

NHD-1.69-Breakout

Breakout Board for 1.69" Color OLED Glass

| | |
|-----------|---------------------|
| NHD- | Newhaven Display |
| 1.69- | 1.69" Diagonal Size |
| Breakout- | Breakout Board |

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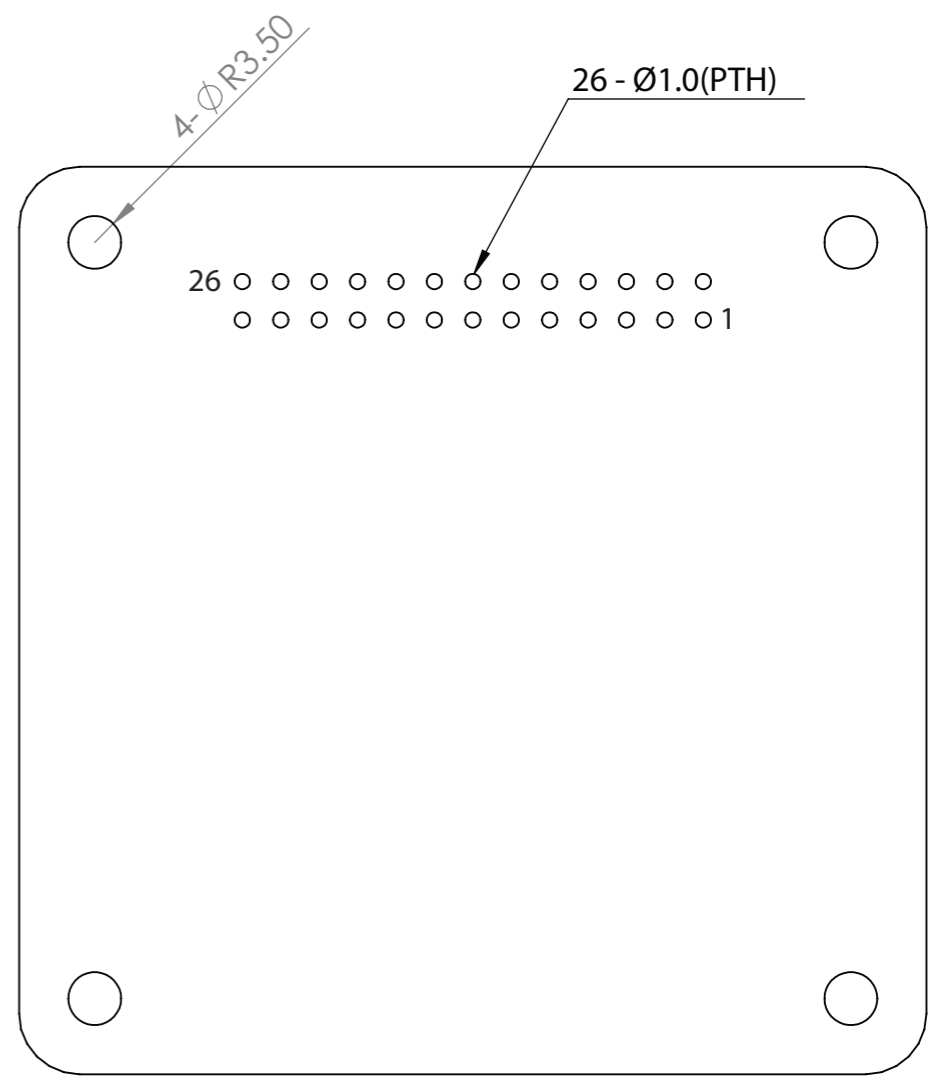
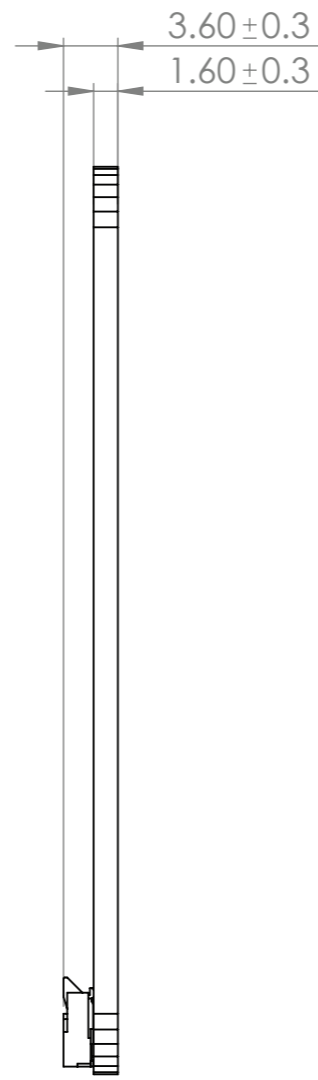
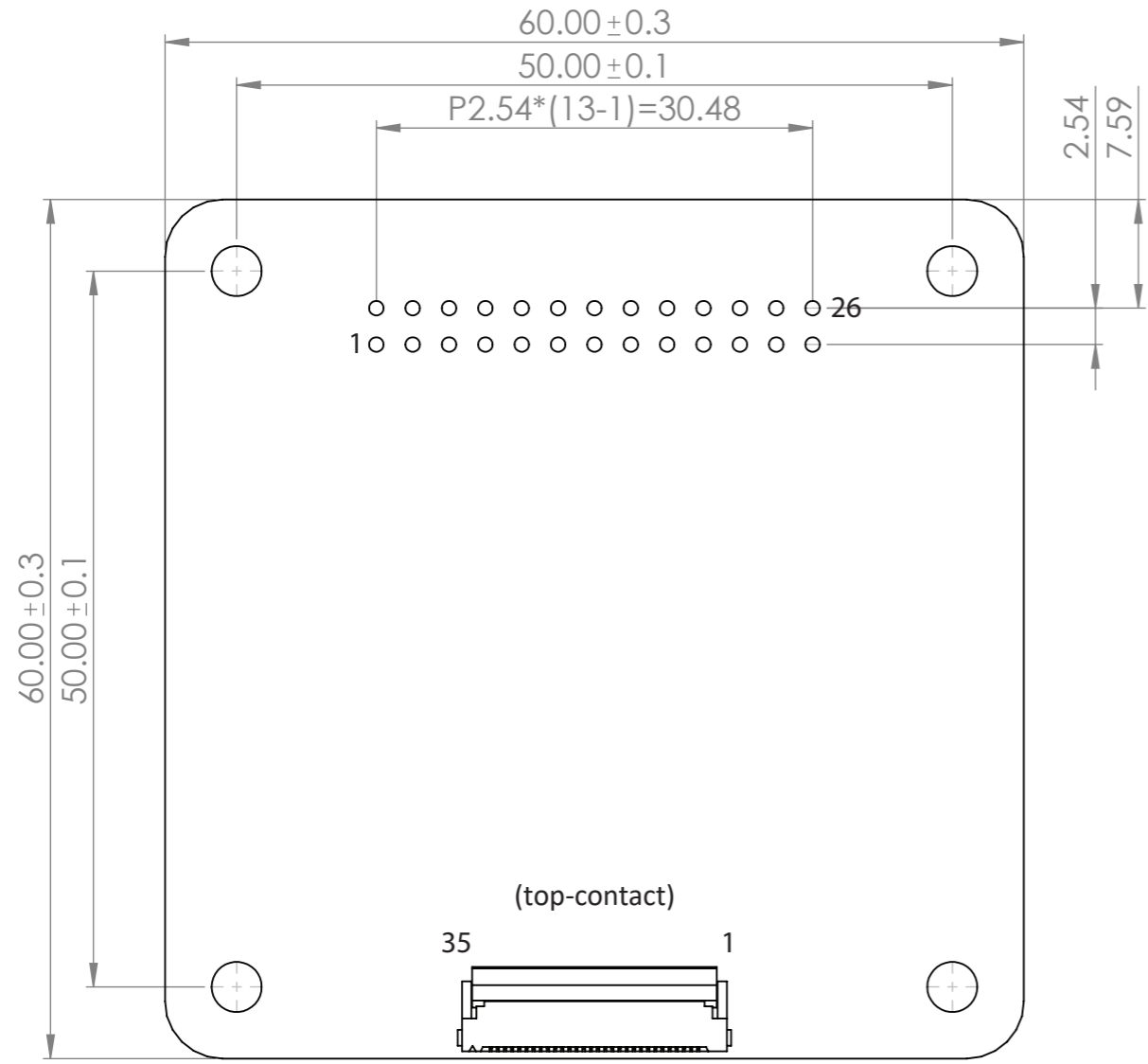
Document Revision History

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

Functions and Features



- Breakout board for 1.69" Color OLED Glass (NHD-1.69-160128G)
- On-board booster circuit (FAN5331SX)
- Jumper option to bypass booster circuit and provide V_{CC} directly
- Open source hardware

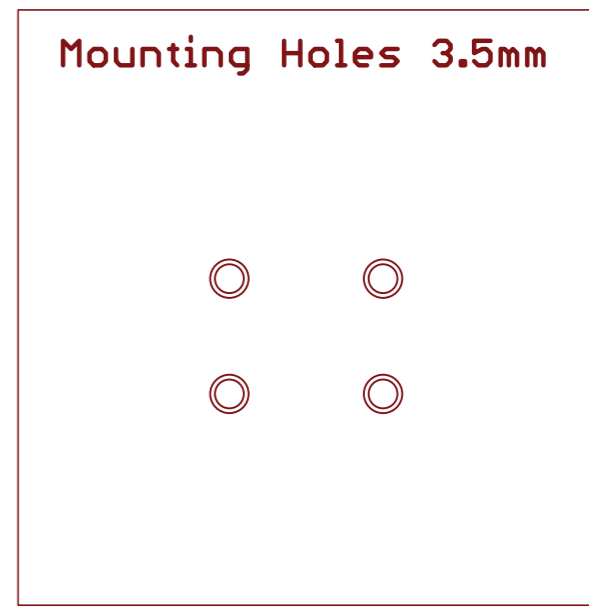
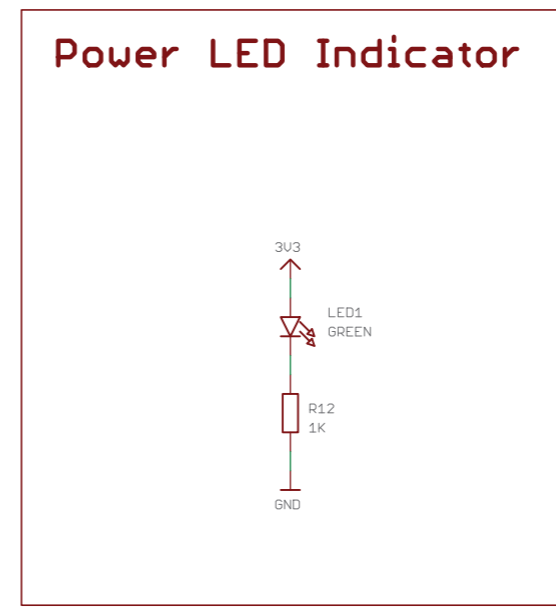
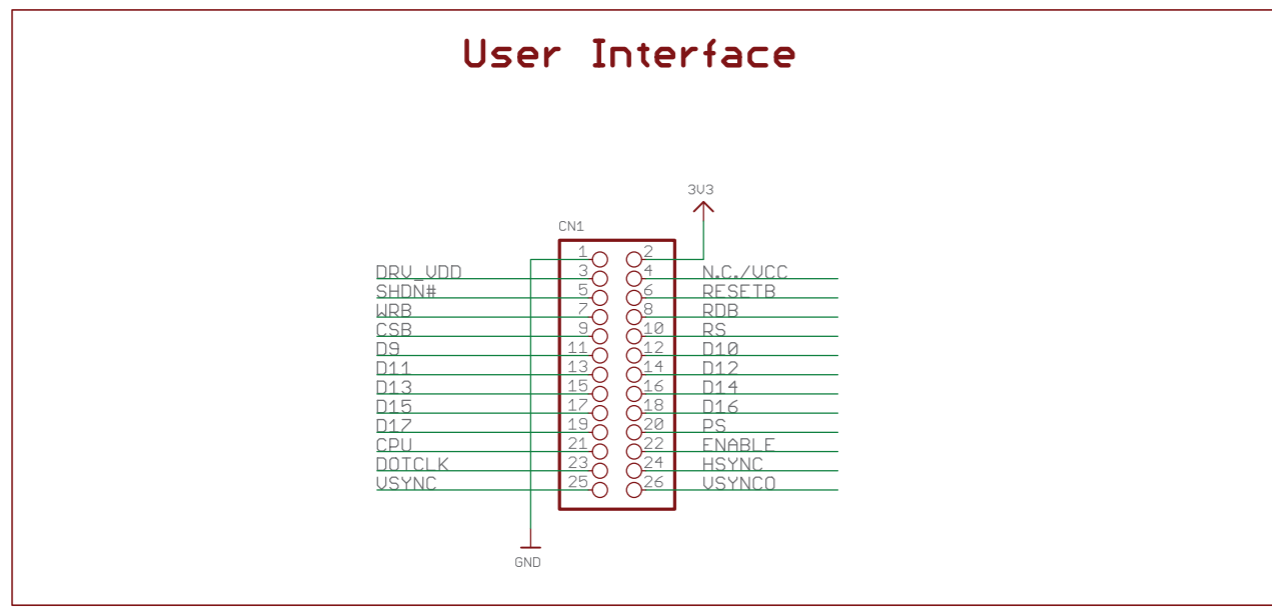
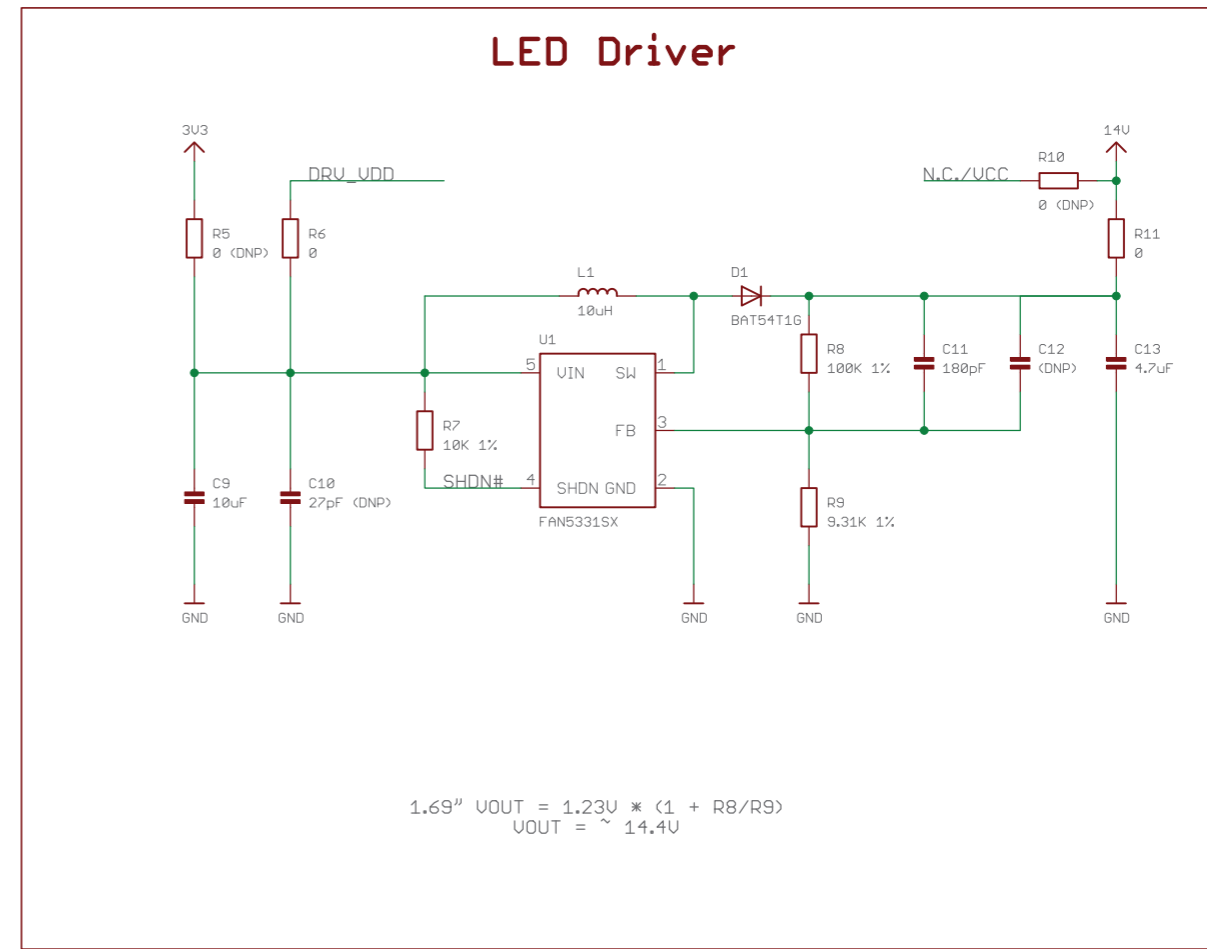
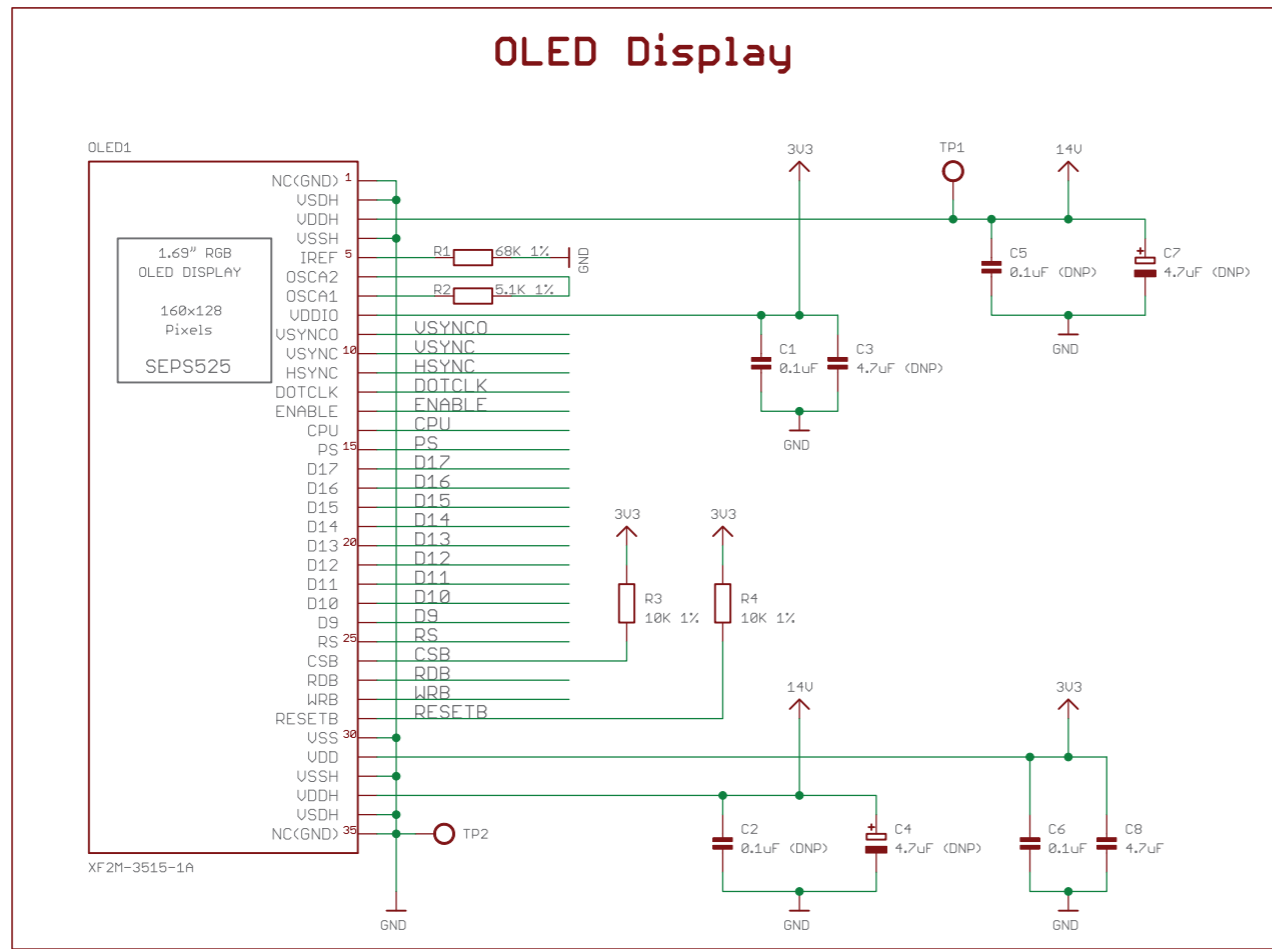
| | | | | | | | | |
|---|---|---|---|--------|----------|---|---|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| | | | | SYMBOL | REVISION | | | DATE |
| | | | | | | | | |
| | | | | | | | | |




[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 | |
| UNLESS OTHERWISE SPECIFIED: - DIMENSIONS ARE IN MILLIMETERS - THIRD ANGLE PROJECTION  | DRAWING/PART NUMBER: NHD-1.69-Breakout | |
| | REVISION: - | |
| DRAWN BY: P. Bartek | APPROVED BY: P. Bartek | SIZE: A3 |
| | DRAWN DATE: 09/17/19 | APPROVED DATE: 09/17/19 |
| DO NOT SCALE DRAWING | | SHEET 1 OF 1 |
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NEWHAVEN DISPLAY INTERNATIONAL

| | | |
|---|---------------|-----------------------------|
| SCHEMATIC / PART NUMBER: | | REVISION: |
| NHD-1.69-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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| | | <p>open source hardware</p> |

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 (+14V). (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 (+14V) 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} | - | 13.5 | 14.0 | 14.5 | 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-1.69-160128G.

Please download specification at <http://www.newhavendisplay.com/specs/NHD-1.69-160128G.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