NHD-12864AZ-FSW-GBW-VZ

Graphic Liquid Crystal Display Module

NHD-	Newhaven Display
12864-	128 x 64 pixels
AZ-	Model
F-	Transflective
SW-	Side White LED backlight
G-	STN- Gray
B-	6:00 View
W-	Wide Temperature (-20°C ~ +70°C)
VZ-	With Built-in Negative Voltage Supply
	RoHS Compliant-8.8

Newhaven Display International, Inc.

2511 Technology Drive, Suite 101

Elgin IL, 60124

Ph: 847-844-8795 Fax: 847-844-8796

www.newhavendisplay.com

nhtech@newhavendisplay.com nhsales@newhavendisplay.com

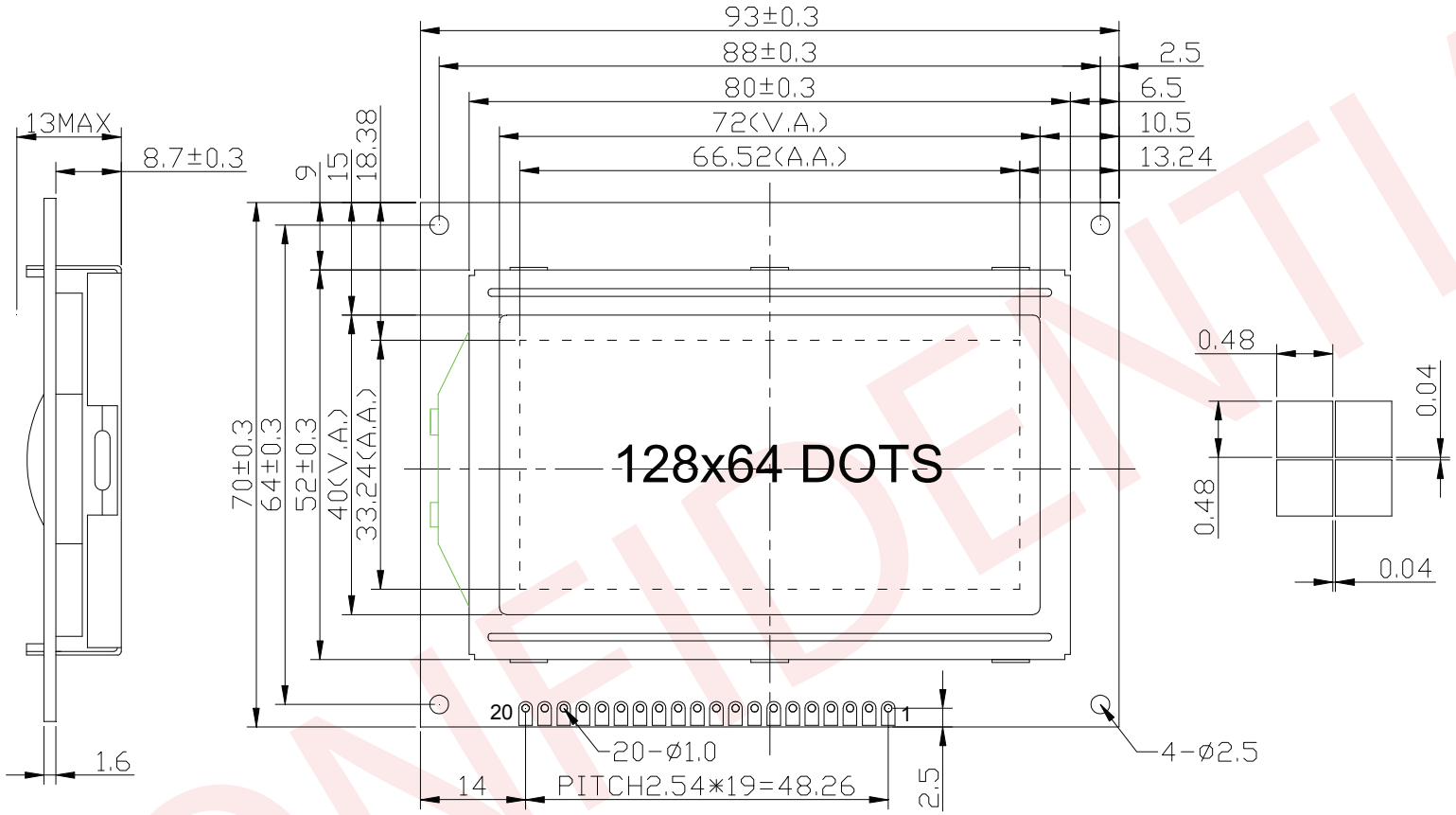
Document Revision History

Revision	Date	Description	Changed by
0	11/15/2008	Initial Release	-
1	4/2/2010	User guide reformat	BE
2	5/6/2010	Block diagram/initialization updated	BE
3	1/21/2011	Update Electrical Characteristics	JT
4	12/17/2012	Controller information updated	AK

Functions and Features

- **128x64 pixels**
- **Built-in NT7108C controller**
- **+5.0V power supply**
- **1/64 duty, 1/9 bias**
- **RoHS Compliant**

Mechanical Drawing



PIN ASSIGNMENT

1	VSS
2	VDD
3	V0
4	RS
5	R/W
6	E
7~14	DB0~DB7
15	CS1B
16	CS2B
17	/RST
18	VEE
19	LED+
20	LED-

Notes:

1). Driver Method: 1/64duty, 1/9bias, VDD5.0V VLCD8.7V
2). Display Type: STN-Gray/Positive/Transflective/6:00 Visual Angle
3). Operating Temp: -20°C~70°C/Storage Temp: -30°C~80°C
4). Backlight Type: Edge/White/Vled5.0V
5). Driver: NT7108C 8bit MPU
6). RoHS Compliant

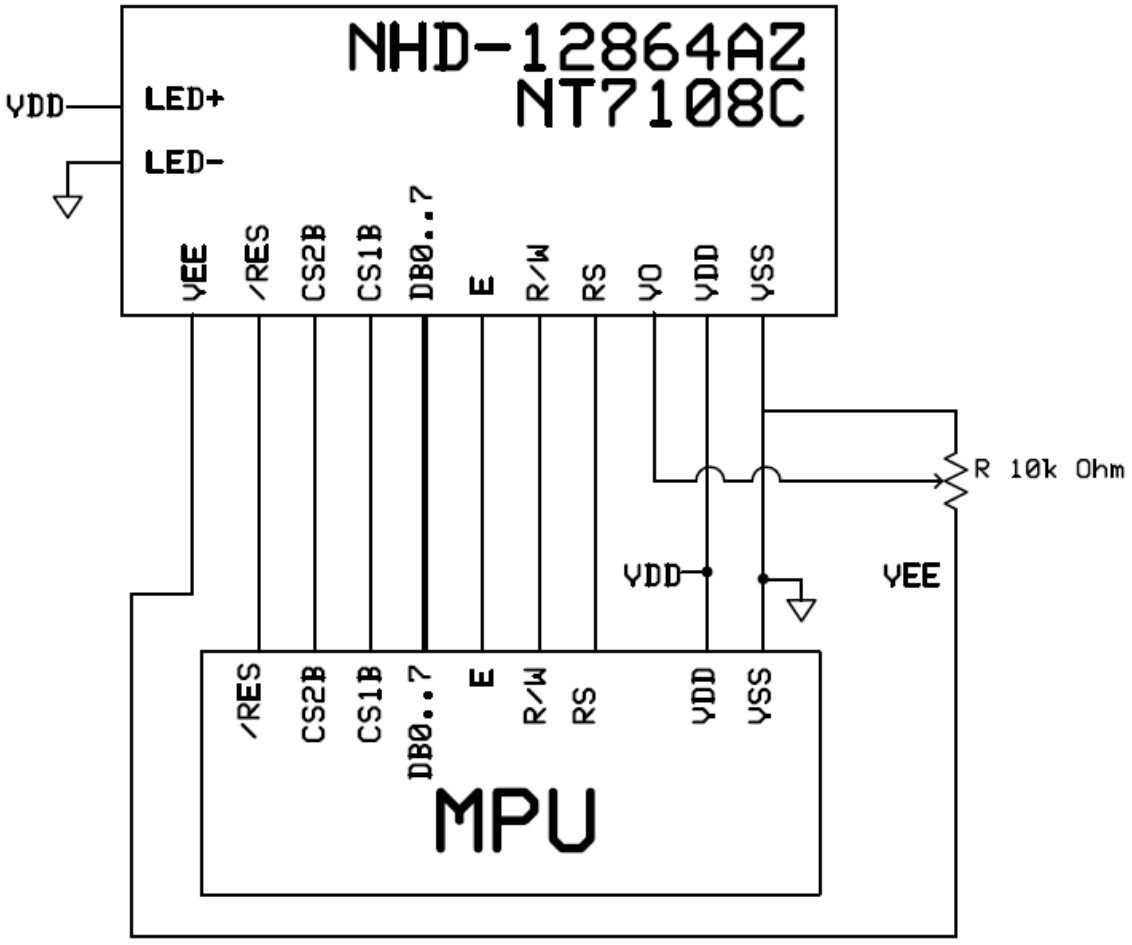
Rev	Description	Date

	Date	
	12/17/12	NEWHAVEN DISPLAY INTERNATIONAL
Gen. Tolerance ±0.3mm	Unit mm	Model: NHD-12864AZ-FSW-GBW-VZ

Pin Description and Wiring Diagram

Pin No.	Symbol	External Connection	Function Description
1	VSS	Power Supply	Ground
2	VDD	Power Supply	Power supply for Logic (+5.0V)
3	V0	Adj Power Supply	Power Supply for contrast (approx. -8.8V)
4	RS	MPU	Register select: 1=Data, 0=Instruction
5	R/W	MPU	Read/Write select signal, R/W=1: Read R/W: =0: Write
6	E	MPU	Operation enable signal. Falling edge triggered.
7-14	DB0-DB7	MPU	This is an 8-bit Bi-directional data bus
15	CS1B	MPU	Chip Selection: CS1=H, CS2=L → select IC1 (left side)
16	CS2B	MPU	CS1=L, CS2=H → select IC2 (right side)
17	/RES	MPU	Active LOW Reset signal
18	VEE	Power Supply	Negative voltage output (-10V)
19	LED+	Power Supply	Power for LED backlight (+5.0V via on-board resistor)
20	LED-	Power Supply	Ground for Backlight

Recommended LCD connector: 2.54mm pitch pins
Backlight connector: ----



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		4.7	5.0	5.5	V
Supply Current	IDD	Ta=25°, VDD=5.0V	-	3.5	4.5	mA
Supply for LCD (contrast)	VDD-V0	Ta=25°		8.7	9.0	V
"H" Level input	Vih		0.7*VDD	-	VDD	V
"L" Level input	Vil		0	-	0.3*VDD	V
"H" Level output	Voh		2.4	-	-	V
"L" Level output	Vol		-	-	0.4	V
Backlight Supply Voltage	Vled		-	5.0	-	V
Backlight Supply Current	Iled	Vled=5.0V, R=68Ω	-	30	50	mA

Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle – Top		Cr ≥ 2	-	35	-	°
Viewing Angle – Bottom			-	60	-	°
Viewing Angle – Left			-	40	-	°
Viewing Angle – Right			-	40	-	°
Contrast Ratio	Cr		3	5	-	
Response Time (rise)	Tr		-	150	250	ms
Response Time (fall)	Tf		-	200	300	ms

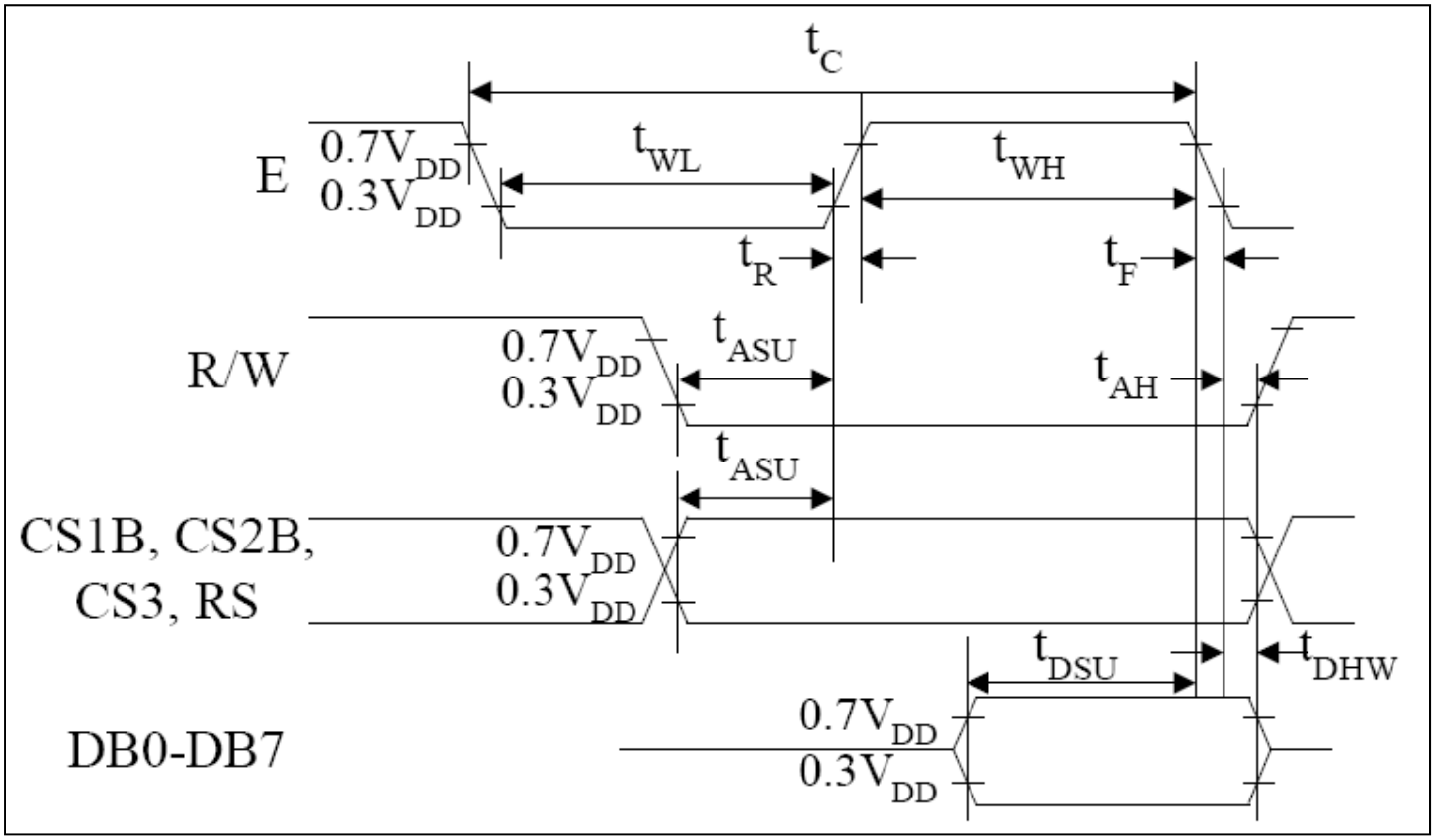
Controller Information

Built-in NT7108C controller.
Please download specification at http://www.newhavendisplay.com/app_notes/NT7108.pdf

Table of Commands

Instruction	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function
Display on/off	L	L	L	L	H	H	H	H	H	L/H	Controls the display on or off. Internal status and display RAM data is not affected. L:OFF, H:ON
Set address (Y address)	L	L	L	H	Y address (0-63)						Sets the Y address in the Y address counter.
Set page (X address)	L	L	H	L	H	H	H	Page (0-7)			Sets the X address at the X address register.
Display Start line (Z address)	L	L	H	H	Display start line (0-63)						Indicates the display data RAM displayed at the top of the screen.
Status read	L	H	Busy	L	On/ Off	Reset	L	L	L	L	Read status. BUSY L: Ready H: In operation ON/OFF L: Display ON H: Display OFF RESET L: Normal H: Reset
Write display data	H	L	Write data								Writes data (DB0: 7) into display data RAM. After writing instruction, Y address is increased by 1 automatically.
Read display data	H	H	Read data								Reads data (DB0: 7) from display data RAM to the data bus.

Timing Characteristics



Characteristic	Symbol	Min	Type	Max	Unit
E cycle	t_C	1000	-	-	ns
E high level width	t_{WH}	450	-	-	
E low level width	t_{WL}	450	-	-	
E rise time	t_R	-	-	25	
E fall time	t_F	-	-	25	
Address set-up time	t_{ASU}	140	-	-	
Address hold time	t_{AH}	10	-	-	
Data set-up time	t_{DSU}	200	-	-	
Data delay time	t_D	-	-	320	
Data hold time (write)	t_{DHW}	10	-	-	
Data hold time (read)	t_{DHR}	20	-	-	

Example Initialization Program

```
'-------------------------------------------------------------------------------
'DB0-DB7   7-14              P1
'CS2       16                P3.6
'CS1       15                P3.1
'RST       17                P3.2
'R/W       5                 P3.7
'D/I       4                 P3.0
'E         6                 P3.4
'-------------------------------------------------------------------------------
Sub Init
 Reset P3.2
 Set P3.2
 Reset P3.4
 Reset P3.0
 Reset P3.7
 Reset P3.6
 Reset P3.1
 A = &H3F
 Call Comleft                                              'display on
 Call Comright                                             'display on
End Sub
'-------------------------------------------------------------------------------
Sub Comleft
 P1 = A
 Set P3.6
 Reset P3.0
 Set P3.4
 Reset P3.4
 Reset P3.6
End Sub

Sub Comright
 P1 = A
 Set P3.1
 Reset P3.0
 Set P3.4
 Reset P3.4
 Reset P3.1
End Sub

Sub Writeleft
 P1 = A
 Set P3.6
 Set P3.0
 Set P3.4
 Reset P3.4
 Reset P3.6
End Sub

Sub Writeright
 P1 = A
 Set P3.1
 Set P3.0
 Set P3.4
 Reset P3.4
 Reset P3.1
End Sub
```

Quality Information

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	+80°C , 48hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°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

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru