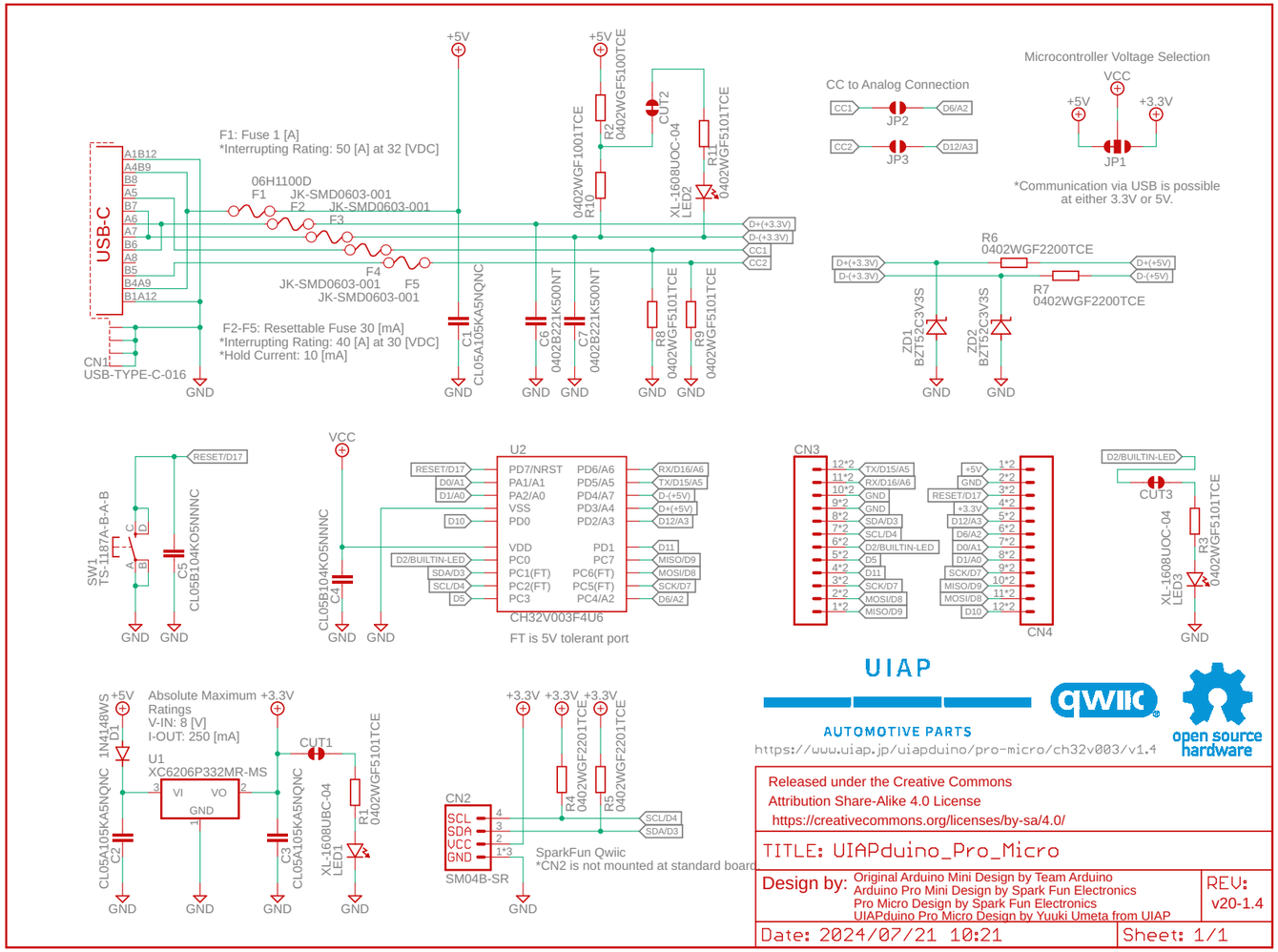

USB 2.0 Specification
https://www.usb.org/document-library/usb-20-specification

7.1.5.1 Low-/Full-speed Device Speed Identification
Low-speed devices are terminated as shown in Figure 7-21 with the pull-up resistor on the D- line.
A device that has a detachable cable must use a 1.5 kΩ ±5% resistor tied to a voltage source between 3.0 V and 3.6 V (VTERM) to satisfy these requirements.
Devices with captive cables may use alternative termination means. However, the Thevenin resistance of any termination must be no less than 900 Ω.

7.1.6.1 Low-speed and Full-speed Input Characteristics
The termination must be able to charge the D+ or D- line from 0 V to VIH (min) within 2.5 µs.

Table 7-7. DC Electrical Characteristics
Input Levels for Low-/full-speed
High (Driven): Min 2.0 V
High (floating): 2.7 - 3.6 V
Low: Max 0.8 V
Output Levels for Low-/full-speed
Low: 0.0 - 0.3 V
High (Driven): 2.8 - 3.6 V
Decoupling Capacitance
Upstream Facing Port Bypass Capacitance (VBUS to GND): 1.0 - 10.0 µF
Input Capacitance for Low-/full-speed
Transceiver edge rate control capacitance: Max 75 pF
Terminations
Bus Pull-up Resistor on Upstream Facing Port: 1.5 kOhm ±5%
Bus Pull-down Resistor on Downstream Facing Port: 15 kOhm ±5%

Table 7-10. Low-speed Source Electrical Characteristics
Driver Characteristics
Upstream Facing Port (w/cable, low-speed only): 200 - 450 pF

USB Type-C® Cable and Connector Specification Release 2.3
https://www.usb.org/document-library/usb-type-cr-cable-and-connector-specification-release-23

Table 3-10 USB Full-Featured Type-C Standard Cable Assembly Wiring
Notes:
3. Contacts B6 and B7 should not be present in the USB Type-C plug.

4.3 Sideband Use (SBU)
The SBU pins on a port shall either be open circuit or have a weak pull-down to ground no stronger than zSBUTermination (≥ 950 kΩ) when in USB 3.2 or USB 2.0.

Table 4-27 Source CC Termination (Rp) Requirements
Resistor pull-up to 4.75 – 5.5 V
Default USB Power: 56 kΩ ± 20%
1.5 A @ 5 V: 22 kΩ ± 5%
3.0 A @ 5 V: 10 kΩ ± 5%

Table 4-28 Sink CC Termination (Rd) Requirements
± 10% resistor to GND5.1 kΩ

Table 4-39 Voltages on Sink CC Pins – Multiple Source Current Advertisements
Detection
vRa: −0.25 V to 0.15 V (Threshold 0.2 V)
vRd-Connect: 0.25 V to 2.04 V
vRd-USB: 0.25 V to 0.61 V (Threshold 0.66 V)
vRd-1.5: 0.70 V to 1.16 V (Threshold 1.23 V)
vRd-3.0: 1.31 V to 2.04 V

CH32V003 Datasheet
https://www.wch-ic.com/downloads/CH32V003DS0_PDF.html

Table 3-16 General-purpose I/O static characteristics
VIH: 0.22 x (VDD - 2.7) + 1.55 to VDD + 0.3
1.682V to 3.6V @VDD = 3.3V
2.056V to 5.3V @VDD = 5V
*FT I/O pin: Max 5.5 V
VIL: -0.3 to 0.19 x (VDD - 2.7) + 0.65
-0.3V to 0.764V @VDD = 3.3V
-0.3V to 1.087V @VDD = 5V

3.3.9 I/O port characteristics
Output drive current characteristics
GPIO (General-Purpose Input/Output Port) can sink or output up to ±8mA current, and sink or output ±20mA current (not strictly to VOL/VOH).