

Product Specification

NHD-5.0-HDMI-N-RTXL-RTU

TFT Liquid Crystal Display

NHD-	Newhaven Display
5.0-	5" Diagonal
HDMI-	HDMI Interface
N-	800x480 Resolution
RTXL-	Premium (MVA) Display
RTU-	Resistive 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>

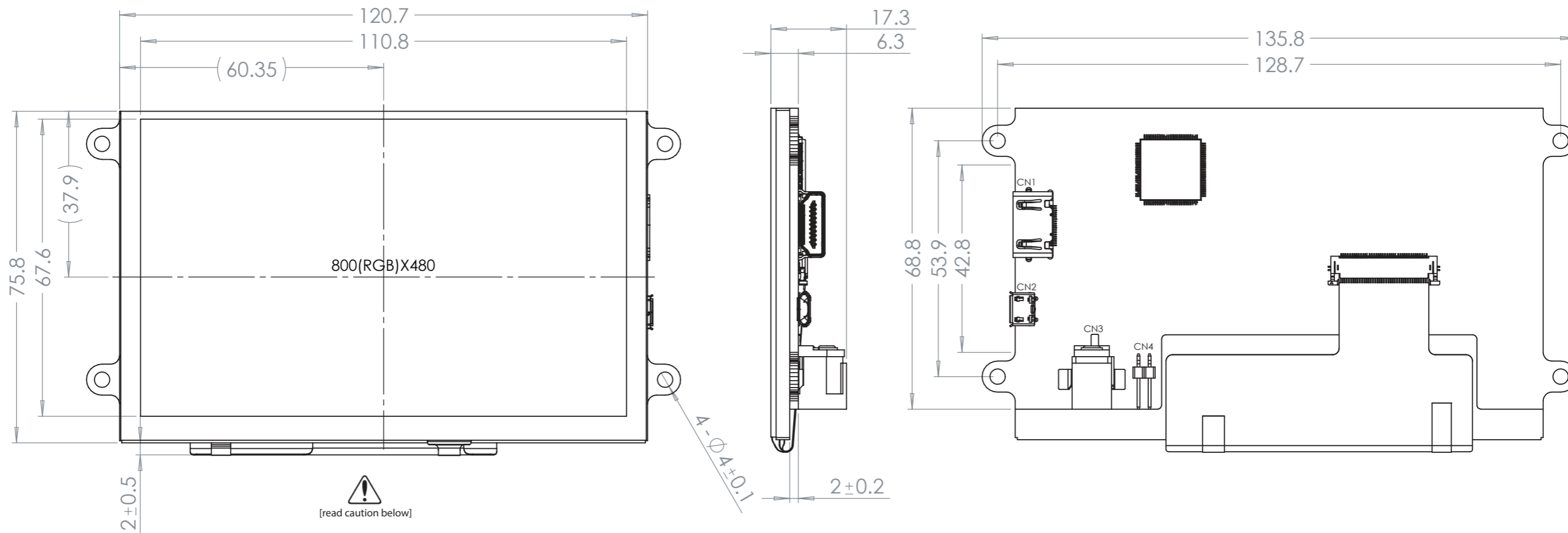


Document Revision History

Revision	Date	Description	Changed By
0	04/22/2021	Initial Release	ZP
1	01/25/2022	Updated Spec Format	ZP
2	02/14/2023	Supply Current Updated in Electrical Characteristics	KL

Mechanical Drawing

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



Product Description: 5.0" 800x480 Premium HDMI TFT w/ Resistive Touch

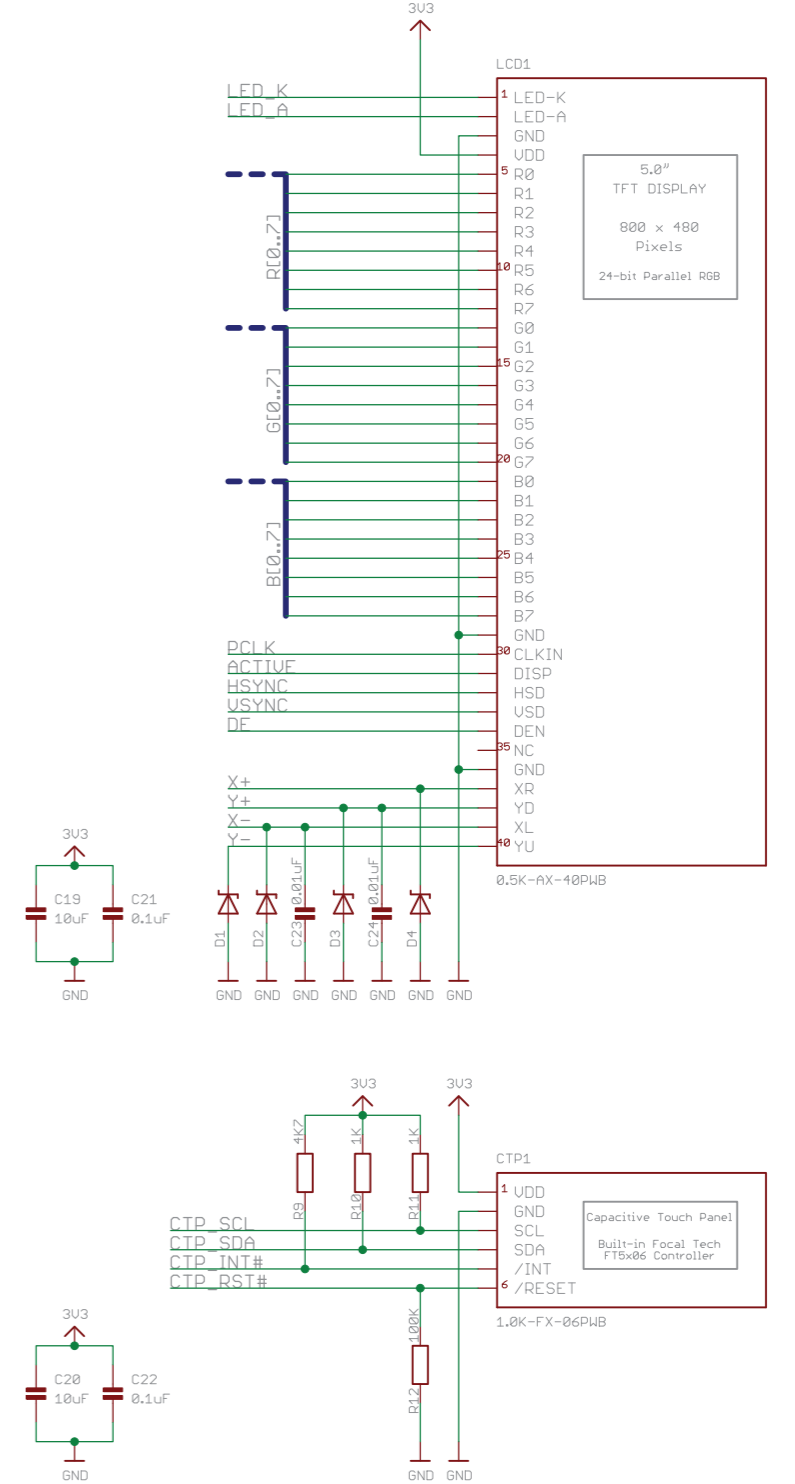
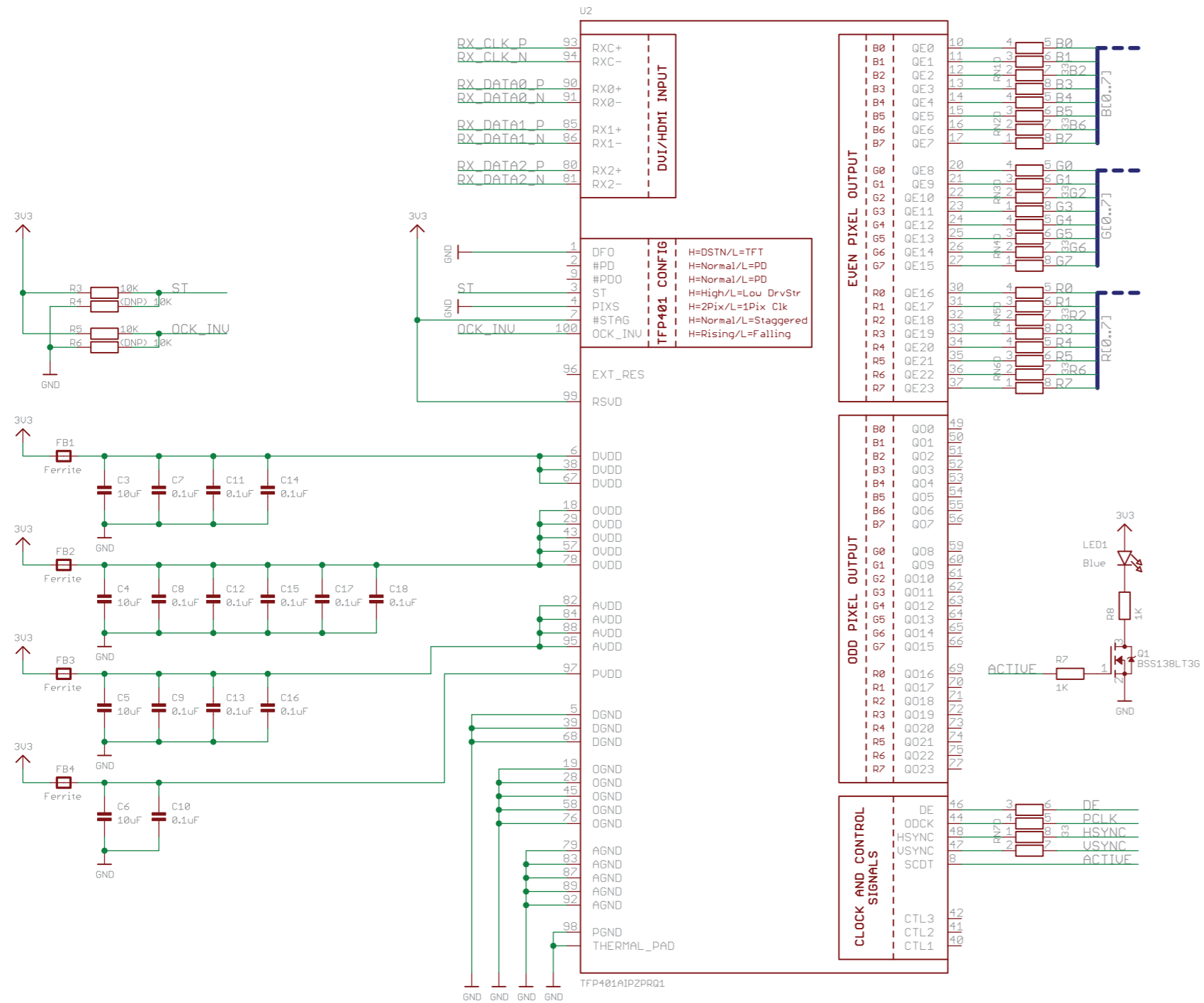
1. Driver IC: TFP401A
2. Interface: HDMI, USB
3. Power Requirement: 5.0V
4. Optical Features: Normally White, Transmissive, Anti-Glare, 480cd/m²

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 created.

Standard Tolerance: (Unless otherwise specified) Linear: ±0.3mm		
	Drawing/Part Number: NHD-5.0-HDMI-N-RTXL-RTU	Revision: -
Unless otherwise specified: • Dimensions are in Millimeters • Third Angle Projection	Drawn By: K. Lewis Drawn Date: 02/14/2023	Approved By: K. Lewis Approved Date: 02/14/2023
	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

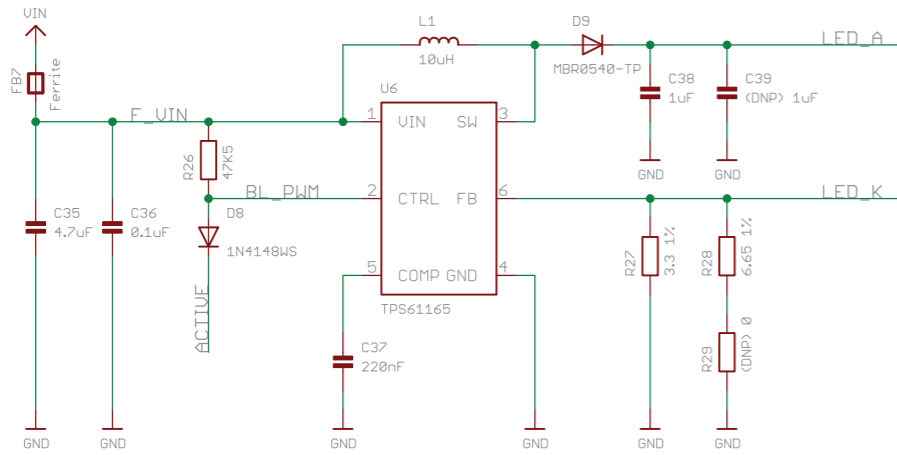


NEWHAVEN DISPLAY INTERNATIONAL

Schematic / Part Number:		Revision:
NHD-5.0-HDMI-N		1.1
Drawn By: K. Lewis	Checked By: K. Lewis	
Drawn Date: 02/03/2023	Checked Date: 02/03/2023	

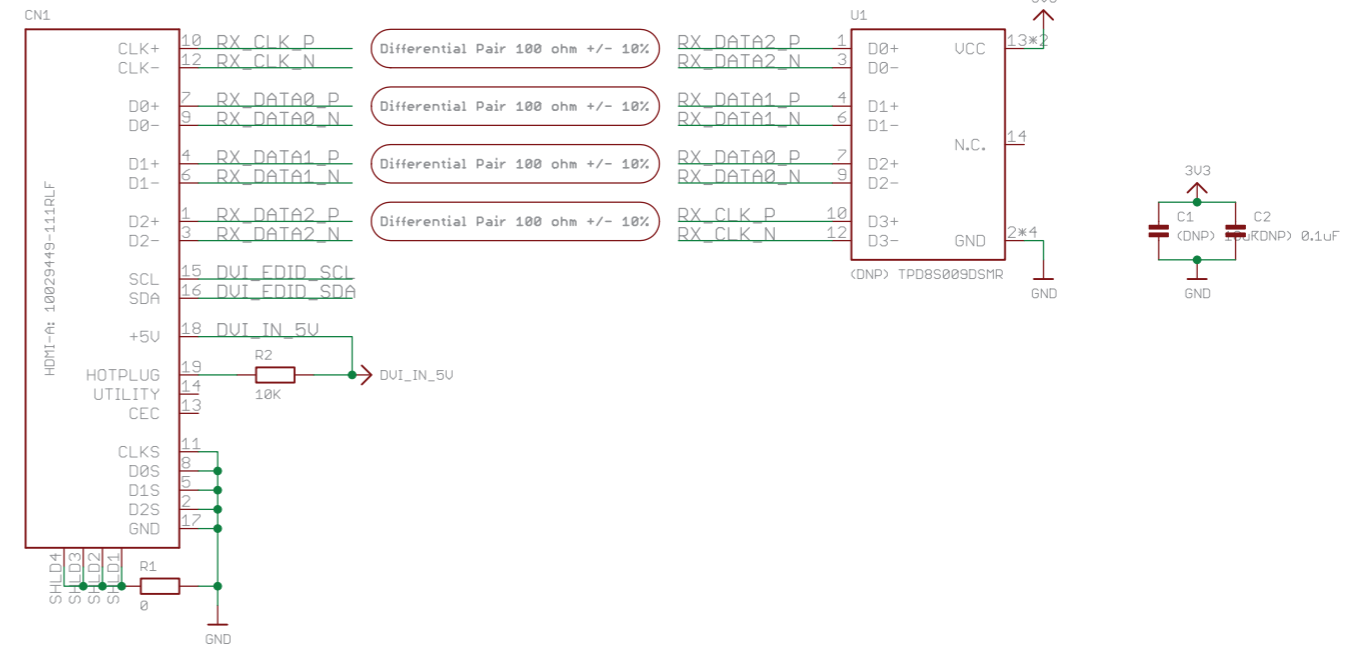
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Backlight

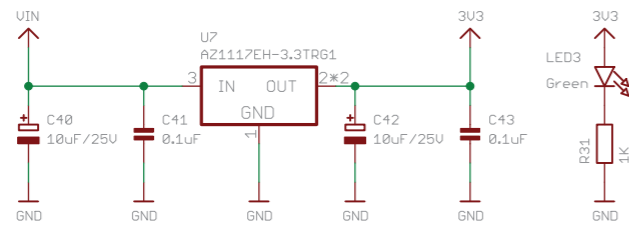


Backlight Configuration		
Current	R29	Display
(Default) ~60mA	Open	ATXL#
~90mA	Close	ASXV#, ASXN#

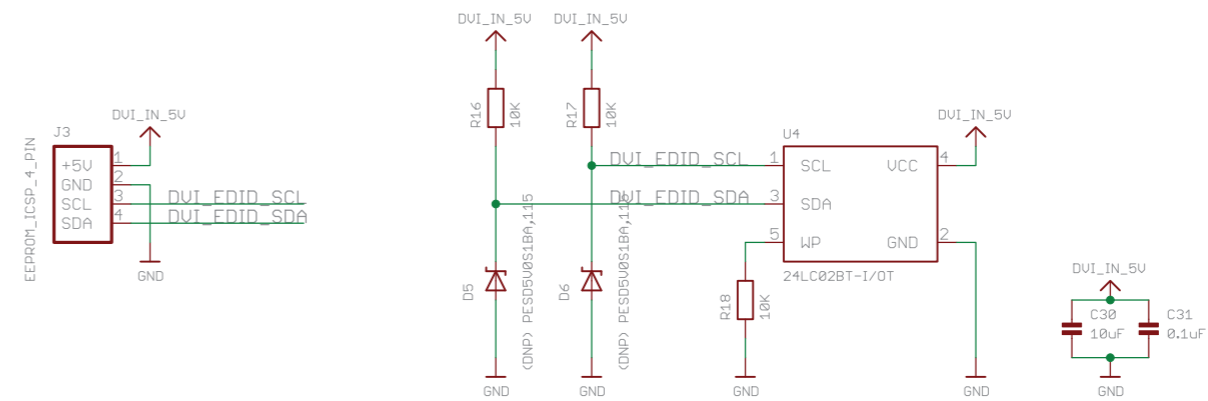
HDMI-A



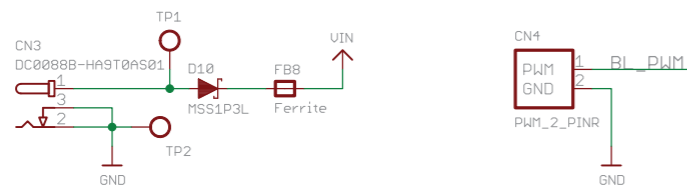
3.3V Regulator 800mA



EEPROM



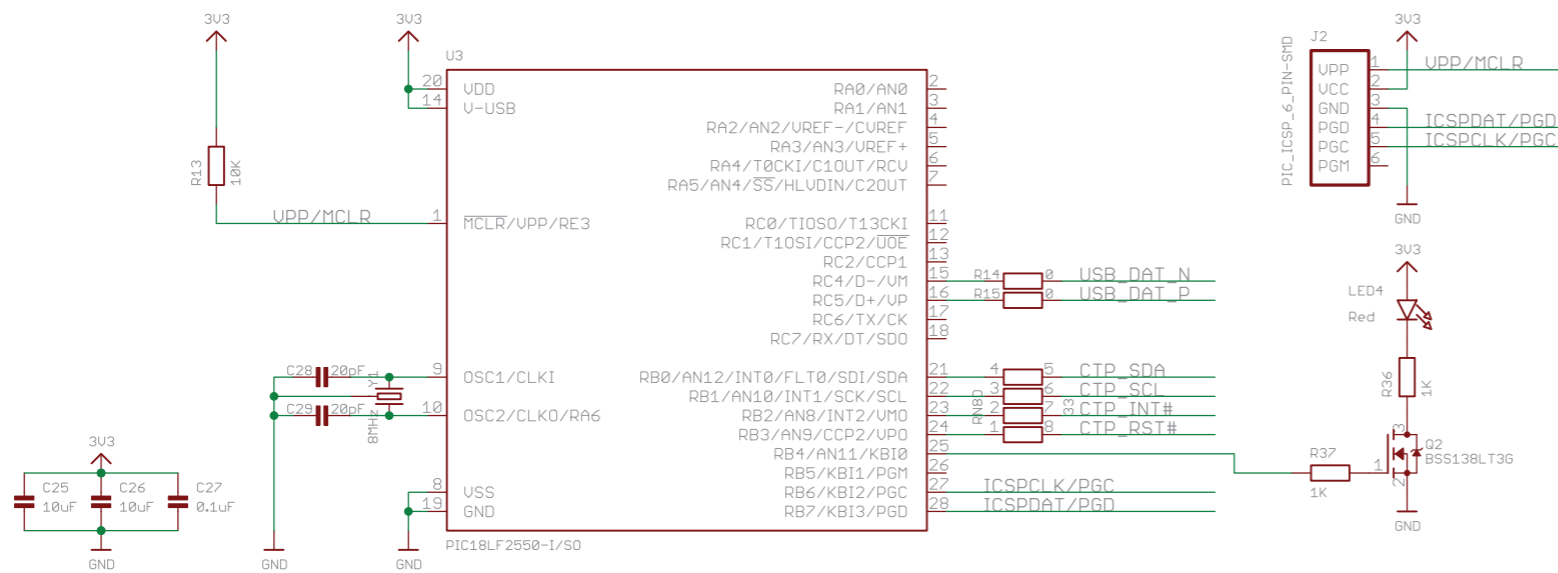
VIN / PWM



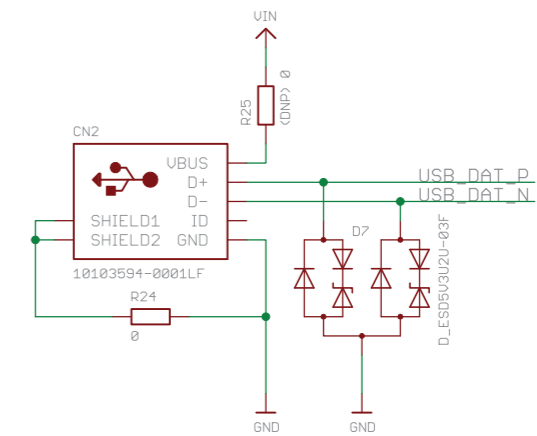
Schematic / Part Number: NHD-5.0-HDMI-N		Revision: 1.1
Drawn By: K. Lewis	Checked By: K. Lewis	
Drawn Date: 02/03/2023	Checked Date: 02/03/2023	

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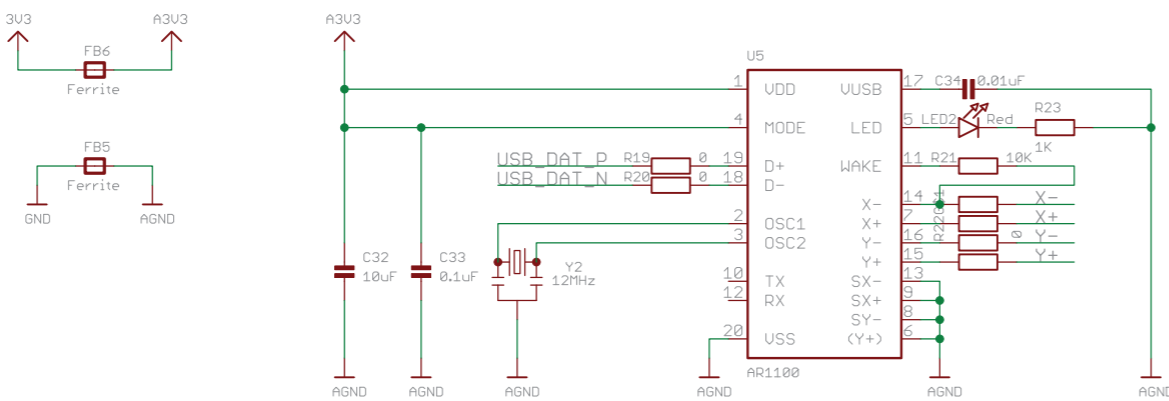
PIC18LF2550 / Capacitive Touch Screen Controller



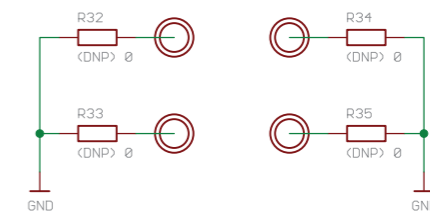
Micro-B USB



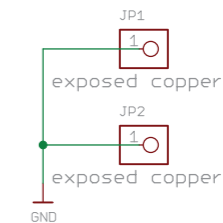
Resistive Touch Screen Controller



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:	02/03/2023	Checked Date: 02/03/2023

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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-RTXL-RTU	NHD-5.0-800480TF-ATXL#-T	Premium MVA	480 cd/m ²	70° all angles	4-Wire Resistive (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,  
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0x00, 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.