

USB-A PullDown network

The diagram illustrates a USB-A PullDown network. It features three main signal lines: USB_A_PUPD, USB_DP, and USB_DM. The USB_A_PUPD line is connected to a 15kΩ equivalent capacitance. The USB_DP line is connected to a 1.1kΩ resistor (R1) and a 1.1kΩ pullup resistor (R2). The USB_DM line is connected to a 12kΩ resistor (R3) and a 12kΩ pullup resistor (R4). The circuit also includes two diodes, D1 and D2, each with a ~800mVf characteristic. The USB_DP line is labeled with a 1.1kΩ pullup for full speed device mode USB1.1. The USB_DM line is labeled with a 12kΩ pullup for host mode.

1.5k Equivalent

D1
~800mVf

D2
~800mVf

1.1K
R1

1.1K
R2

12K
R3

12K
R4

USB_A_PUPD

USB_DP

USB_DM

D+, D- 1.1k pullup for full speed device mode USB1.1

D+, D- 12k pullup for host mode

15k Equivalent

USB-C Pullup PullDown network

USB_DP_PUPD

USB_DM_PUPD

USB_DP

USB_DM

D4 ~800mVf

D6 ~800mVf

R4 1.1K

R9 12K

R10 1.1K

R11 12K

D+ 1.1k pullup for full speed device mode USB1.1

D- 1.1k pullup for low speed device mode USB1.0

D+,D- 12k pulldown for host mode

USB_CC

USB_DM

D8 ~800mVf

D10 ~800mVf

R5 36K

R6 5.1K

R7 36K

R8 5.1K

CC1

CC2

When in SOURCE mode, pull up: 4.11.1 Termination Parameters Resistor pull-up to 3.3 V \pm 5% Default USB power: 36K \pm 20%

When in SINK mode, pull down both CC pins through separate 5.1K resistors.

These CC resistors will probably work as is we still might need to recalculate.

USB-A Connector

USB2.0

VBUS

D+

D-

GND

1

2

3

4

J4 JVBUSA

+5V

USBA_VBUS

xUSB_A_DP

xUSB_A_DM

Pmod Connector

The diagram illustrates the Pmod Connector circuit. It features four main components: J5 JDP, J6 JDM, J1 PMOD, and J7 AUX5V.

- J5 JDP:** A connector with two pins. Pin 1 is connected to USB_A_DP and Pin 2 is connected to USB_C_DP.
- J6 JDM:** A connector with two pins. Pin 1 is connected to USB_A_DM and Pin 2 is connected to USB_C_DM.
- J1 PMOD:** A 12-pin connector. Pins 7, 8, 9, and 10 are connected to SBC_CC, A_PUPD, SBA_DP, and SBA_DM respectively. Pins 1, 2, 3, and 4 are connected to USB_C_+, USB_C_-, USB_C_+, and USB_C_-. Pins 11 and 12 are connected to GND. Pins 5 and 6 are marked with an 'X' and are not connected.
- J7 AUX5V:** A connector with two pins. Pin 1 is connected to GND and Pin 2 is connected to +5V.

A +5V supply is connected to the J7 AUX5V connector. A capacitor C1 (150uF) is connected between the +5V supply and GND.

USB-C Connector

The diagram illustrates the USB-C connector circuit. The connector (J2A) is connected to a +5V supply via a 2-ohm resistor (J8 JVBUSC) to the VBUS pin (A4). The VBUS pin is also connected to the USB_VBUS signal. The CC1 pin (A5) is connected to the CC1 signal, and the CC2 pin (B5) is connected to the CC2 signal. The D- pin (A7) is connected to the xUSB_DP signal, and the D+ pin (B6) is connected to the xUSB_DM signal. The SBU1 pin (A8) and SBU2 pin (B8) are connected to the USB_CC signal. The connector also has a GND pin (A1) and a SHIELD pin (S1).

Sheet: /		
File: usb.sch		
Title: iCEBreaker PMOD – USB		
Size: A4	Date:	Rev: V0.1a
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