

Product Specification

NHD-5.0-HDMI-N-RSXP-CTU

TFT Liquid Crystal Display

| | |
|--------------|------------------------|
| NHD- | Newhaven Display |
| 5.0- | 5" Diagonal |
| HDMI- | HDMI Interface |
| N- | 800x480 Resolution |
| RSXP- | IPS Display |
| CTU- | Capacitive Touch Panel |

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Additional Resources

- **Support Forum:** <https://support.newhavendisplay.com/hc/en-us/community/topics>
- **GitHub:** <https://github.com/newhavendisplay>
- **Example Code:** <https://support.newhavendisplay.com/hc/en-us/categories/4409527834135-Example-Code/>
- **Knowledge Center:** https://www.newhavendisplay.com/knowledge_center.html
- **Quality Center:** https://www.newhavendisplay.com/quality_center.html
- **Precautions for using LCDs/LCMs:** <https://www.newhavendisplay.com/specs/precautions.pdf>
- **Warranty / Terms & Conditions:** <https://www.newhavendisplay.com/terms.html>

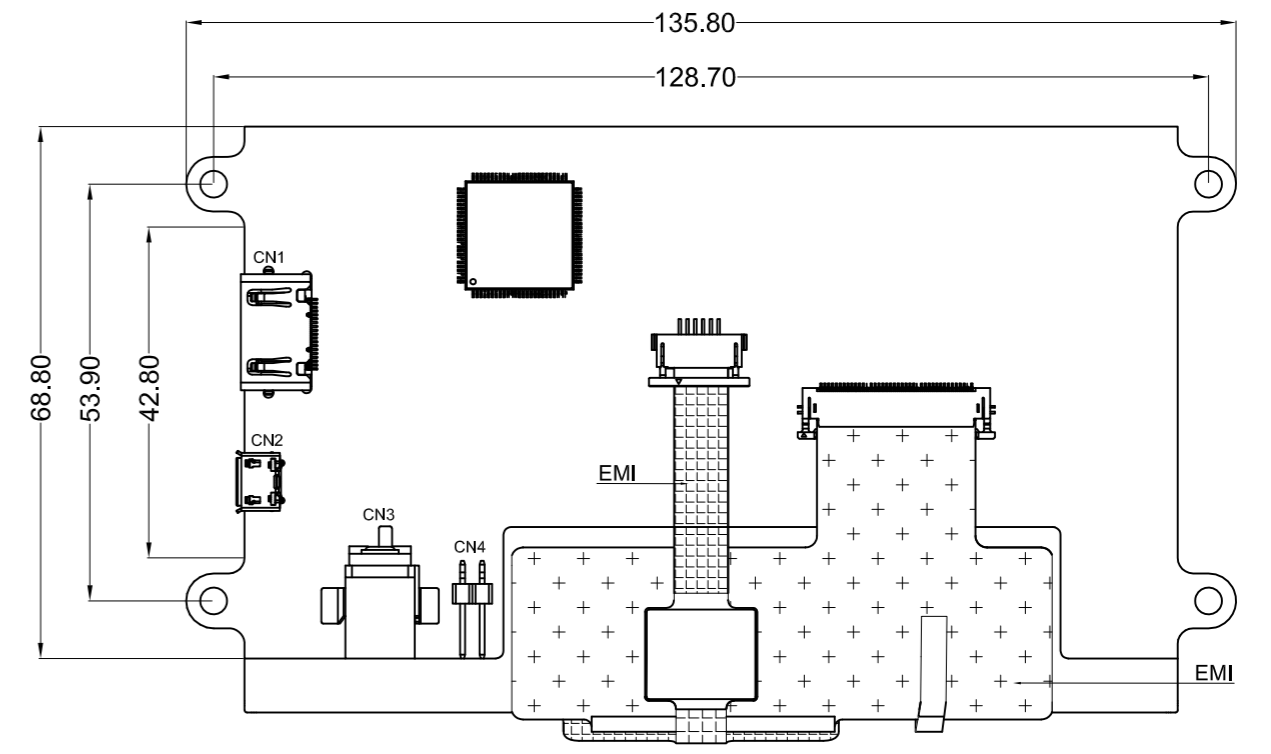
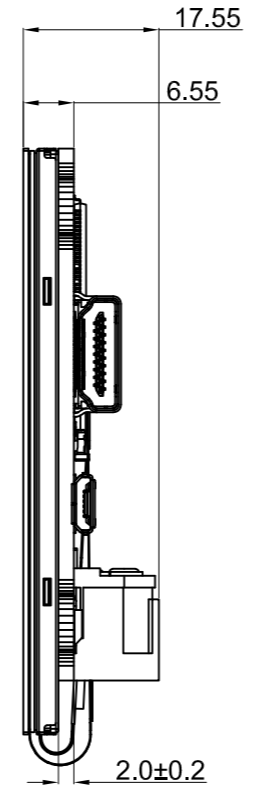
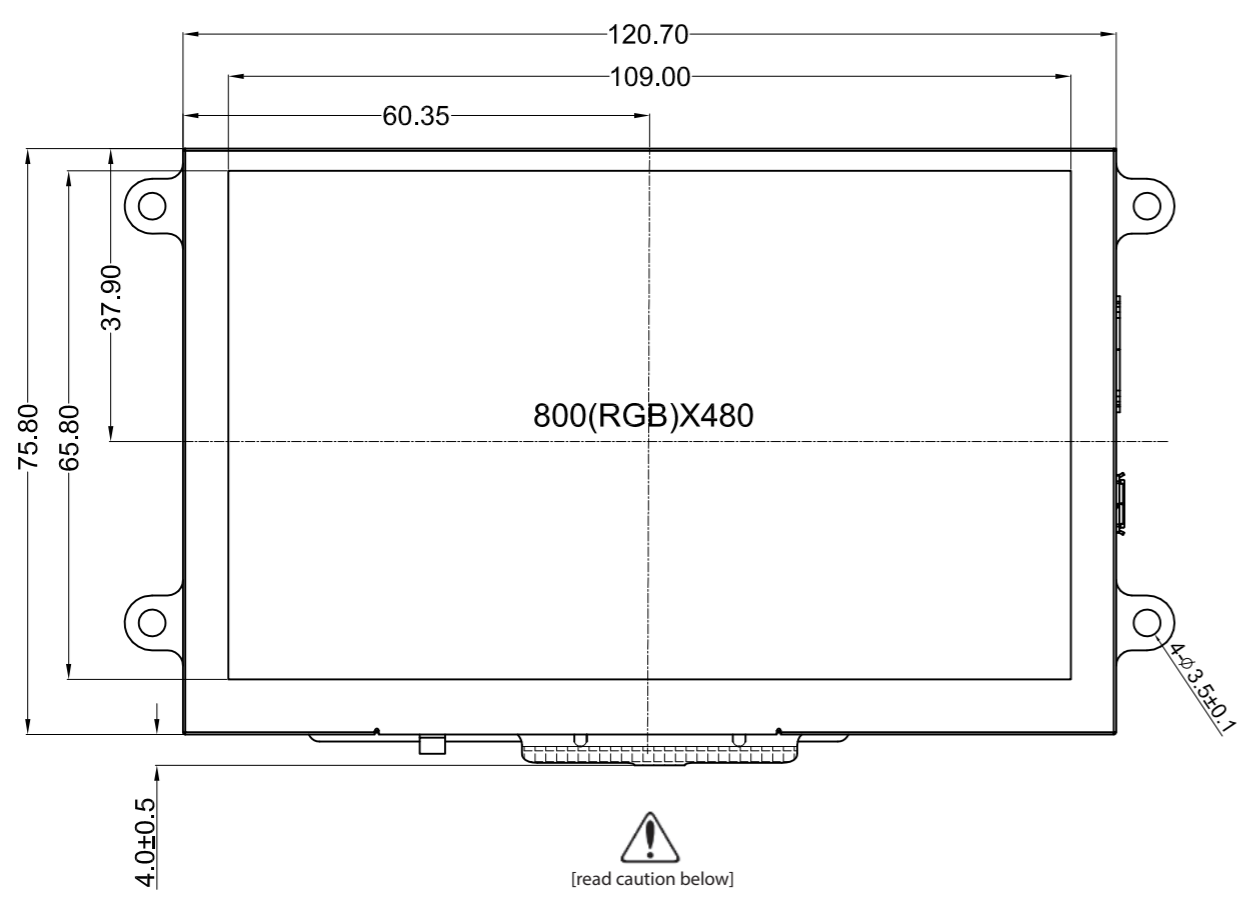


Document Revision History

| Revision | Date | Description | Changed By |
|----------|------------|------------------------------------------------------|------------|
| 0 | 06/15/2022 | Initial Release | CJ |
| 1 | 02/13/2023 | Supply Current Updated in Electrical Characteristics | KL |

Mechanical Drawing

Newhaven Display
 NHD-5.0-HDMI-N-RSXP-CTU
 Date Code
 Part Label (type/format may vary)



Product Description: 5.0" 800x480 IPS HDMI TFT w/ Capacitive Touch

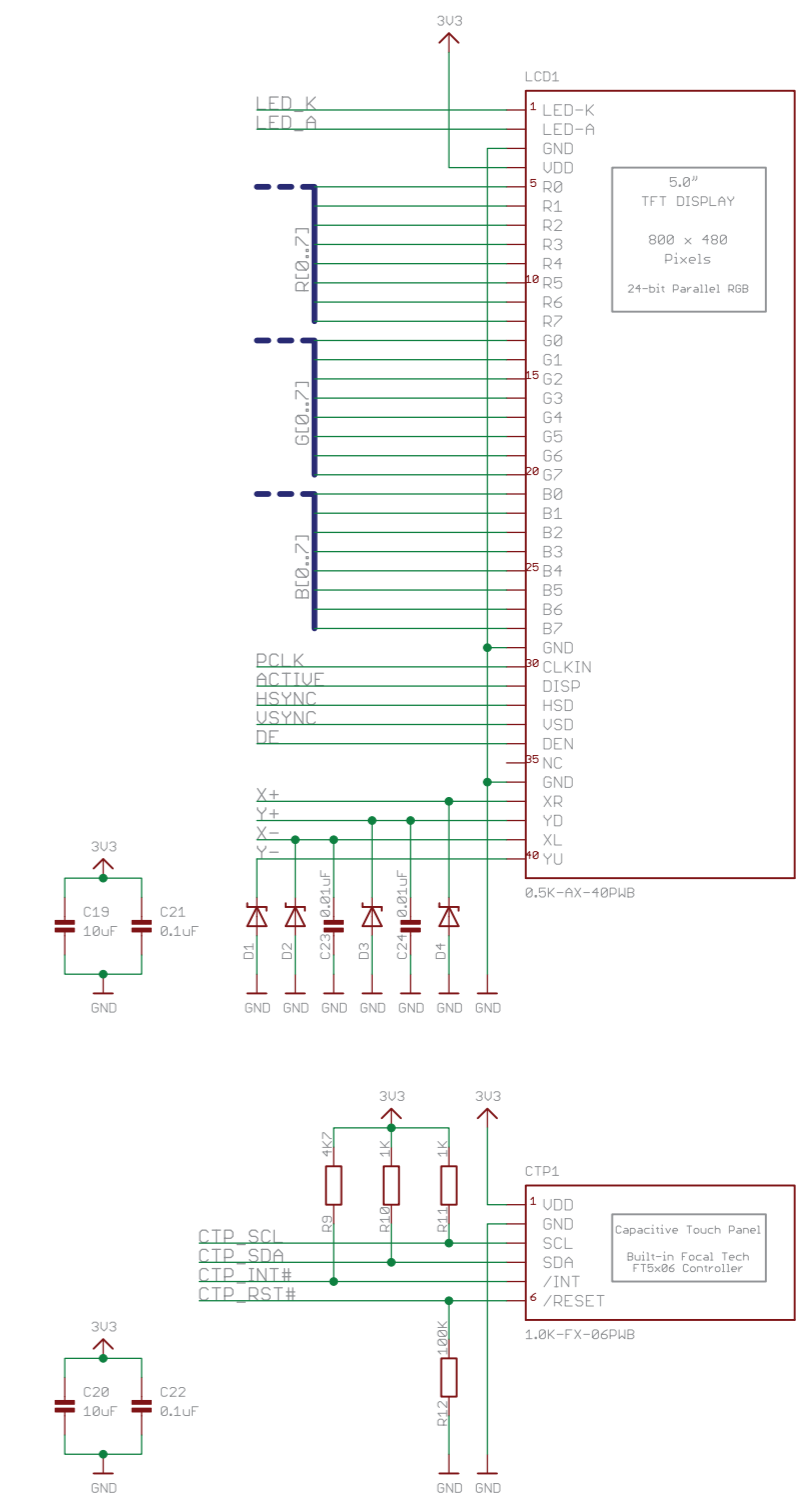
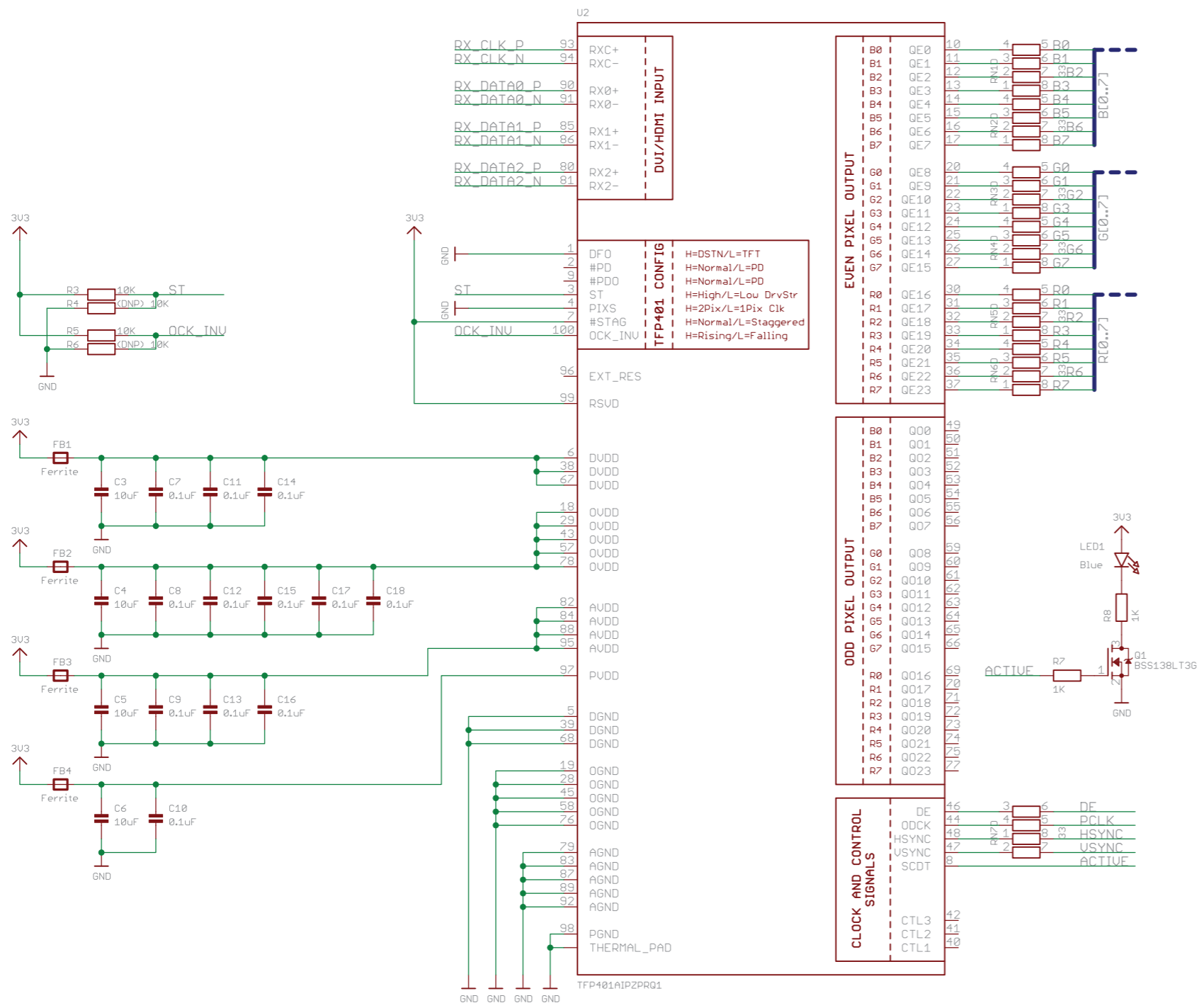
1. Driver IC: TFP401A
2. Interface: HDMI, USB
3. Power Requirement: 5.0V
4. Optical Features: Normally Black, Transmissive, 900cd/m²
5. EMI Shielded FPC

Improper handling of the FPC connections at the bottom edge of this module may cause damage resulting in display or touch failure. Take special care when handling this area of the display module to make sure these connections are never strained nor creased.

| | | |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Standard Tolerance: (Unless otherwise specified) Linear: ±0.3mm | | |
| | Drawing/Part Number: NHD-5.0-HDMI-N-RSXP-CTU | Revision: - |
| Unless otherwise specified: • Dimensions are in Millimeters • Third Angle Projection | Drawn By: K. Lewis Drawn Date: 02/13/2023 | Approved By: K. Lewis Approved Date: 02/13/2023 |
| | This drawing is solely the property of Newhaven Display International, Inc. The information it contains is not to be disclosed, reproduced or copied in whole or part without written approval from Newhaven Display. | |

TFP401 (DVI/HDMI Decoder)

LCD Interface

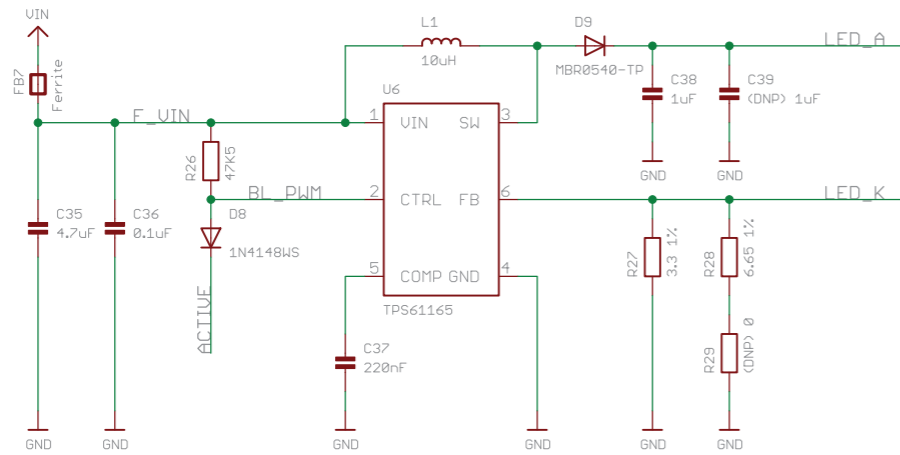


NEWHAVEN DISPLAY INTERNATIONAL

| | | |
|--------------------------|------------|--------------------------|
| Schematic / Part Number: | | Revision: |
| NHD-5.0-HDMI-N | | 1.1 |
| Drawn By: | K. Lewis | Checked By: K. Lewis |
| Drawn Date: | 12/01/2022 | Checked Date: 12/01/2022 |

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Backlight



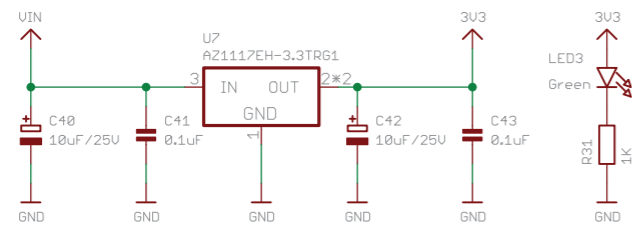
| Backlight Configuration | | |
|-------------------------|-------|--------------|
| Current | R29 | Display |
| ~60mA | Open | ATXL# |
| ~90mA | Close | ASXV#, ASXN# |

(Default)

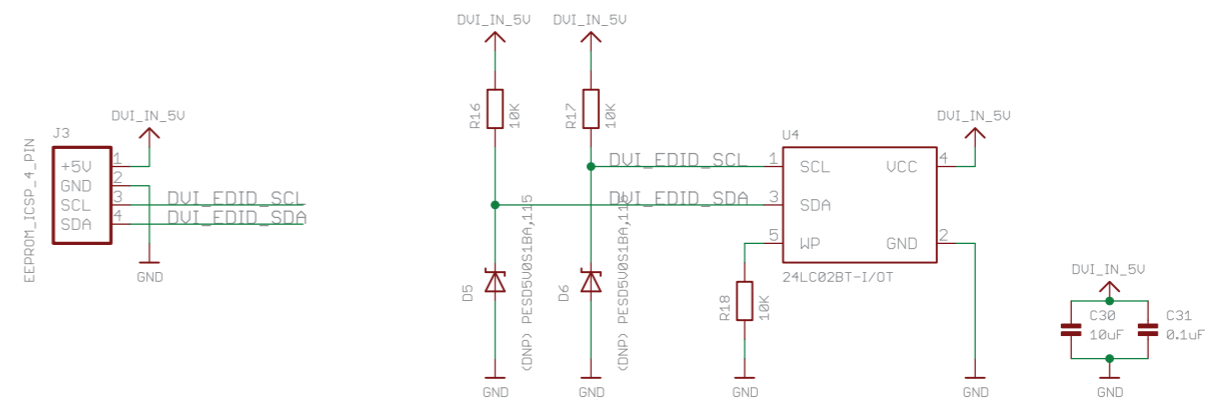
HDMI-A



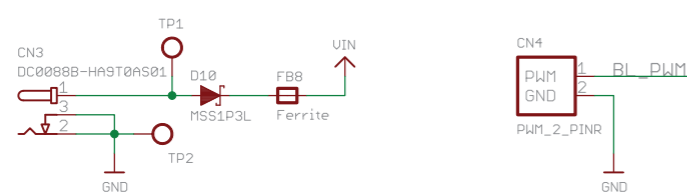
3.3V Regulator 800mA



EEPROM



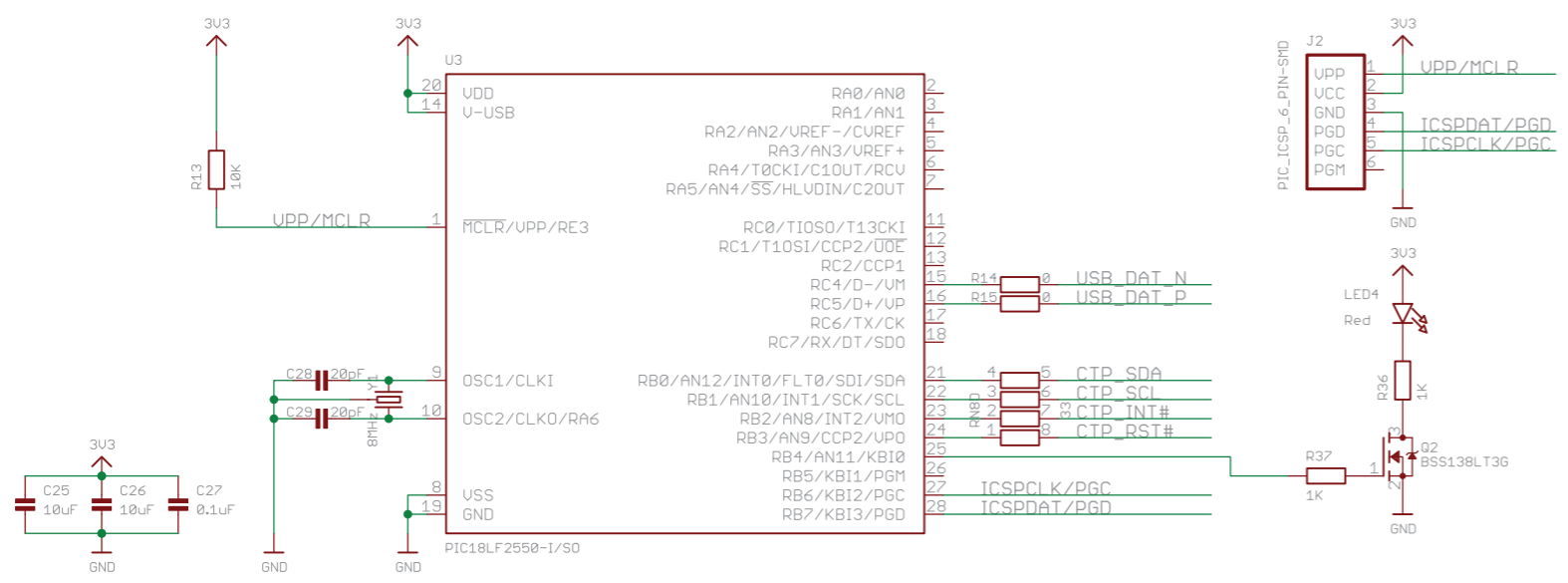
VIN / PWM



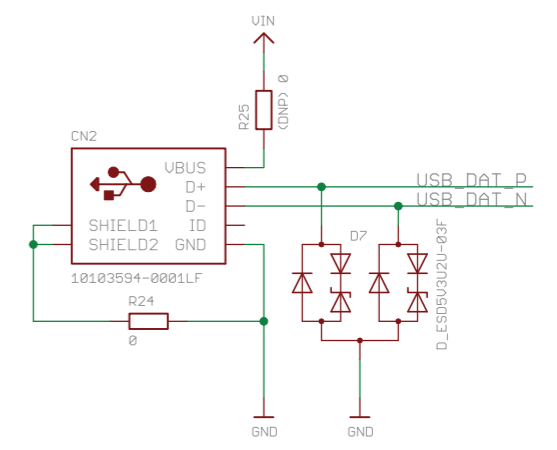
| | | |
|--------------------------|------------|--------------------------|
| Schematic / Part Number: | | Revision: |
| NHD-5.0-HDMI-N | | 1.1 |
| Drawn By: | K. Lewis | Checked By: K. Lewis |
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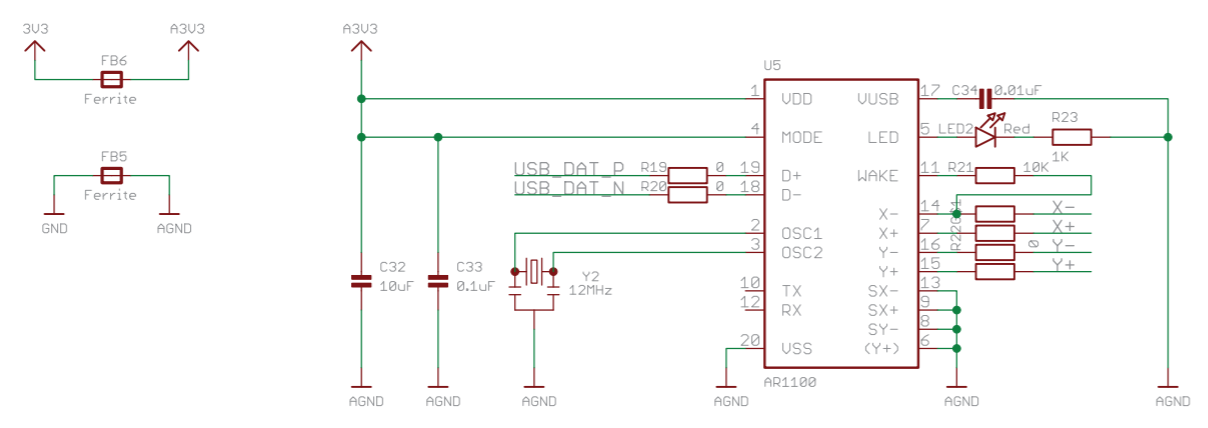
PIC18LF2550 / Capacitive Touch Screen Controller



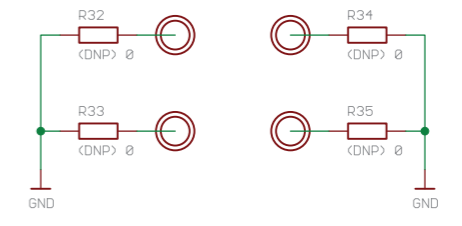
Micro-B USB



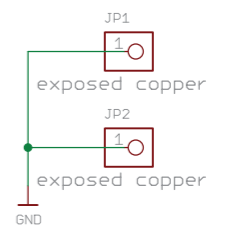
Resistive Touch Screen Controller



Mounting Holes 3.5mm Plated



Exposed Pads to Ground TFT Bezel



BOARD VERSIONS

RTU Version: (DNP) - C1, C20, C25, C26, C2, C22, C27, C28, C29, C39, CTP1, D1, D2, D3, D4, D5, D6, LED4, Q2, R4, R6, R13, R9, R10, R11, R36, R37, R12, R14, R15, R25, R29, R32, R33, R34, R35, RN8, U1, U3, Y1

CTU Version: (DNP) - C1, C32, C2, C33, C23, C24, C34, C39, D1, D2, D3, D4, D5, D6, FB5, FB6, LED2, R4, R6, R21, R19, R20, R25, R29, R22, R23, R32, R33, R34, R35, U1, U5, Y2

Non-Touch Version: (DNP) - C1, C20, C25, C26, C32, C2, C22, C27, C33, C23, C24, C34, C28, C29, C39, CN2, CTP1, D1, D2, D3, D4, D5, D6, D7, FB5, FB6, LED2, LED4, Q2, R4, R6, R13, R21, R9, R10, R11, R23, R36, R37, R12, R14, R15, R19, R20, R24, R25, R29, R22, R32, R33, R34, R35, RN8, U1, U3, U5, Y1, Y2



| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|
| Schematic / Part Number: | | Revision: |
| NHD-5.0-HDMI-N | | 1.1 |
| Drawn By: K. Lewis | Checked By: K. Lewis | |
| Drawn Date: 12/01/2022 | Checked Date: 12/01/2022 | |
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Electrical Characteristics

| Item | Symbol | Condition | Min. | Typical | Max. | Unit |
|-----------------------------|------------------|-------------------------|------|---------|------|------|
| Operating Temperature Range | T _{OP} | Absolute Max | -20 | - | +70 | °C |
| Storage Temperature Range | T _{ST} | Absolute Max | -30 | - | +80 | °C |
| Backlight PWM Voltage | V _{PWM} | - | 2.5 | 3.3 | 5.5 | V |
| Backlight PWM Frequency | f _{PWM} | V _{PWM} = 3.3V | 5 | - | 100 | kHz |
| Module Supply Voltage | V _{DD} | - | 5.0 | - | 7.0 | V |
| Module Supply Current | I _{DD} | V _{DD} = 5V | - | 560 | 590 | mA |
| | | V _{DD} = 7V | - | 420 | 450 | mA |

HDMI Receiver Information

On-board Texas Instruments TFP401A Receiver. To view the full TFP401A specification, please download it by accessing the link: <http://www.ti.com/lit/ds/slids190a/slids190a.pdf>

Technical Resource

| 3D Model | TFT Panel Used | Display Type | Luminance Rating | Optimal Viewing Angle | Touch Panel |
|-----------------------------------------|-------------------------------------------|--------------|-----------------------|-----------------------|----------------|
| NHD-5.0-HDMI-N-RSXP-CTU | NHD-5.0-800480TF-ASXP-CTP | IPS | 900 cd/m ² | 80° all angles | PCAP (USB-HID) |

EDID Array

```
const unsigned char NHD_HDMI5[] = {  
0x00, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0x00, 0x39, 0x04, 0x3B, 0x07, 0x00, 0x00, 0x00, 0x00,  
0x01, 0x11, 0x01, 0x03, 0x80, 0x0B, 0x07, 0x00, 0x0A, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,  
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x01, 0x01, 0x01, 0x01, 0x01, 0x01, 0x01, 0x01, 0x01,  
0x01, 0x01, 0x01, 0x01, 0x01, 0x01, 0x80, 0x0C, 0x20, 0x80, 0x30, 0xE0, 0x2D, 0x10, 0x28, 0x30,  
0xD3, 0x00, 0x6C, 0x41, 0x00, 0x00, 0x00, 0x18, 0x00, 0x00, 0x00, 0xFC, 0x00, 0x4E, 0x48, 0x44,  
0x2D, 0x35, 0x2E, 0x30, 0x20, 0x48, 0x44, 0x4D, 0x49, 0x0A, 0x00, 0x00, 0x00, 0x10, 0x00, 0x00,  
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x10,  
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0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,  
};
```

EDID Timing

| | | |
|-------------------|-------|----------------------|
| Pixel Clock: | 32.00 | MHz |
| H. Active Pixels: | 800 | V. Active Lines: 480 |
| H. Blank: | 128 | V. Blank: 45 |
| H. Front Porch: | 40 | V. Front Porch: 13 |
| H. Sync Width: | 48 | V. Sync Width: 3 |
| H. Clock: | 34.48 | kHz |
| V. Clock: | 65.68 | Hz |

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, 96 hrs. | 2 |
| Low Temperature storage | Endurance test applying the low storage temperature for a long time. | -30°C, 96 hrs. | 1,2 |
| High Temperature Operation | Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time. | +70°C, 96 hrs. | 2 |
| Low Temperature Operation | Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time. | -20°C, 96 hrs. | 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. | +60°C, 90% RH, 96 hrs. | 1,2 |
| Thermal Shock resistance | Endurance test applying the electric stress (voltage & current) during a cycle of low and high thermal stress. | -20°C, 30min->25°C, 5min -> 70°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. | Air: $V_s = \pm 8KV$, Contact: $V_s = \pm 4KV$ 10 Times | |

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.