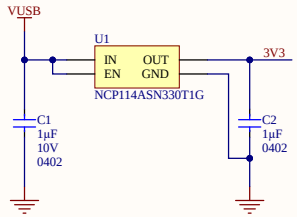
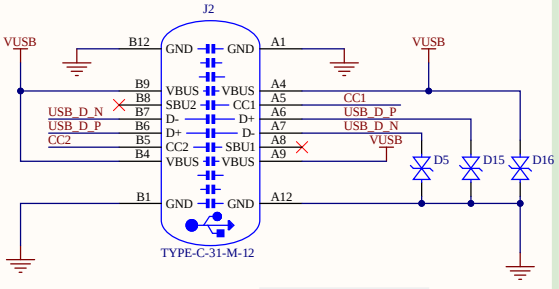
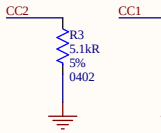
3V3 Regulator



Power supply





DFP pull up resistors and current:

56k -- up to 500 mA
56k -- up to 900 mA

22k --up to 1500 mA

10k -- up to 3000 mA

Either CC1 or CC2 will be connected to the DFP (host) via cable. Pull down resistors R3/R4 will form a potential divider with the pull up resistors on the DFP.

Via ADC, the MCU can sense the power delivery capabilities of the DFP without any negotiation.

Approximate ADC values at 5.0V:

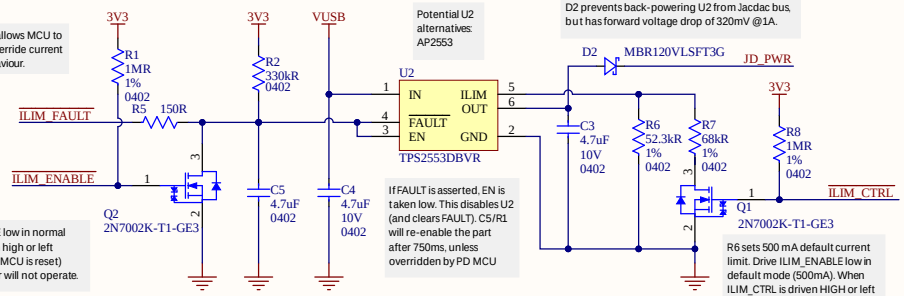
(((5.1/56+5.1) * 5V) / 3.3V) * 1023 = 129

(((5.1/22+5.1) * 5V) / 3.3V) * 1023 = 291

(((5.1/10+5.1) * 5V) / 3.3V) * 1023 = 525

Current limiters

ILIM_FAULT allows MCU to sense and override current limiting behaviour.



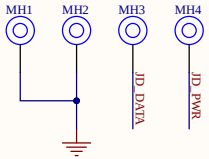
D2 prevents back-powering U2 from Jacdac bus, but has forward voltage drop of 320mV @1A.

Drive ILIM_ENABLE low in normal operation. If driven high or left floating (e.g. when MCU is reset) then current limiter will not operate.

If FAULT is asserted, EN is taken low. This disables U2 (and clears FAULT). C5/R1 will re-enable the part after 750ms, unless overridden by PD MCU

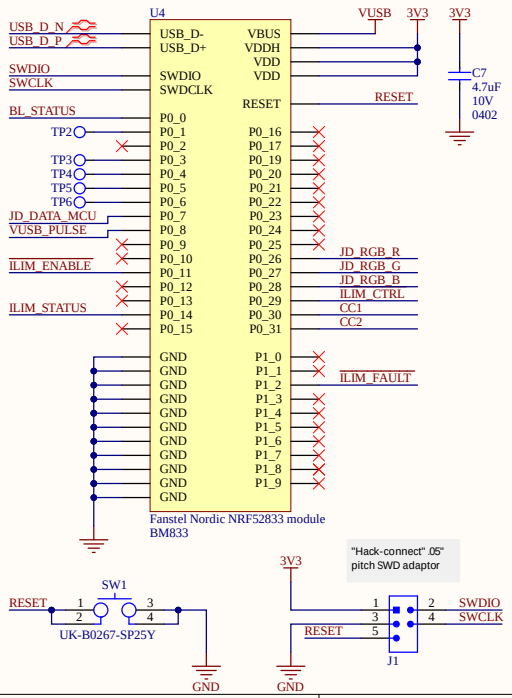
R6 sets 500 mA default current limit. Drive ILIM_ENABLE low in default mode (500mA). When ILIM_CTRL is driven HIGH or left floating, R5 decreases resistance to 28k, increasing current limit to 900 mA.

Mounting holes

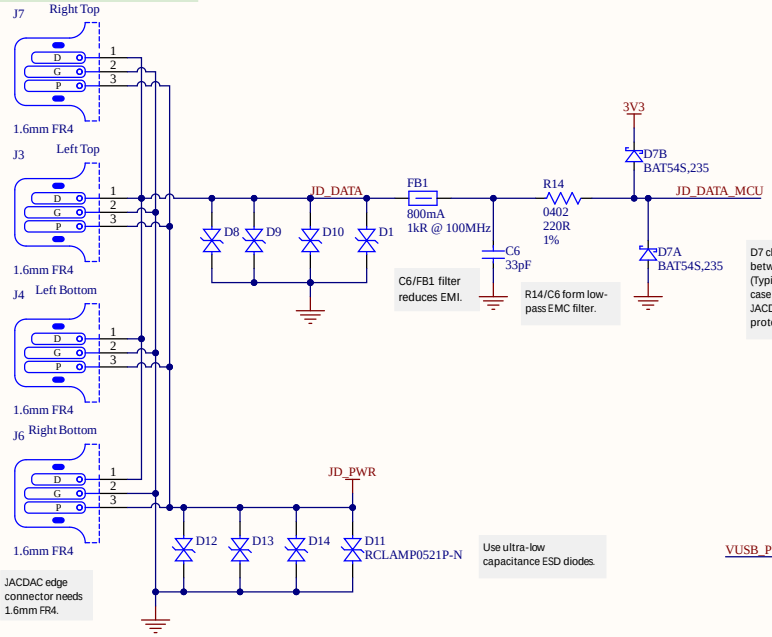


JACDAC mounting holes plated through hole, finished diameter of 2.2mm and annular ring of 3.2mm diameter.

Jacdac Brain



JACDAC interface



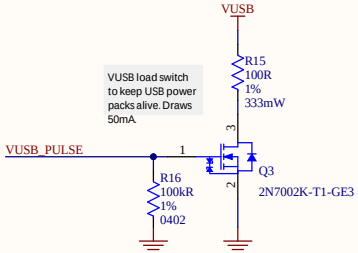
C6/FB1 filter reduces EMI.

R14/C6 form low-pass EMC filter.

D7 clamps JD_DATA between GND and VCLAMP (Typically MCU voltage) in case of out-of-range JACDAC bus voltages to protect MCU.

Use ultra-low capacitance ESD diodes.

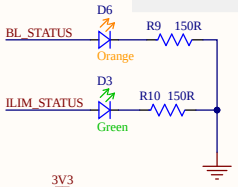
JACDAC edge connector needs 1.6mm FR4.

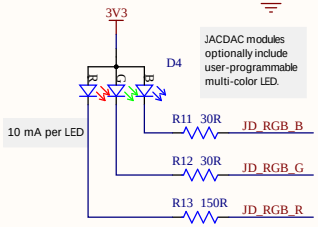


VUSB load switch to keep USB power packs alive. Draws 50mA.

Status LEDs

D6
Alternative part
SML-D12D
E6C0603SEAC1UDA
NCD0603O1





JACDAC modules optionally include user-programmable multi-color LED.

BroadcomLimited HSMF-C114 RGB is footprint-compatible alternative for D11.

Silkscreen & layout notes

Block name

Design notes

Microsoft	PROJECT DESCRIPTION: Jacdac NRF52833 brain 4 port					SHEET DESCRIPTION: complete design	
SHEET FILENAME: JacdacBrainNRF 57.SchDoc	PROJECT FILENAME: JacdacBrainNRF 57.PrjPCB	PROJECT CODENAME: JacdacBrainNRF	LICENCE: Attribution 4.0 International (CC BY 4.0)	LAST MODIFIED: 03/08/2021	PAGE: 1 OF 1	DRAWN BY: JD, SH & DG	REVISION: 0.1 PCB ID: 57-0.1