Switch Matrix

Row1
Row2
Row3
Row4

Col1 Col2 Col3 Col4 Col5 Col6 Col7 Col8 Col9 Col10 Col11 Col12 Col13 Col14 Col15

(Switch labels, Row1): TAB Q W E R T Y U O P BKSP 7 8 9
(Row2): CTRL A S D F G H J K L ENTER 4 5 6
(Row3): SHFT Z X C V B N M <, Fn Up 1 2 3
(Row4): CTRL WIN ALT Fn2 SPC ALT LEFT DOWN RIGHT 0 DOT

USB Connector
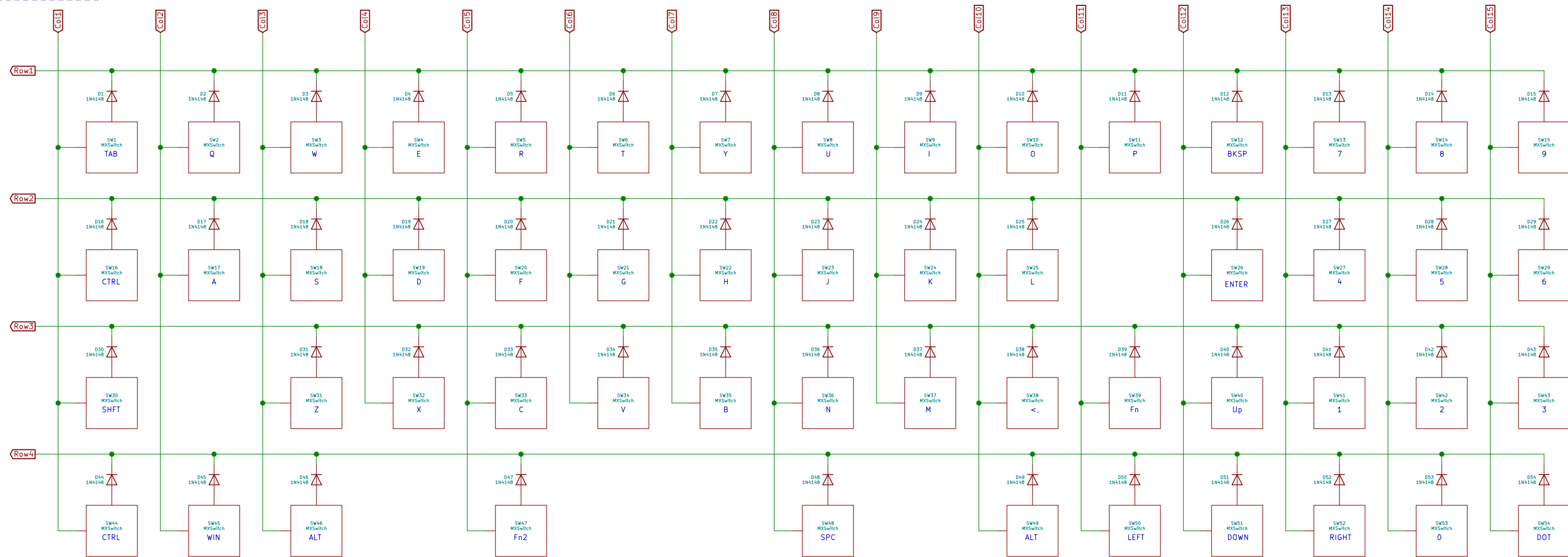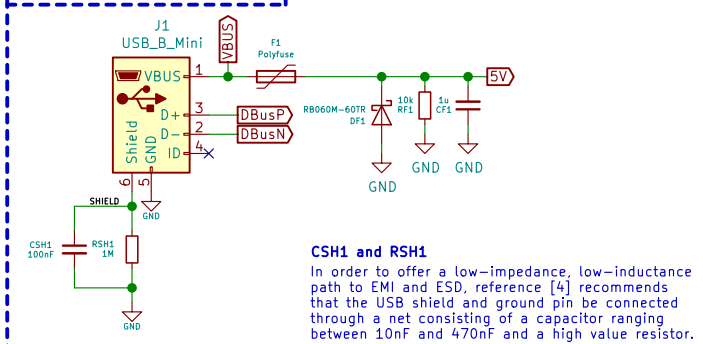
J1 USB_B_Mini
F1 Polyfuse
5V
RB06M-60TR
GND GND GND
SHIELD
CSHG 100U
RSH1 1M
GND

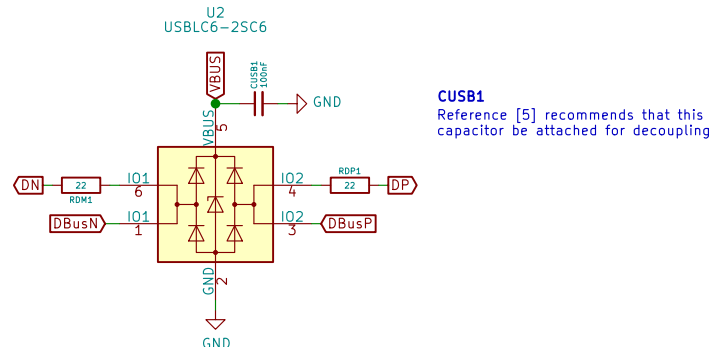**CSH1 and RSH1**
In order to offer a low-impedance, low-inductance path to EMI and ESD, reference [4] recommends that the USB shield and ground pin be connected through a net consisting of a capacitor ranging between 10nF and 470nF and a high value resistor.

ESD protection

U2 USBLC6-2SC6

CUSB1
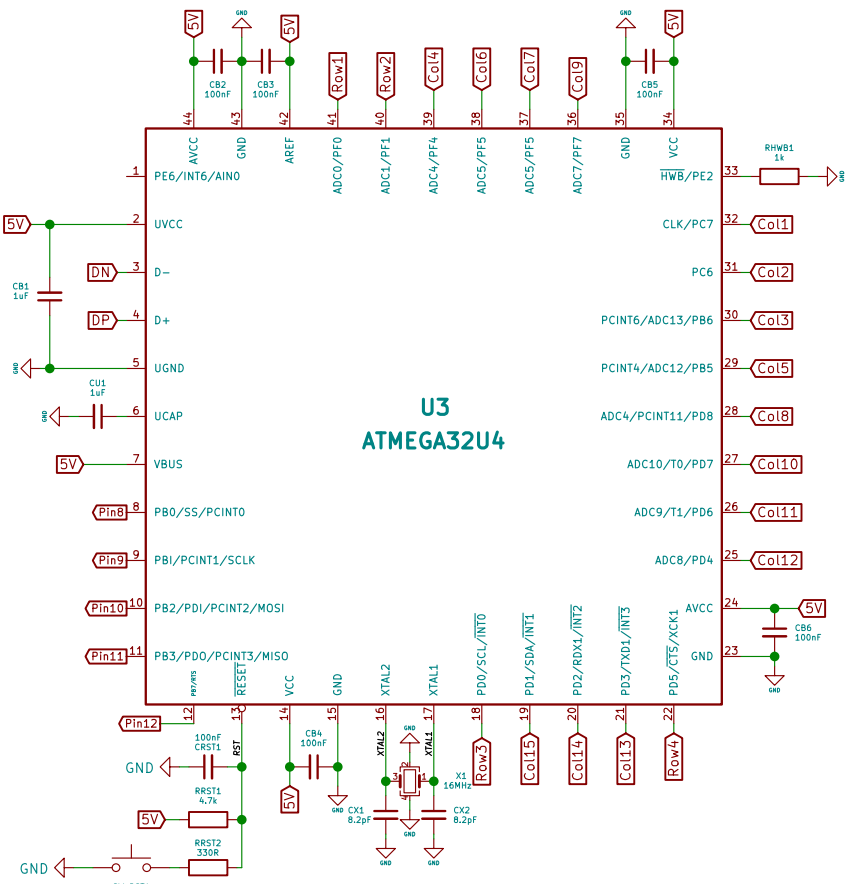Reference [5] recommends that this capacitor be attached for decoupling.

GND

Logos

L1 AcheronLogo
L2 ElongateLogoPlated
L3 ElongateLabel
L4 ElongateLabelMask
L5 OSHLogo
L6 BRFlag

Extra pins

J2 Conn_01x06_Female
GND Pin7 Pin9 Pin10 Pin8 Pin6

MCU Shenanigans

U3 ATMEGA32U4

PE6/INT6/AIN0
UVCC
D-
D+
UGND
UCAP
VBUS
PB0/SS/PCINT0
PB1/PCINT1/SCLK
PB2/PDI/PCINT2/MOSI
PB3/PDO/PCINT3/MISO

AVCC GND AREF
HWB/PE2
CLK/PC7 — Col1
PC6 — Col2
PCINT6/ADC13/PB6 — Col3
PCINT4/ADC12/PB5 — Col5
ADC4/PCINT11/PD8 — Col8
ADC10/T0/PD7 — Col10
ADC9/T1/PD6 — Col11
ADC8/PD4 — Col12
AVCC — 5V

RHWB1 1k

CX1/2 capacitors:
Crystal load capacitors. The datasheet [3] recommends a 8pF value. The 8.2pF value was used because it was more commonly found.

C8x capacitors:
Decoupling or bypass capacitors.
The AN2519 [2] indicates that the typical decoupling capacitor values are 100nF for analog voltage. It also recommends that the main VCC voltage be decoupled, but does not recommend 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

Designed by Gondolindrim and MrKeebs
Sheet: /
File: elongate.sch
Title: ElongatePCB
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KiCad E.D.A. kicad 5.1.4   Id: 1/1