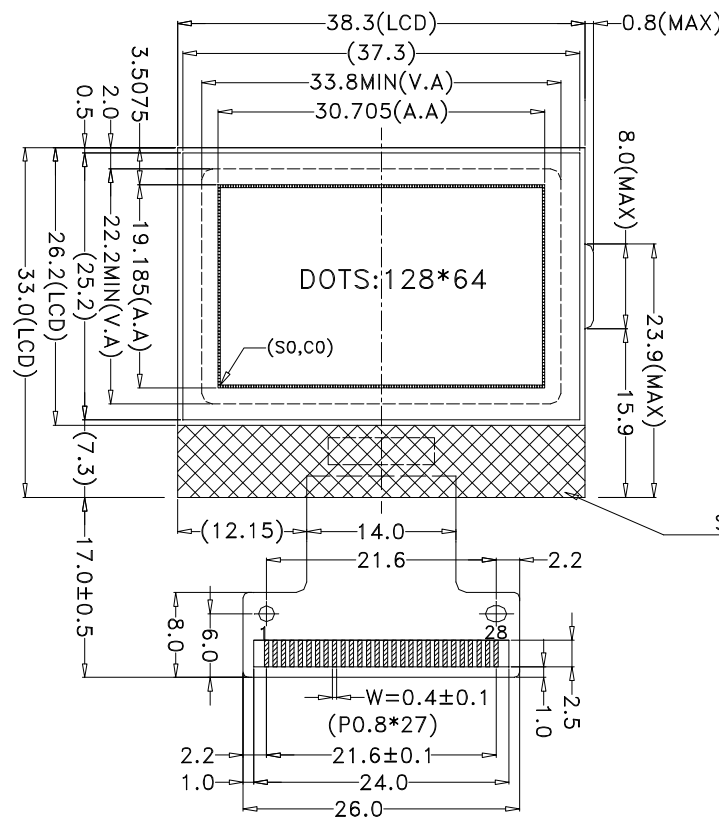
Document Revision History

Revision	Date	Description	Changed by
0	1/29/2008	Initial Release	-
1	9/29/2009	User guide reformat	BE
2	10/13/2009	Updated Electrical Characteristic	MC
3	12/4/2009	Corrected Storage Temperature	MC
4	3/10/2010	Corrected Pin 28 to "Active LOW chip select"	MC

Functions and Features

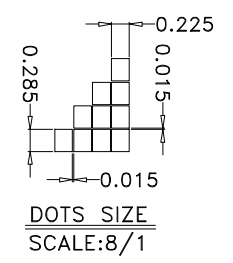
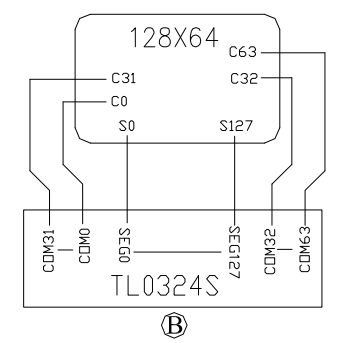
- 128 x 64 Pixels
- Built-in TL0324S controller
- 3.0V Power Supply
- 1/65 duty cycle; 1/9 bias
- Parallel Interface
- RoHS Compliant

REV	DESCRIPTION:	DATE
1.0		2/12/2007



PIN ASSIGNMENT

1	VDD
2	C86
3	VSS
4	V0
5	V4
6	V3
7	V2
8	V1
9	C2-
10	C2+
11	C1+
12	C1-
13	C3+
14	VOUT
15	VSS
16	D7
17	D6
18	D5
19	D4
20	D3
21	D2
22	D1
23	D0
24	E
25	RW
26	RS
27	RESET
28	/CS1



Display Type TRANSFLECTIVE/FSTN POSITIVE
 Display Resolution DOTS: 128*64
 Viewing Angle 6:00
 Max.Ratio and Bias Level 1/65DUTY, 1/9BIAS
 LCD Controller/Driver TL0324S(COG) (B)
 Logic Voltage 3.0V
 LCD Driving Voltage TBD
 Operation Temperature -20°C ~ 70°C
 Storage Temperature -30°C ~ 80°C

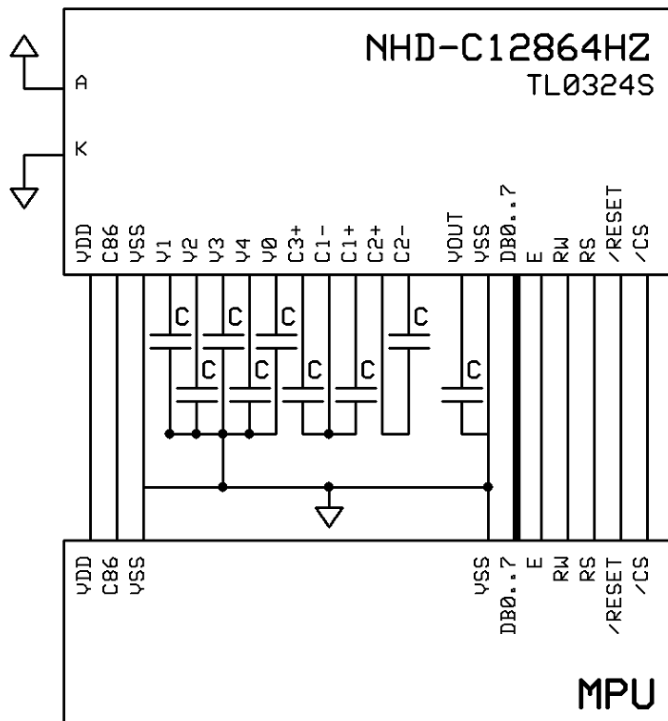
Model Name: NHD-C12864HZ-FN-FBW		Newhaven Display	
GENERAL TOL: ± 0.2			
APPROVALS	DATE	DRAWN NO.	SCALE:
DWN:	9/24/09		1:1
CHK:		SIZE:	UNIT:
APP:		A4	mm
			Page:
			1-1

Pin Description and Wiring Diagram

Pin No.	Symbol	External Connection	Function Description
1	VDD	Power Supply	Power supply for logic (+3.0V)
2	C86	MPU	Select MPU interface pin. C86=H: 6800; C86=L: 8080
3	VSS	Power Supply	Ground
4	V0	Power Supply	1.0uF-2.2uF cap to VSS
5	V4	Power Supply	1.0uF-2.2uF cap to VSS
6	V3	Power Supply	1.0uF-2.2uF cap to VSS
7	V2	Power Supply	1.0uF-2.2uF cap to VSS
8	V1	Power Supply	1.0uF-2.2uF cap to VSS
9	C2-	Power Supply	Connect to 1uF cap to CAP2+ (PIN 10)
10	C2+	Power Supply	Connect to 1uF cap to CAP2- (PIN 9)
11	C1+	Power Supply	Connect to 1uF cap to CAP1-(PIN 12)
12	C1-	Power Supply	Connect to 1uF cap to CAP1+(PIN 11) and CAP3+(PIN 13)
13	C3+	Power Supply	Connect to 1uF cap to CAP1- (PIN 12)
14	Vout	Power Supply	Connect to 1uF cap to Vss
15	VSS	Power Supply	Ground
16-23	DB7-DB0	MPU	8 bi-directional three-state data bus lines.
24	E	MPU	Operation enable signal. Falling edge triggered.
25	RW	MPU	Read/write select signal. R/W=1: Read R/W=0: Write
26	RS	MPU	Register select signal. RS=0: Command, RS=1: Data
27	/RESET	MPU	Active LOW Reset signal
28	/CS	MPU	Active LOW chip select
A		Power Supply	Power supply for LED Backlight (+3.0V)
K		Power Supply	Ground for Backlight

Recommended LCD connector: 0.8mm pitch pins.

Backlight connector: -- Mates with: --



Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	TOP	Absolute Max	-20	-	+70	°C
Storage Temperature Range	TST	Absolute Max	-30	-	+80	°C
Supply Voltage	VDD		2.9	3.0	-	V
Supply Current	IDD	Ta=25°C VDD=3.0V	-	0.42	0.62	mA
Supply for LCD (contrast)	VDD-V0	Ta=25°C	-	8.8	9.1	V
"H" Level input	Vih		0.2VDD	-	VDD	V
"L" Level input	Vil		Vss	-	0.2VDD	V
"H" Level output	Voh		0.2VDD	-	VDD	V
"L" Level output	Vol		Vss	-	0.2VDD	V

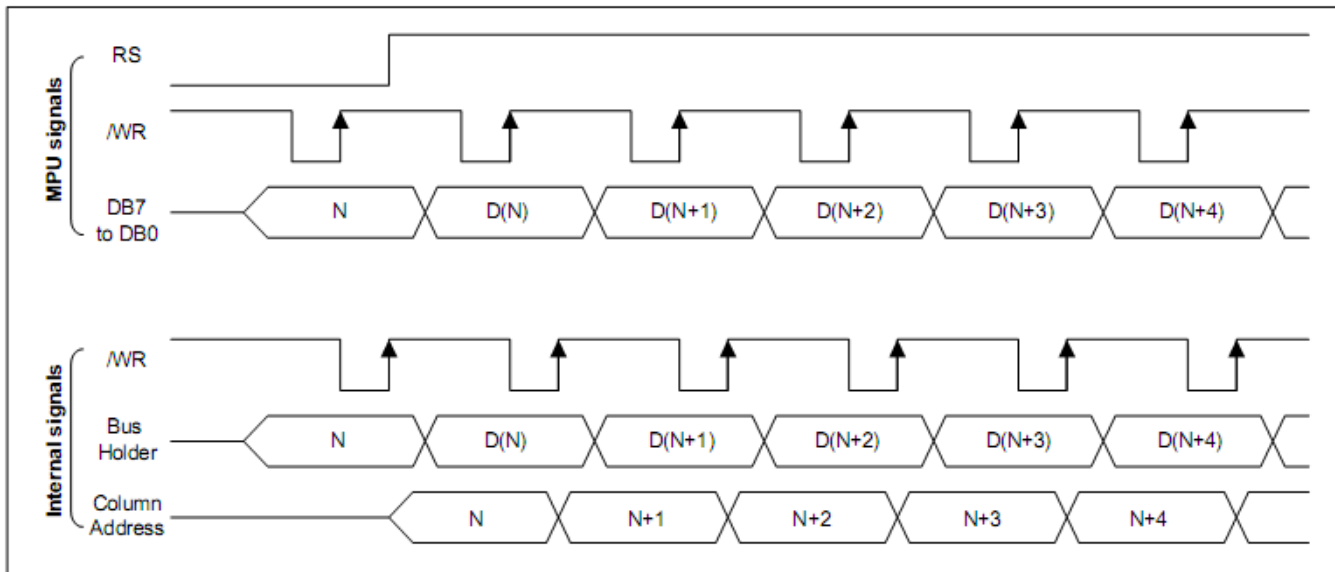
Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle - Vertical	θ	CR ≥ 2	-60	-	+35	°
Viewing Angle - Horizontal	Φ	CR ≥ 2	-40	-	+40	°
Contrast Ratio	CR		-	6	-	-
Response Time (rise)	Tr		-	150	250	ms
Response Time (fall)	Tf		-	150	250	ms

Controller Information

Built-in TL0324S. Download specification at http://www.newhavendisplay.com/app_notes/TL0324S.pdf

Write Timing:



Read Timing:

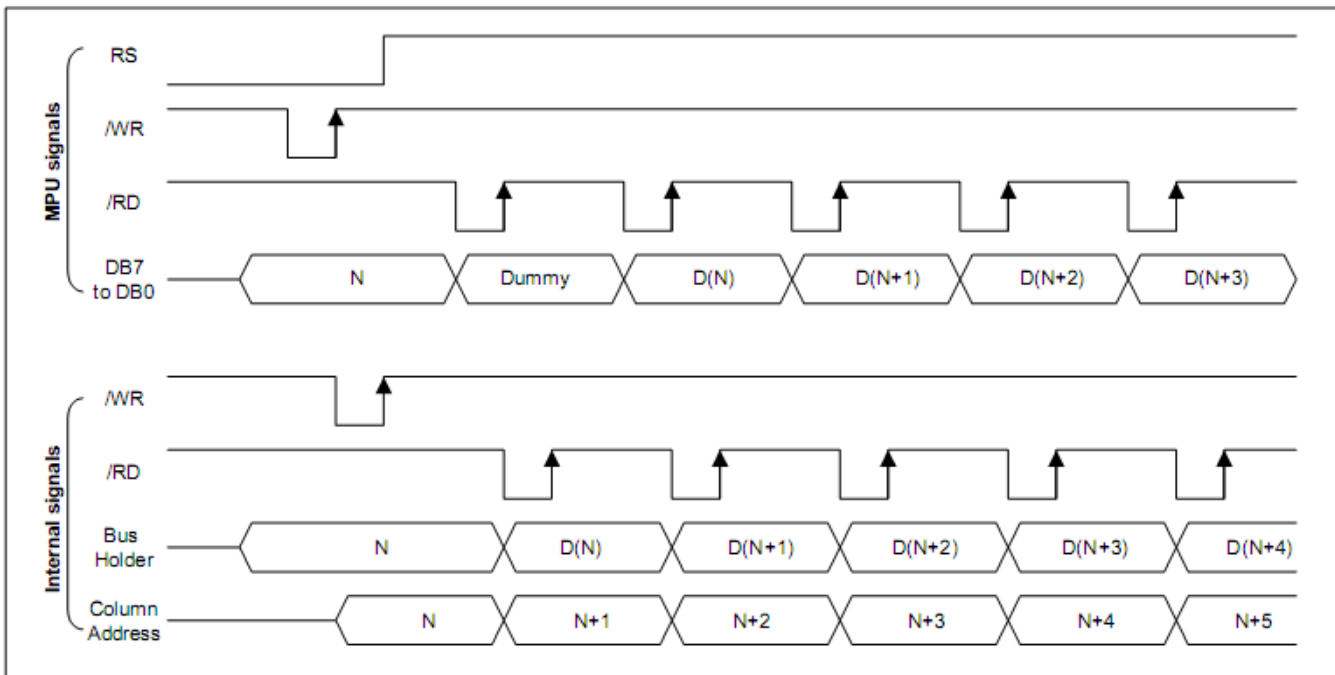


Table of Commands

Instruction	RS	RW	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description
Read display data	1	1	Read data								Read data from DDRAM
Write display data	1	0	Write data								Write data into DDRAM
Read status	0	1	BUSY	ADC	ON / OFF	/RESET	0	0	0	0	Read the internal status
Display ON / OFF	0	0	1	0	1	0	1	1	1	DON	Turn ON / OFF LCD panel When DON = 0 : display OFF When DON=1 : display ON
Initial display line	0	0	0	1	ST5	ST4	ST3	ST2	ST1	ST0	Specify DDRAM line for COM0
Set reference voltage mode	0	0	1	0	0	0	0	0	0	1	Set reference voltage mode
Set reference voltage register	0	0	X	X	SV5	SV4	SV3	SV2	SV1	SV0	Set reference voltage register
Set page address	0	0	1	0	1	1	P3	P2	P1	P0	Set page address
Set column address MSB	0	0	0	0	0	1	Y7	Y6	Y5	Y4	Set column address MSB
Set column address LSB	0	0	0	0	0	0	Y3	Y2	Y1	Y0	Set column address LSB
ADC select	0	0	1	0	1	0	0	0	0	ADC	Select SEG output direction. When ADC = 0 : normal direction (SEG0 ⇒ SEG131) When ADC = 1 : reverse direction (SEG131 ⇒ SEG 0)
Reverse display ON / OFF	0	0	1	0	1	0	0	1	1	REV	Select normal / reverse display When REV = 0 : normal display When REV = 1 : reverse display
Entire display ON / OFF	0	0	1	0	1	0	0	1	0	EON	Select normal / entire display ON When EON = 0 : normal display When EON = 1 : entire display ON
LCD bias select	0	0	1	0	1	0	0	0	1	BIAS	Select LCD bias
Set modify-read	0	0	1	1	1	0	0	0	0	0	Set modify-read mode
Reset modify-read	0	0	1	1	1	0	1	1	1	0	Release modify-read mode
Reset	0	0	1	1	1	0	0	0	1	0	Initialize the internal function
SHL select	0	0	1	1	0	0	SHL	X	X	X	Select COM output direction When SHL = 0 : normal direction (COM0 ⇒ COM63) When SHL = 1 : reverse direction (COM63 ⇒ COM0)
Power control	0	0	0	0	1	0	1	VC	VR	VF	Control power circuit operation
Select Regulator Resistor	0	0	0	0	1	0	0	R2	R1	R0	Select internal resistance ratio of the regulator resistor
Set static indicator mode	0	0	1	0	1	0	1	1	0	SM	Set static indicator mode
Set static indicator register	0	0	X	X	X	X	X	X	S1	S0	Set static indicator register
Power save	-	-	-	-	-	-	-	-	-	-	Compound instruction of display OFF and entire display ON
NOP	0	0	1	1	1	0	0	0	1	1	<u>Non-Operation command</u>
Test Instruction_1	0	0	1	1	1	1	X	X	X	X	<u>Don't use this instruction</u>
Test Instruction_2	0	0	1	0	0	1	X	X	X	X	<u>Don't use this instruction</u>

Quality Information

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	+60°C , 48hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-10°C , 48hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time.	+70°C 48hrs	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C , 48hrs	1,2
High Temperature / Humidity Operation	Endurance test applying the electric stress (voltage & current) and the high thermal with high humidity stress for a long time.	+40°C , 90% RH , 48hrs	1,2
Thermal Shock resistance	Endurance test applying the electric stress (voltage & current) during a cycle of low and high thermal stress.	-0°C,30min -> 25°C,5min -> 50°C,30min = 1 cycle 10 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-55Hz , 15mm amplitude. 60 sec in each of 3 directions X,Y,Z For 15 minutes	3
Static electricity test	Endurance test applying electric static discharge.	VS=800V, RS=1.5kΩ, CS=100pF One time	

Note 1: No condensation to be observed.

Note 2: Conducted after 4 hours of storage at 25°C, 0%RH.

Note 3: Test performed on product itself, not inside a container.

Precautions for using LCDs/LCMs

See Precautions at www.newhavendisplay.com/specs/precautions.pdf

Warranty Information and Terms & Conditions

http://www.newhavendisplay.com/index.php?main_page=terms