

NHD-1.45-Breakout

Breakout Board for 1.45" Color OLED Glass

NHD- Newhaven Display
1.45- 1.45" Diagonal Size
Breakout- Breakout Board

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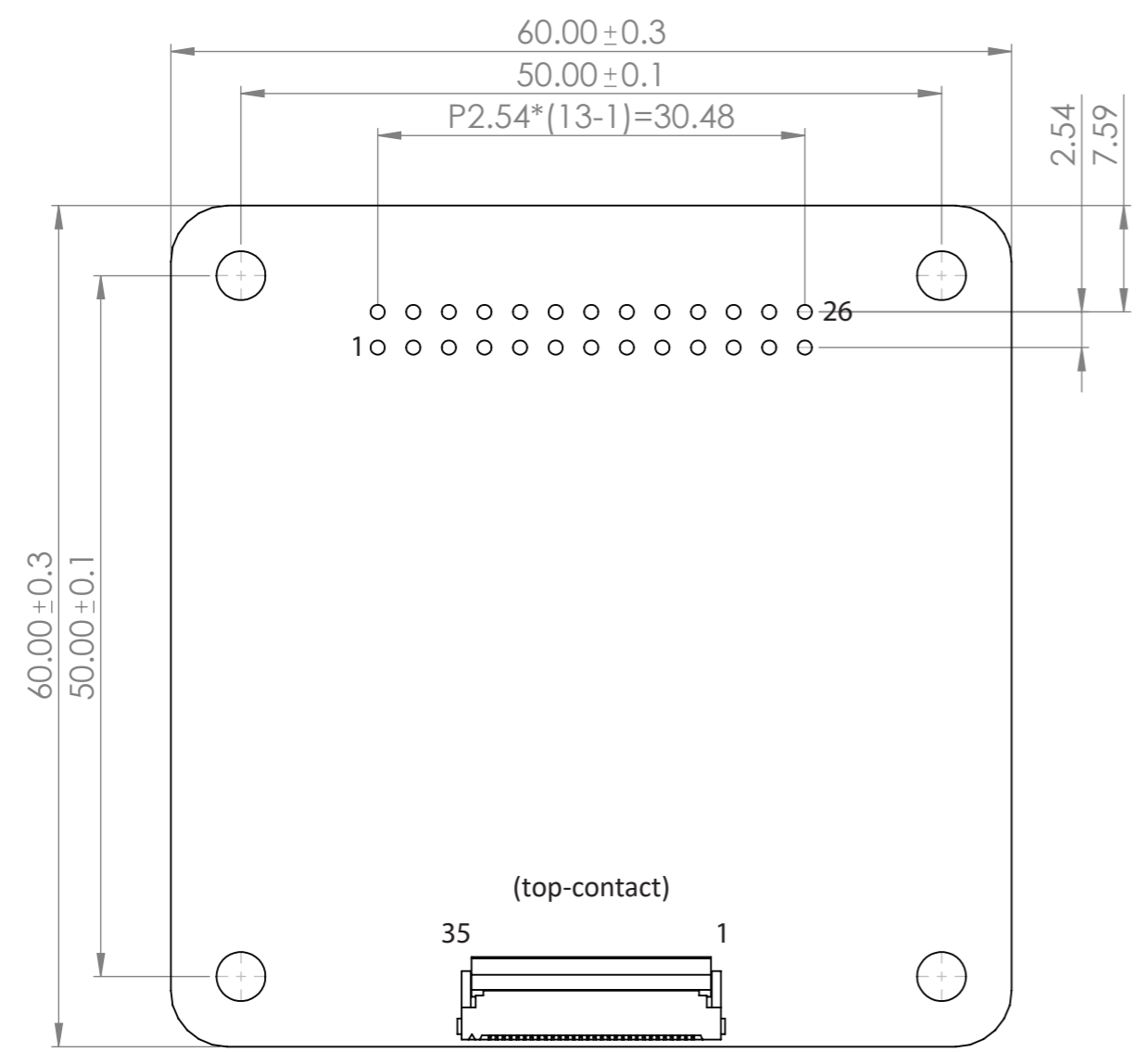
Document Revision History

Revision	Date	Description	Changed by
-	09/18/19	Initial Release	PB

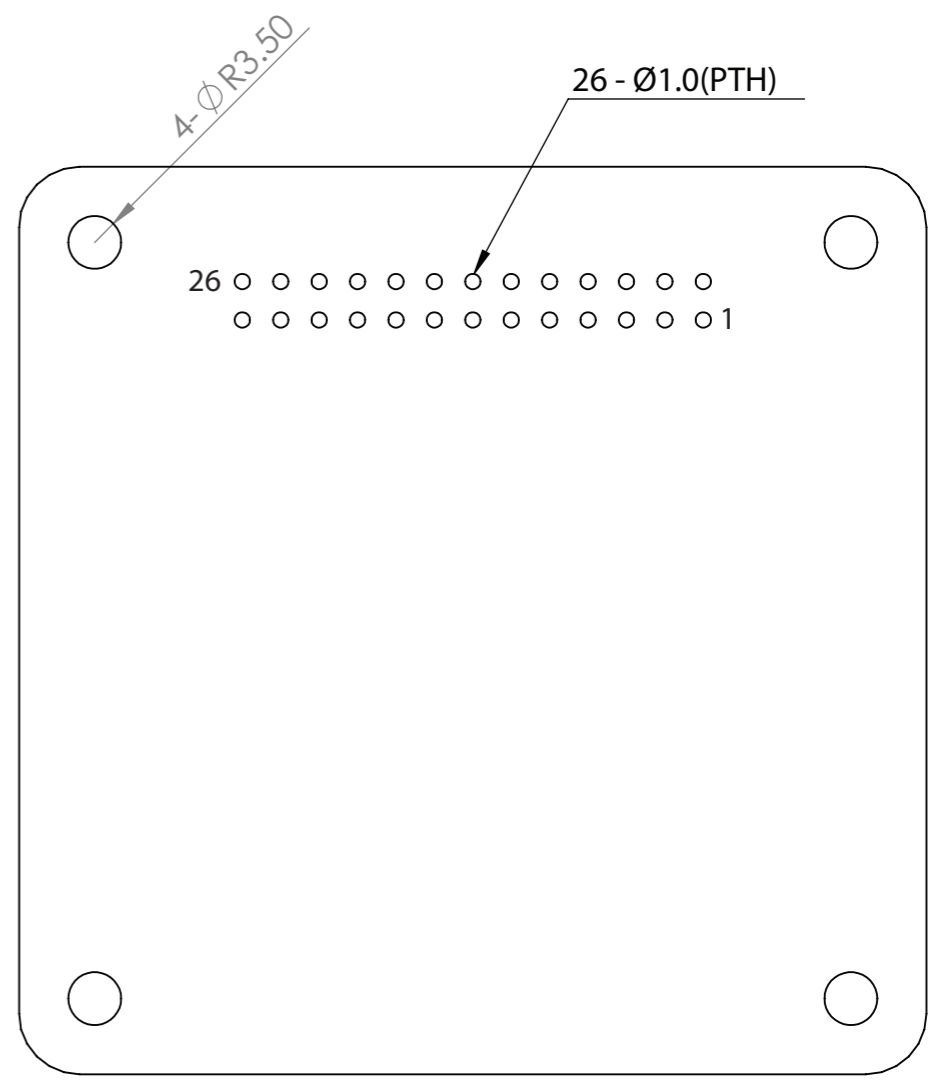
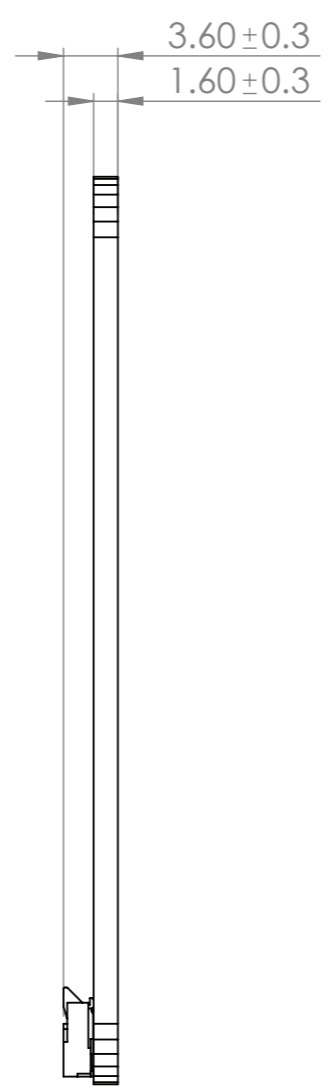
Functions and Features

- Breakout board for 1.45" Color OLED Glass (NHD-1.45-160128G)
- On-board booster circuit (FAN5331SX)
- Jumper option to bypass booster circuit and provide V_{CC} directly
- Open source hardware



1	2	3	4	5	6	7	8	
				SYMBOL	REVISION			DATE

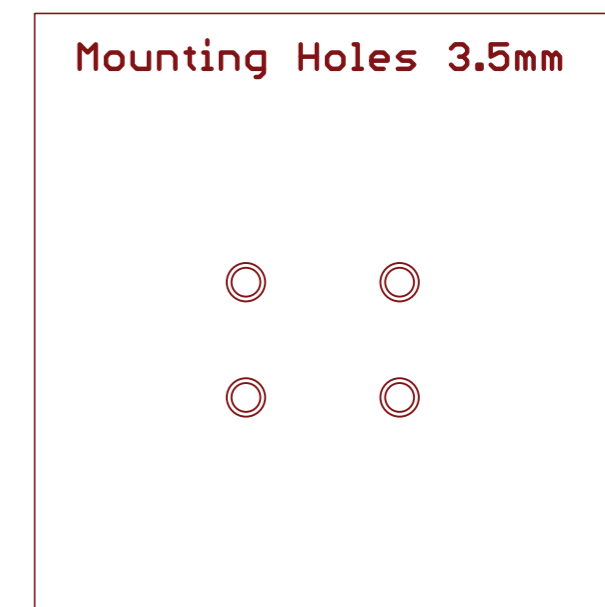
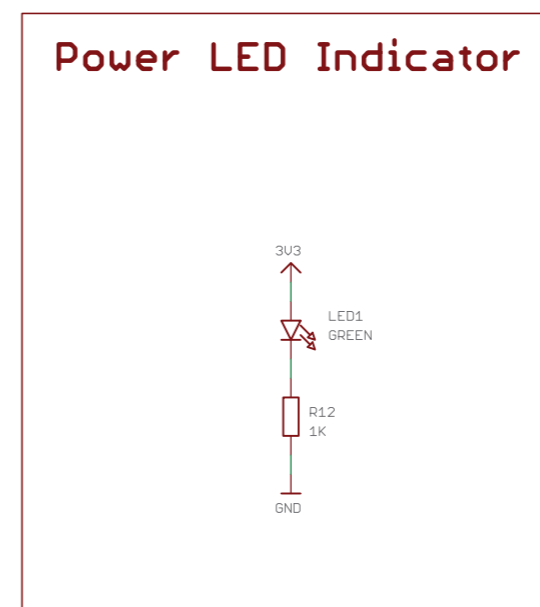
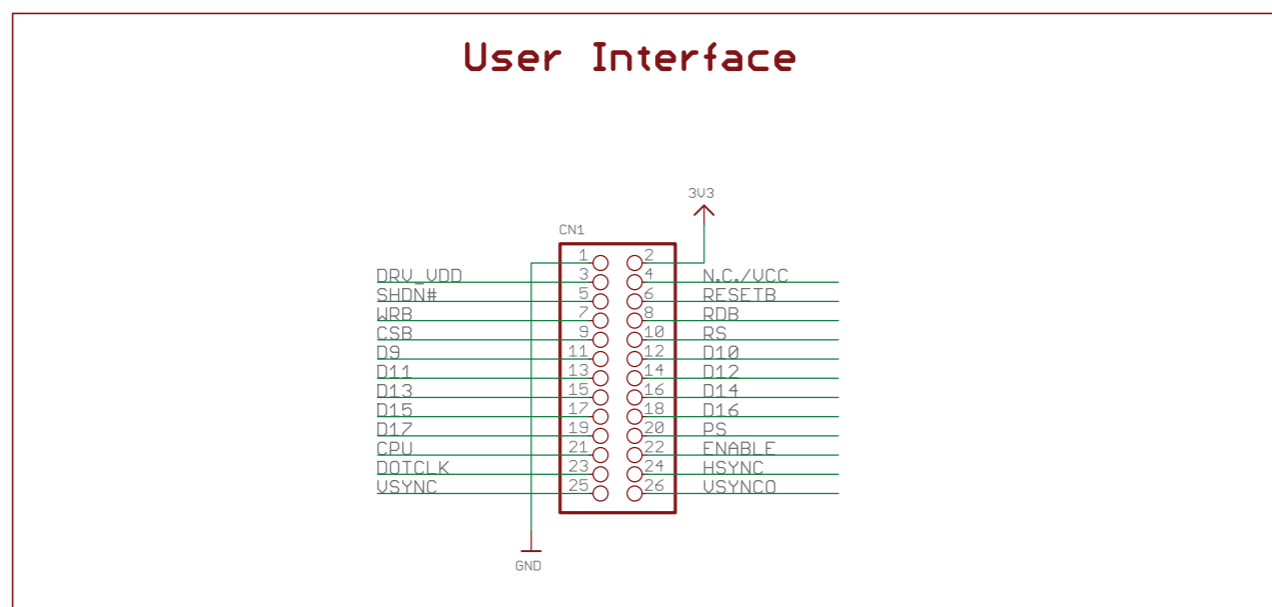
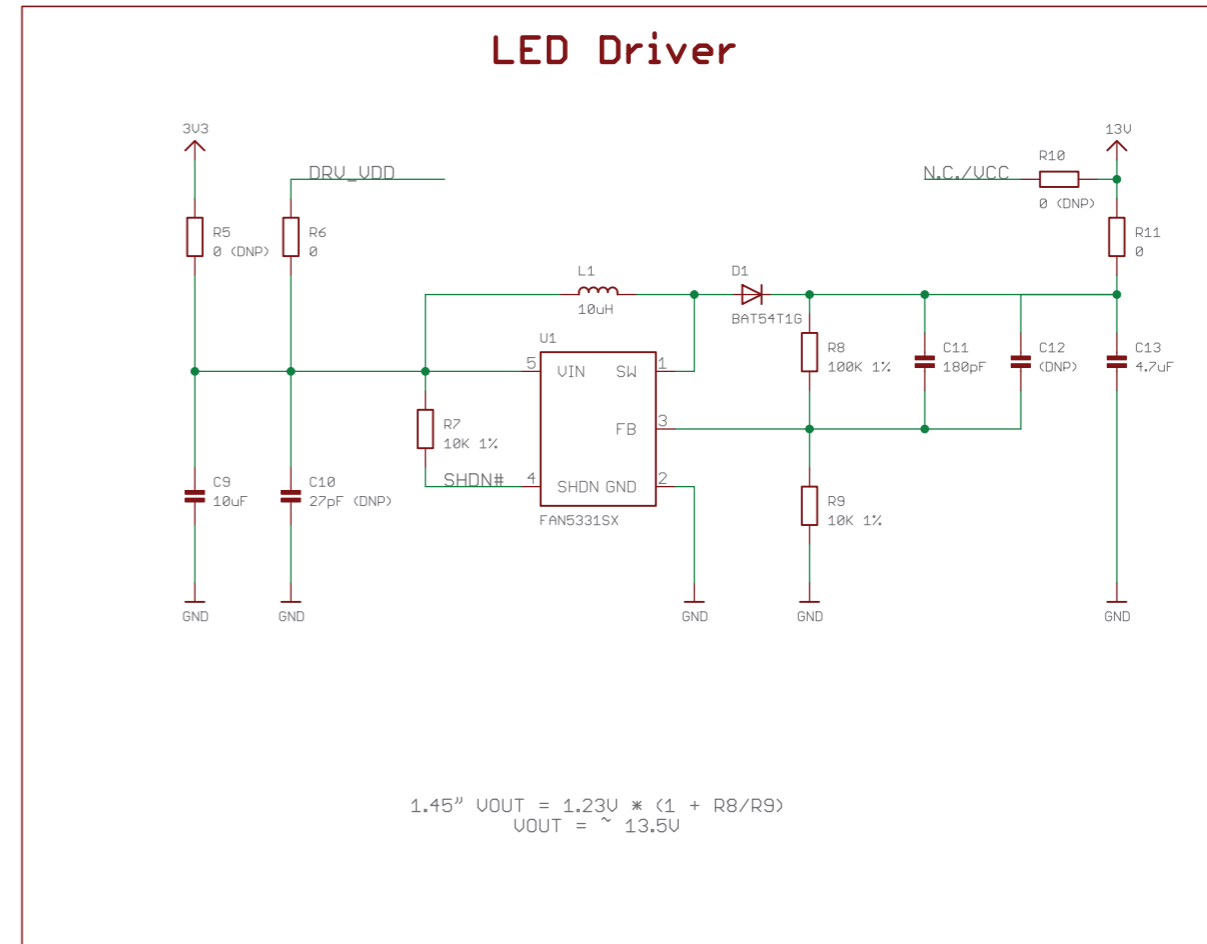
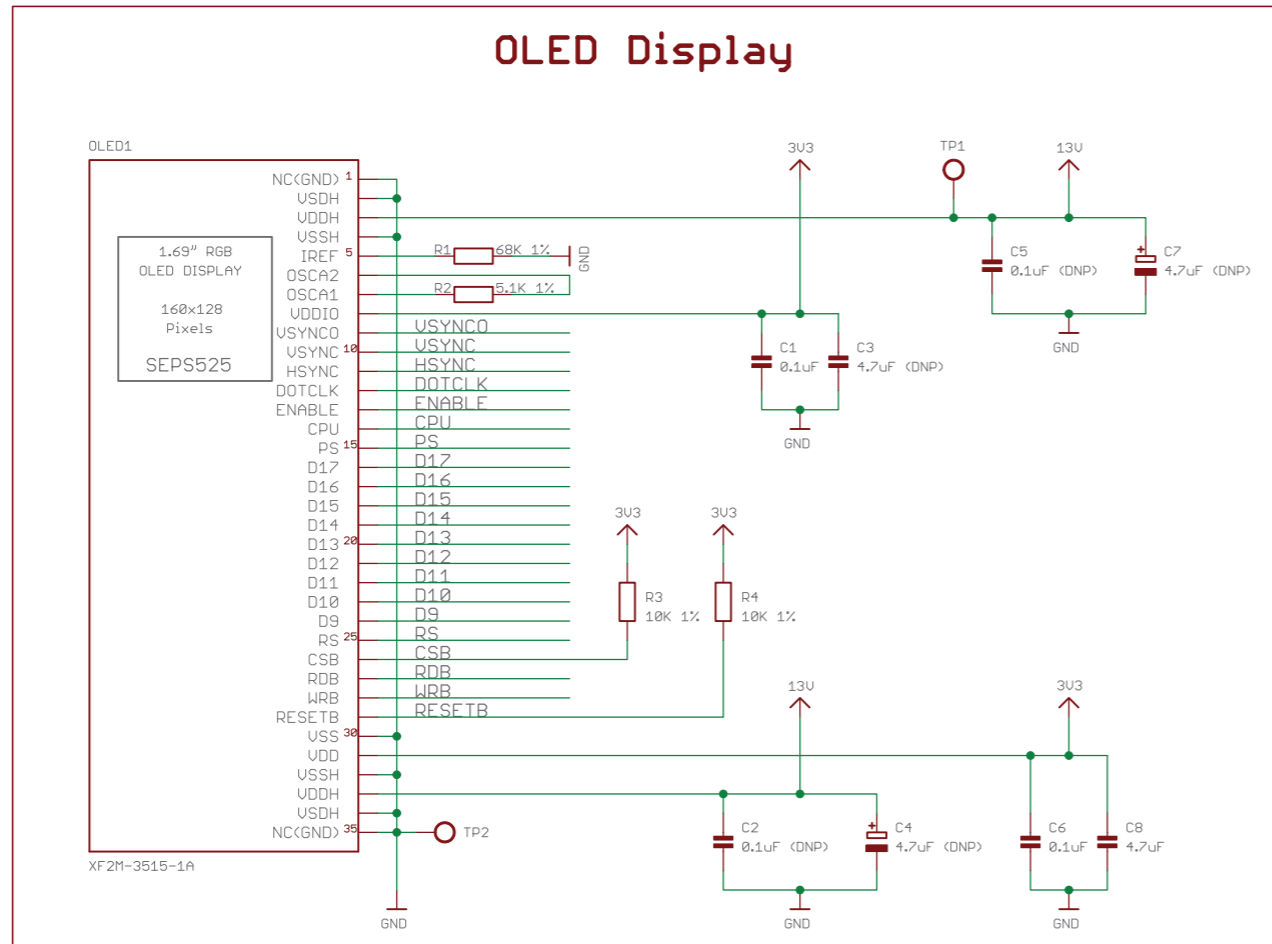



[read caution below]



 OLED Panel must be connected with gold fingers **facing upward** (top-contact), for the display to operate and not be damaged.

STANDARD TOLERANCE: (UNLESS OTHERWISE SPECIFIED)		
LINEAR: ±0.3mm	DRAWING/PART NUMBER: NHD-1.45-Breakout	REVISION: -
UNLESS OTHERWISE SPECIFIED:	DRAWN BY: P. Bartek	APPROVED BY: P. Bartek
- DIMENSIONS ARE IN MILLIMETERS	DRAWN DATE: 09/17/19	APPROVED DATE: 09/17/19
- THIRD ANGLE PROJECTION 	DO NOT SCALE DRAWING	
	SHEET 1 OF 1	
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NEWHAVEN DISPLAY
INTERNATIONAL

SCHEMATIC / PART NUMBER:		REVISION:
NHD-1.45-Breakout		1B
		SIZE:
		A3
DRAWN BY:	CHECKED BY:	SHEET:
P. Bartek	P. Bartek	1 of 1
DRAWN DATE:	CHECKED DATE:	
08/07/19	08/07/19	
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Pin Description

Pin No.	Symbol	External Connection	Function Description
1	GND	Power Supply	Ground
2	3V3	Power Supply	Supply Voltage for OLED Logic (+3.3V)
3	DRV_VDD	Power Supply	Supply Voltage for boost converter (+5V) to drive OLED panel voltage (VCC). (Should be no connect if using pin 4 to apply external VCC)
4	N.C./VCC	-	No Connect by default. Can be configured for external VCC (+13V). (refer to On-Board Jumper Options table below)
5	SHDN#	MPU	Active LOW Shutdown control pin for boost converter (pulled HIGH via on-board 10kΩ resistor)
6	RESETB		Active LOW Reset signal
7	WRB		6800 mode: Read/Write signal. LOW: Read. HIGH: Write 8080 mode: Active LOW Write signal
8	RDB		6800 mode: Enable signal. Falling edge triggered 8080 mode: Active LOW Read signal
9	CSB		Active LOW Chip Select signal
10	RS		Register Select signal. LOW: Command. HIGH: Data
11-19	D9-D17	MPU	Parallel interface: 9-bit Bi-directional data bus (D17~D9) 8-bit Bi-directional data bus (D17~D10) Serial Interface: D17: Synchronous Clock signal (SCL) D16: Serial Data Input signal (SDI) D15: Serial Data Output signal (SDO) RGB interface: 6-bit RGB color signals (D17~D12)
20	PS	MPU	Parallel/Serial select. HIGH: Parallel. LOW: Serial
21	CPU	MPU	Interface select. HIGH: 6800 interface. LOW: 8080 interface
22	ENABLE	MPU	Data Enable signal
23	DOTCLK	MPU	Dot Clock signal
24	HSYNC	MPU	Horizontal Sync signal
25	VSYNC	MPU	Vertical Sync signal
26	N.C.	-	No Connect

MPU Interface Pin Assignment Summary

EIM=1 (Default)

Bus Interface	PS	CPU	DFM1	DFM0	D17	D16	D15	D14	D13	D12	D11	D10	D9	RS	CSB	RDB	WRB	RESETB
4-wire SPI	0	X	X	X	SCL	SDI	NC	0	0	0	0	0	0	RS	CSB	0	0	RESETB
9-bit 8080	1	0	1	0	D8	D7	D6	D5	D4	D3	D2	D1	D0	RS	CSB	RDB	WRB	RESETB
8-bit 8080	1	0	1	1	D7	D6	D5	D4	D3	D2	D1	D0	0	RS	CSB	RDB	WRB	RESETB
9-bit 6800	1	1	1	0	D8	D7	D6	D5	D4	D3	D2	D1	D0	RS	CSB	E	R/W	RESETB
8-bit 6800	1	1	1	1	D7	D6	D5	D4	D3	D2	D1	D0	0	RS	CSB	E	R/W	RESETB

EIM=0

Bus Interface	RIM1	RIM0	D17	D16	D15	D14	D13	D12	D11	D10	D9	VSYNC	HSYNC	DOTCLK	ENABLE
6-bit RGB	1	0	D5	D4	D3	D2	D1	D0	0	0	0	VSYNC	HSYNC	DOTCLK	ENABLE

Note:

- DFM1, DFM0 register setting 16h
- EIM, RIM1, RIM0 register setting 14h
- "X" : Don't care
 "NC" : No Connect
 "1" : VDD
 "0" : VSS

On-Board Jumper Options

Default Jumper Setting

R10	R11	Description
Open	Close	(default) Boost converter circuit (+5V on pin 3) is used to provide VCC to OLED Glass.

Jumper Option #1 – External Supply Voltage for OLED Panel (VCC)

R10	R11	Description
Close	Open	Boost converter circuit (pin 3) is not used. User must apply VCC (+13V) externally to (pin 4). OLED logic is still powered from 3V3 (pin 2). This method allows for minimum current drain.

Default Jumper Setting



Jumper Option #1



Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	T _{OP}	Absolute Max	-40	-	+70	°C
Storage Temperature Range	T _{ST}	Absolute Max	-40	-	+85	°C
Supply Voltage for OLED Logic	3V3	-	2.8	3.0	3.3	V
Supply Voltage for Boost Circuit	DRV_VDD	-	-	5.0	5.5	V
Supply Voltage for OLED Panel	V _{CC}	-	12.5	13.0	13.5	V

NOTICE: It is not recommended to apply power to the board without a display connected. Doing so may result in a damaged booster circuit. Newhaven Display does not assume responsibility for PCB failures due to this damage.

Compatible OLED Glass

This board is designed to drive and breakout the signals of the NHD-1.45-160128G.

Please download specification at <http://www.newhavendisplay.com/specs/NHD-1.45-160128G.pdf>

Quality Information

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Test the endurance of the display at high storage temperature.	+85°C, 240 Hrs.	2
Low Temperature storage	Test the endurance of the display at low storage temperature.	-40°C, 240 Hrs.	1,2
High Temperature Operation	Test the endurance of the display by applying electric stress (voltage & current) at high temperature.	+70°C, 240 Hrs.	2
Low Temperature Operation	Test the endurance of the display by applying electric stress (voltage & current) at low temperature.	-40°C, 240 Hrs.	1,2
High Temperature / Humidity Operation	Test the endurance of the display by applying electric stress (voltage & current) at high temperature with high humidity.	+60°C, 90% RH, 120 Hrs.	1,2

Note 1: No condensation to be observed.

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

Precautions for using OLEDs/LCDs/LCMs

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

Warranty Information

See Terms & Conditions at http://www.newhavendisplay.com/index.php?main_page=terms