

# NHD-1.5-Breakout

## Breakout Board for 1.5" Color OLED Glass

NHD-	Newhaven Display
1.5-	1.5" Diagonal Size
Breakout-	Breakout Board

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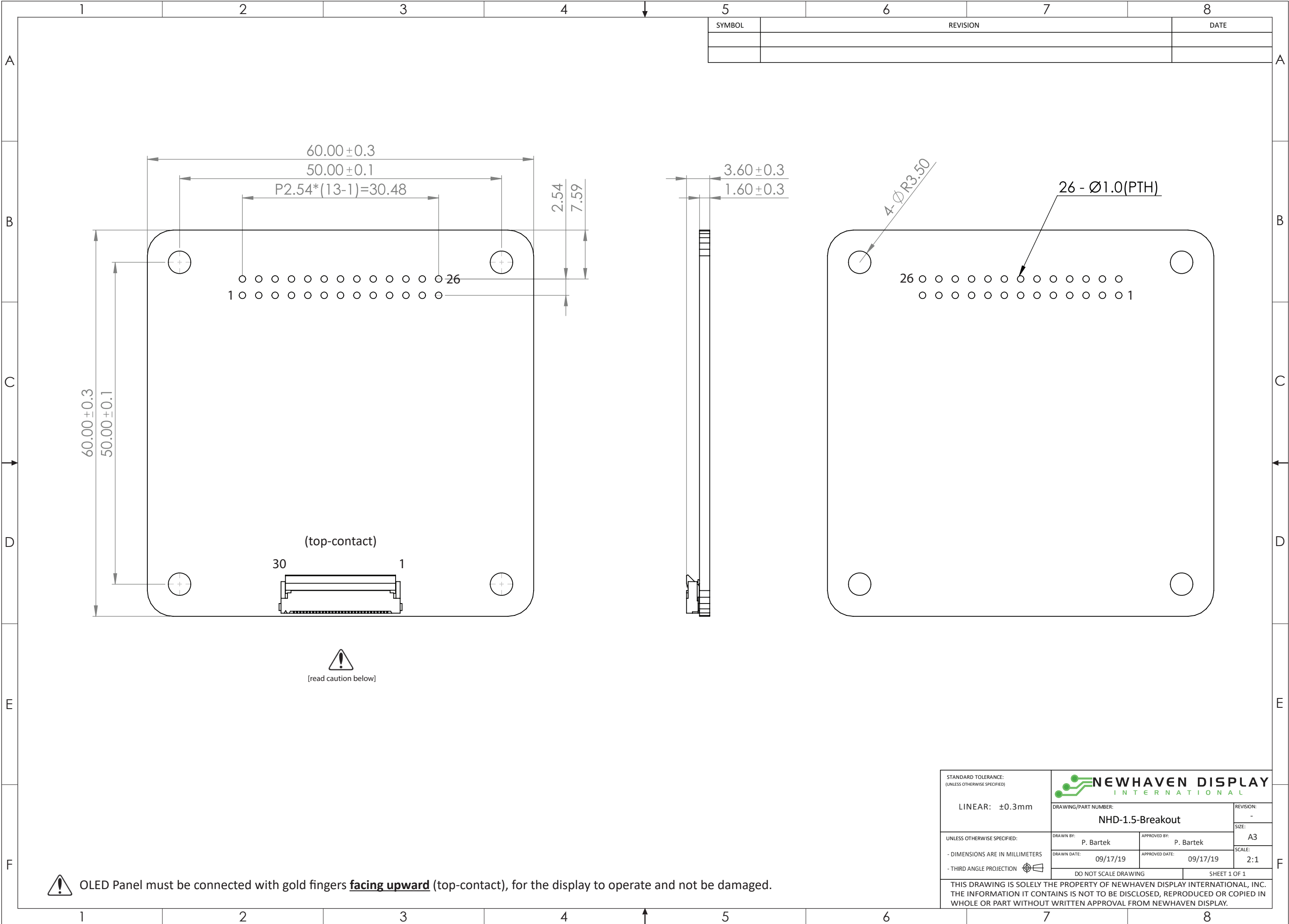
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## Document Revision History



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

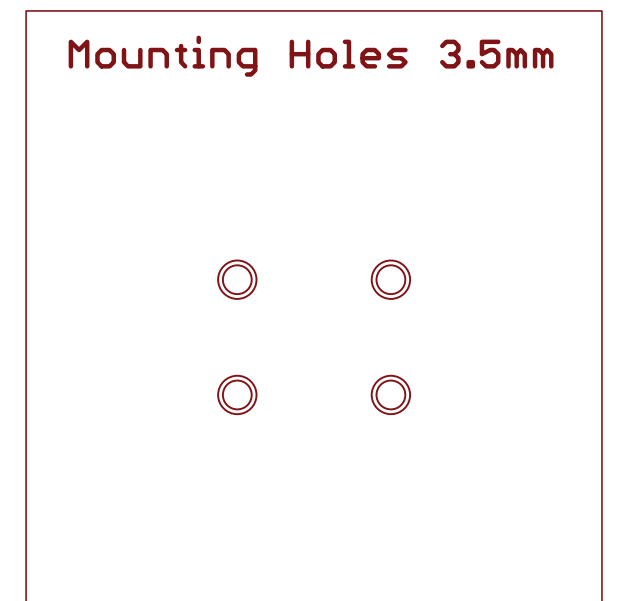
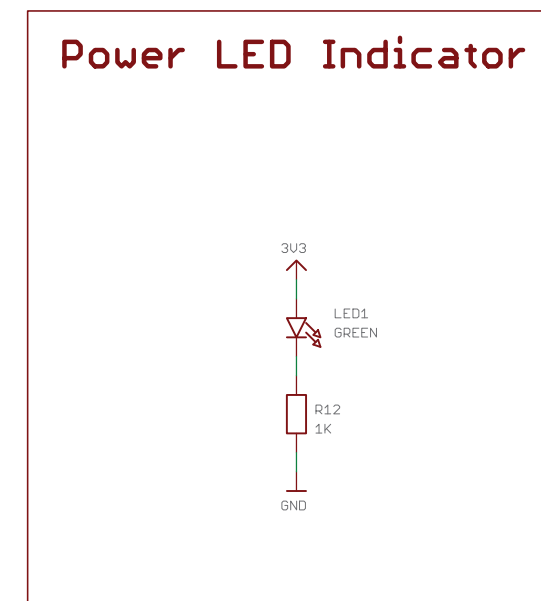
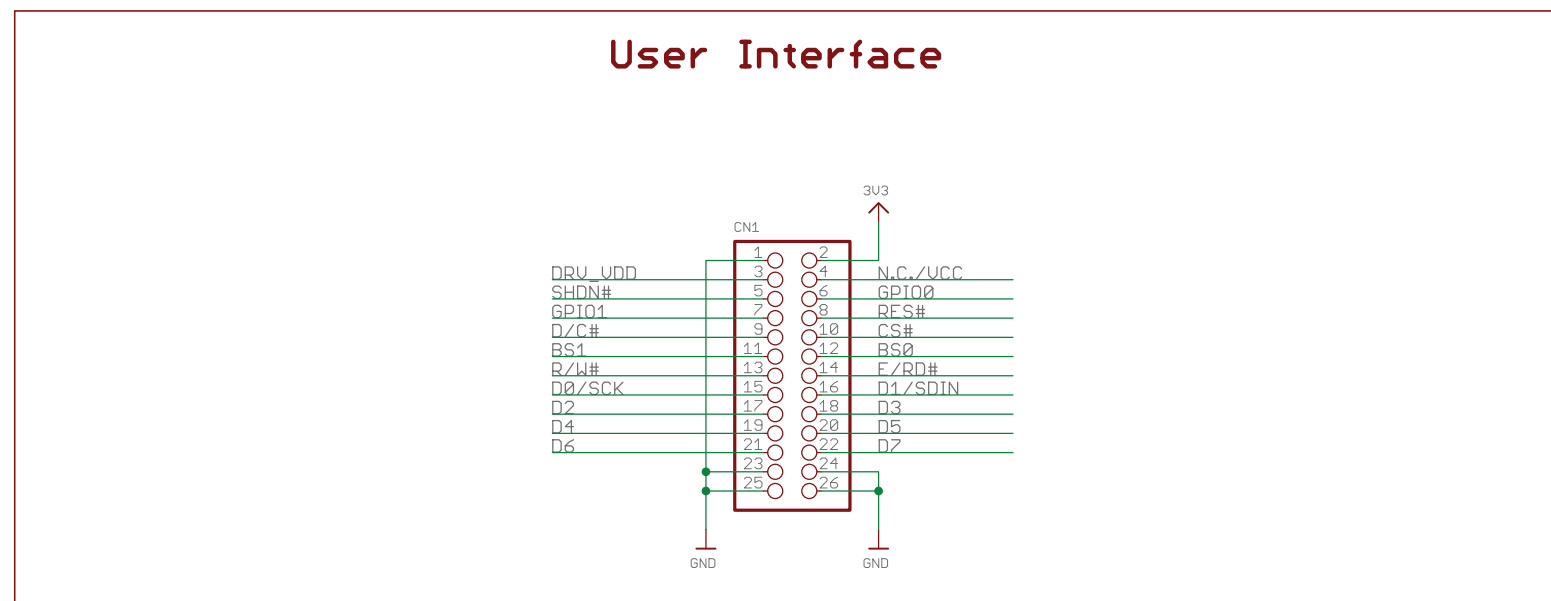
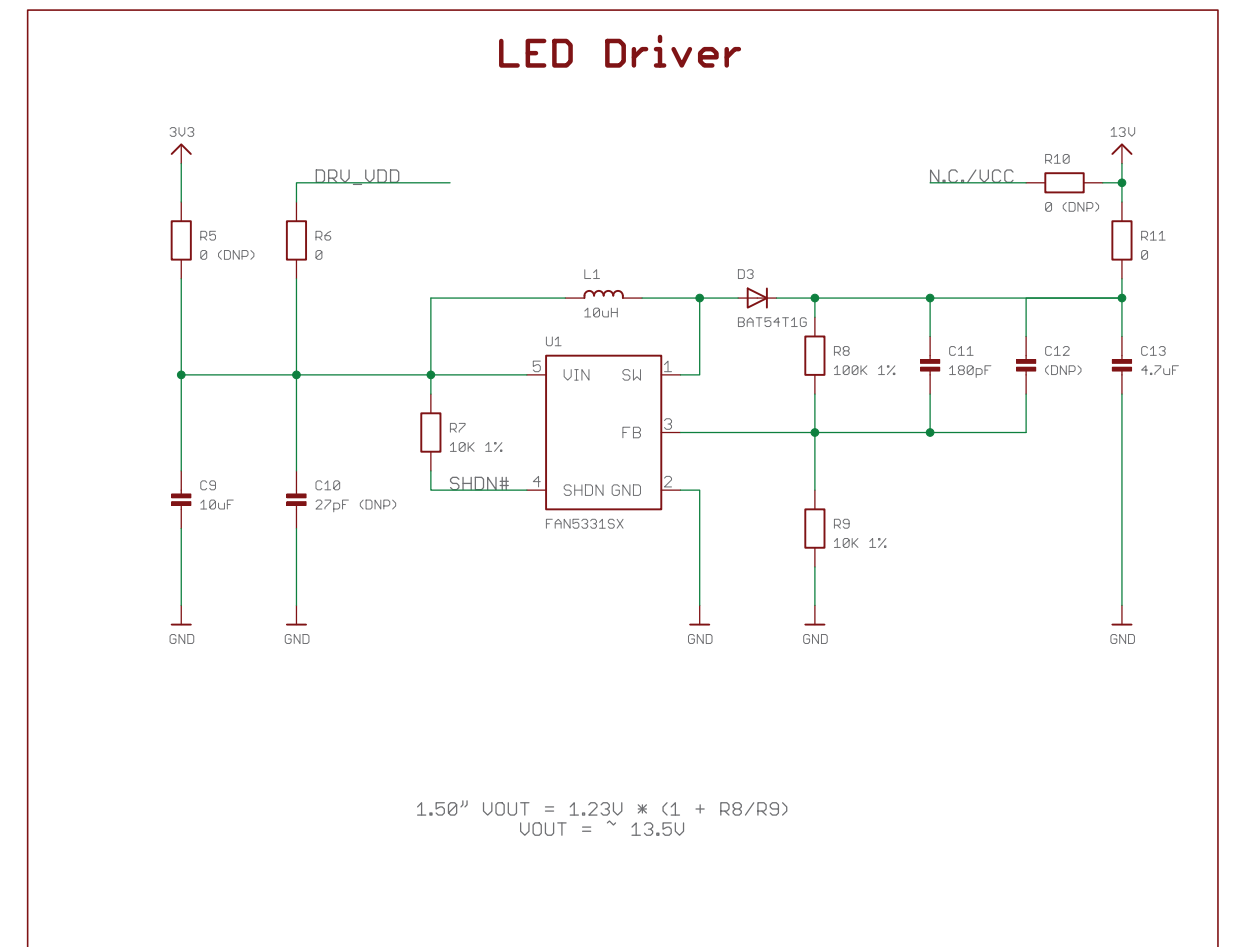
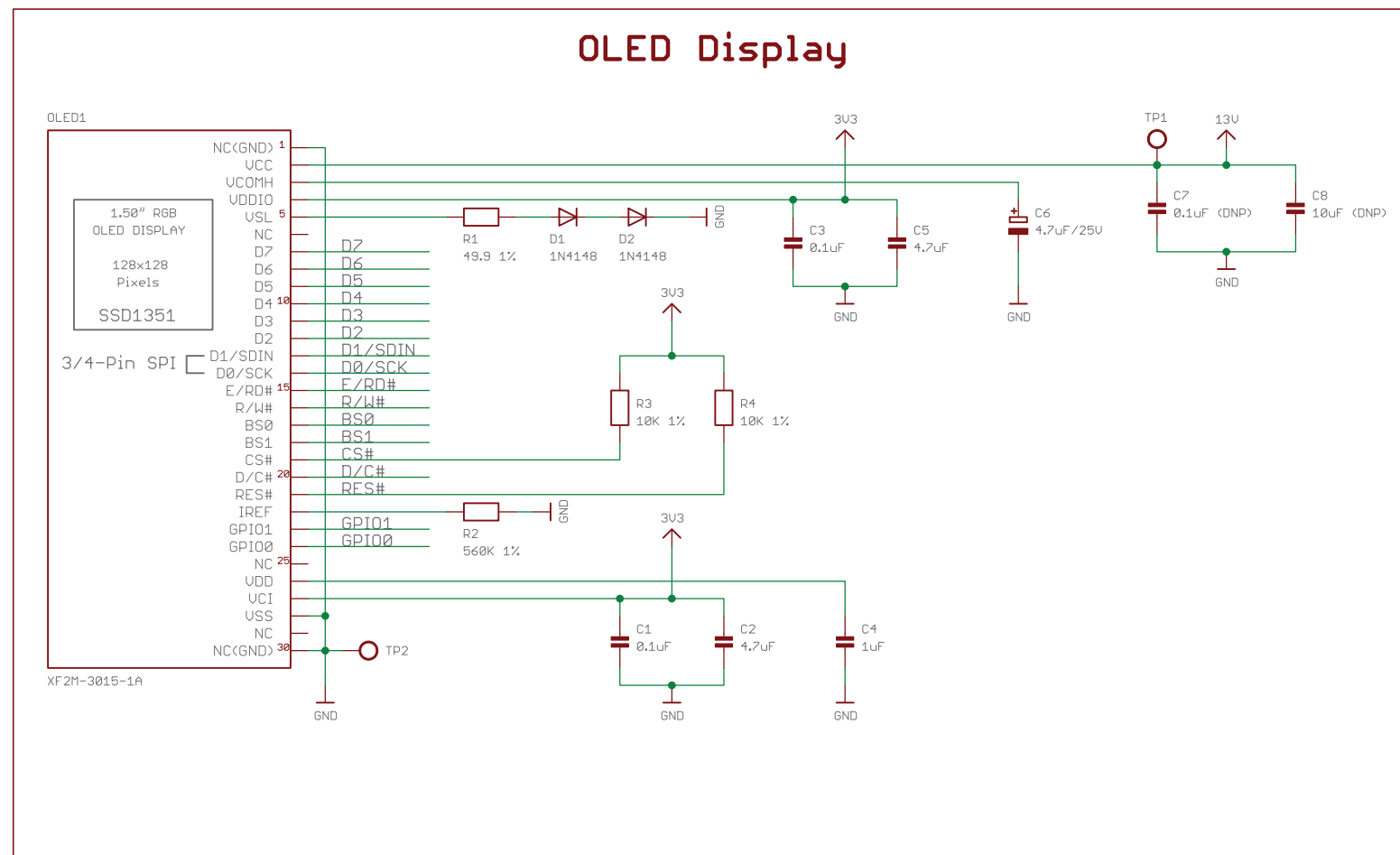
## Functions and Features

- Breakout board for 1.5” Color OLED Glass (NHD-1.5-128128G)
- On-board booster circuit (FAN5331SX)
- Jumper option to bypass booster circuit and provide  $V_{CC}$  directly
- Open source hardware



SYMBOL	REVISION	DATE

STANDARD TOLERANCE: (UNLESS OTHERWISE SPECIFIED)			
LINEAR: $\pm 0.3\text{mm}$		DRAWING/PART NUMBER: NHD-1.5-Breakout	REVISION: -
UNLESS OTHERWISE SPECIFIED: - DIMENSIONS ARE IN MILLIMETERS - THIRD ANGLE PROJECTION 		DRAWN BY: P. Bartek	APPROVED BY: P. Bartek
		DRAWN DATE: 09/17/19	APPROVED DATE: 09/17/19
		DO NOT SCALE DRAWING	SHEET 1 OF 1
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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	GPIO0	MPU	See command 0xB5 (can be treated as a no connect)
7	GPIO1	MPU	See command 0xB5 (can be treated as a no connect)
8	RES#	MPU	Active LOW Reset signal
9	D/C#	MPU	Register Select signal. LOW: Command. HIGH: Data
10	CS#	MPU	Active LOW Chip Select signal
11	BS1	MPU	MPU interface select signal
12	BS0	MPU	MPU interface select signal
13	R/W#	MPU	<b>6800 mode:</b> Read/Write signal. LOW: Write. HIGH: Read <b>8080 mode:</b> Active LOW Write signal
14	E/RD#	MPU	<b>6800 mode:</b> Enable signal. Falling edge triggered <b>8080 mode:</b> Active LOW Read signal
15	D0/SCK	MPU	<b>Parallel interface:</b> 8-bit bi-directional data bus  <b>Serial interface:</b> D0 = Serial Clock signal (SCK) D1 = Serial Data Input signal (SDIN)
16	D1/SDIN	MPU	
17	D2	MPU	
18	D3	MPU	
19	D4	MPU	
20	D5	MPU	
21	D6	MPU	
22	D7	MPU	
23-26	GND	Power Supply	Ground

## MPU Interface Pin Assignment Summary

Bus Interface	D7	D6	D5	D4	D3	D2	D1	D0	E	R/W	BS0	BS1	CS#	D/C#	RES#	GPIO1	GPIO0
8-bit 6800	D[7:0]								E	R/W	1	1	CS#	D/C#	RES#	NC	NC
8-bit 8080	D[7:0]								RD#	WR#	0	1	CS#	D/C#	RES#	NC	NC
4-wire SPI	0					NC	SDIN	SCK	0	0	0	0	CS#	D/C#	RES#	NC	NC
3-wire SPI	0					NC	SDIN	SCK	0	0	1	0	CS#	0	RES#	NC	NC

"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 <sub>OP</sub>	Absolute Max	-40	-	+70	°C
Storage Temperature Range	T <sub>ST</sub>	Absolute Max	-40	-	+85	°C
Supply Voltage for OLED Logic	3V3	-	2.8	3.0	3.5	V
Supply Voltage for Boost Circuit	DRV_VDD	-	-	5.0	5.5	V
Supply Voltage for OLED Panel	V <sub>CC</sub>	-	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-1.5-128128G.

Please download specification at <http://www.newhavendisplay.com/specs/NHD-1.5-128128G.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](http://www.newhavendisplay.com/specs/precautions.pdf)

## Warranty Information

See Terms & Conditions at [http://www.newhavendisplay.com/index.php?main\\_page=terms](http://www.newhavendisplay.com/index.php?main_page=terms)

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