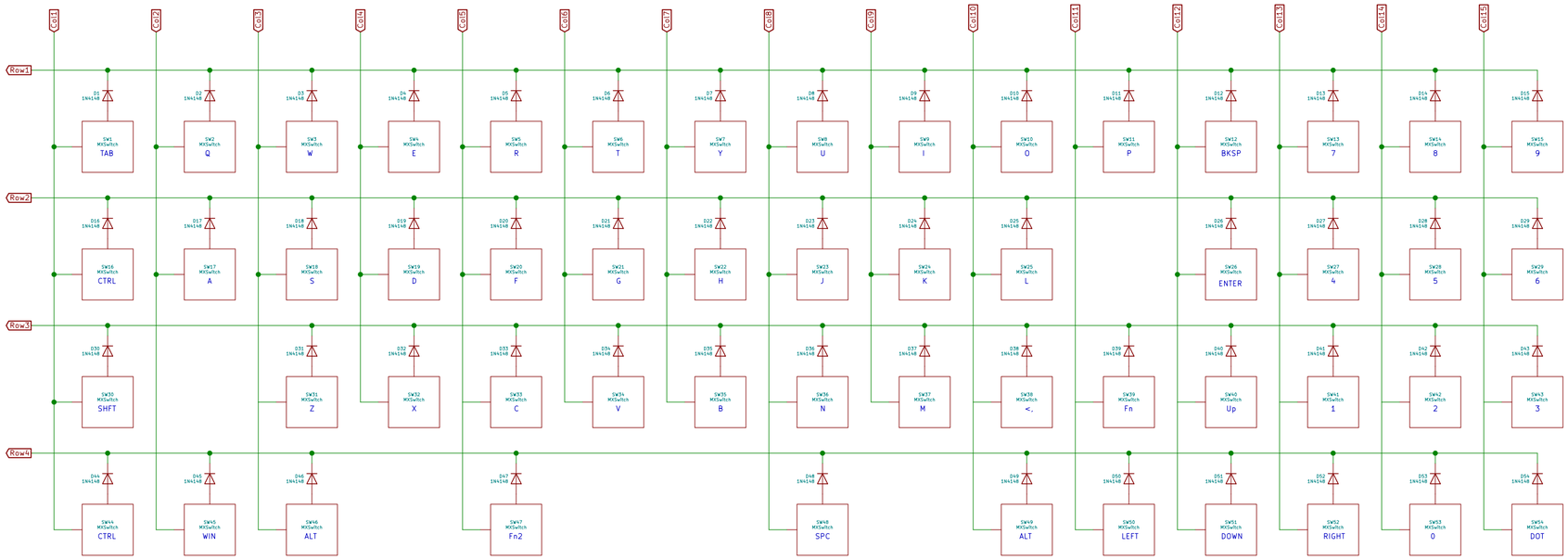
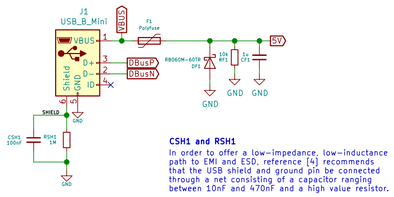
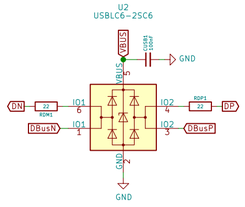




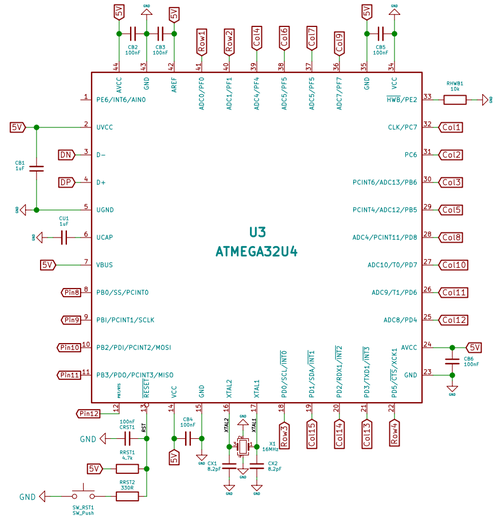
CSH1 and RSH1

In order to offer a low-impedance, low-inductance path to EMI and ESD, reference [4] recommends that the USB shield and ground pin be connected through a net consisting of a capacitor ranging between 10nF and 470nF and a high value resistor.



CUSB1

Reference [5] recommends that this capacitor be attached for decoupling



CX1/2 capacitors:

Crystal load capacitors. Thedatasheet [3] recommends a 8pF value. The 8.2pF value was used because it was more commonly found.

CBx capacitors:

Decoupling or bypass capacitors.
The AN2519 [2] indicates that the typical decoupling capacitor values are 100nF for analog voltage. It also recomends that the main VCC voltage be decoupled, but does not ecommend a value for this. The value used was 1uF.

CU1

CU1: this is the UCAP pin capacitor.
The MCU datasheet [1] specifies that this pin should be connected to an external 1uF capacitor.

RESET NETWORK

The reset network added was taken directly from Application Note [2]. See section 3 for details.

RHWB1

Datasheet [1] recommends that the HWB pin be connected to GNd through a 1k resistor.

REFERENCES

[1] ATMEGA32U4 datasheet
http://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-7766-8-bit-AVR-ATmega16U4-32U4_Datasheet.pdf

[2] AN2519 Application Note: AVR® Microcontroller Hardware Design Considerations
http://ww1.microchip.com/downloads/en/AppNotes/AN2519-AVR-Microcontroller-Hardware-Design-Considerations-00002519B.pdf

[3] NX5032GC 16MHz crystal datasheet
https://www.ndk.com/images/products/catalog/c_NX5032GC-STD-CSK-6_e.pdf

[4] AN232B-06 Application Note
https://www.ftdichip.com/Support/Documents/AppNotes/AN232B-06_11.pdf

[5] USBLC6-2 Datasheet
https://www.st.com/resource/en/datasheet/usblc6-2.pdf

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