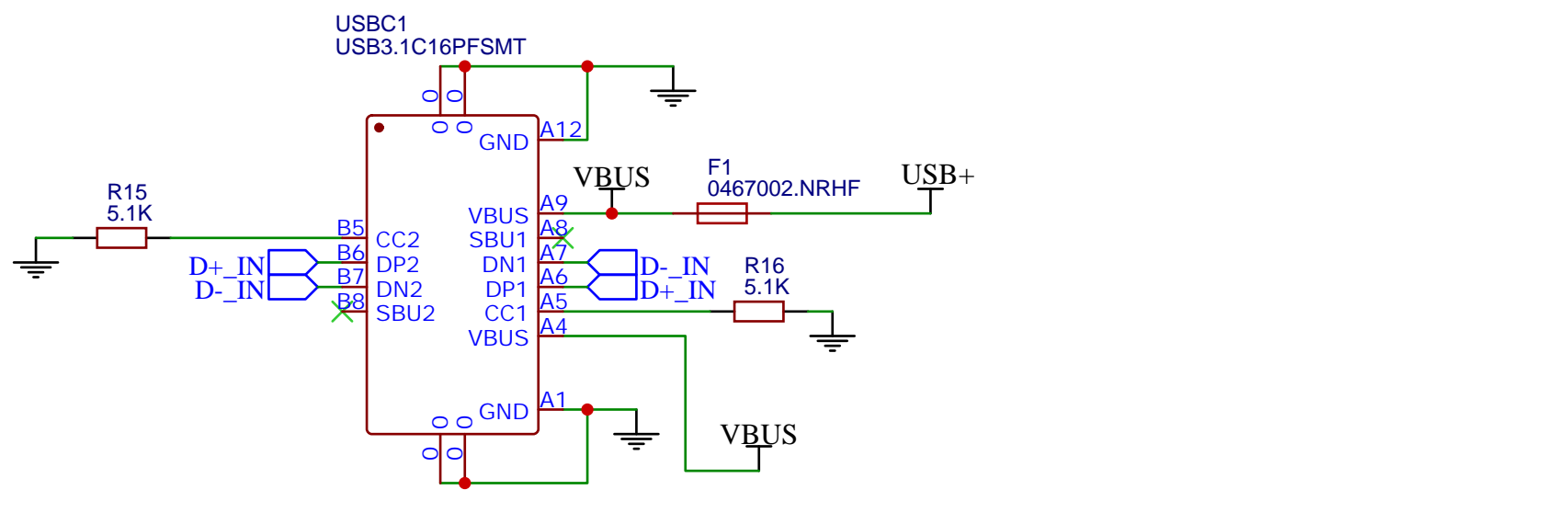
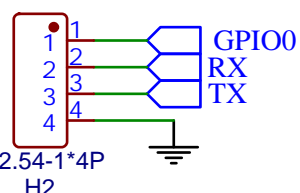
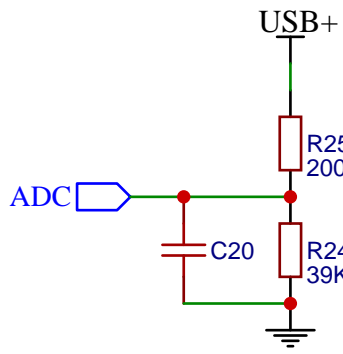


GPIO4, GPIO5 and GPIO12 are unused in the design and perfect for any use.

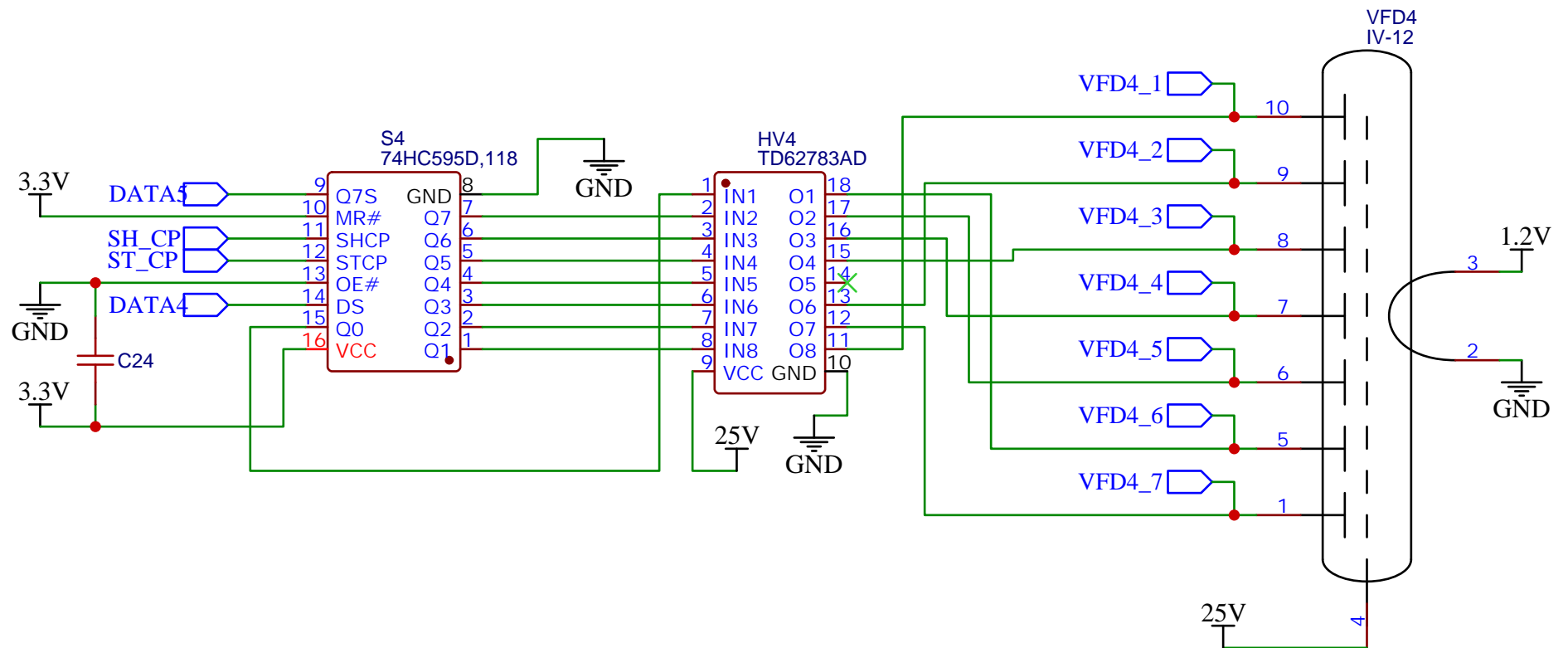
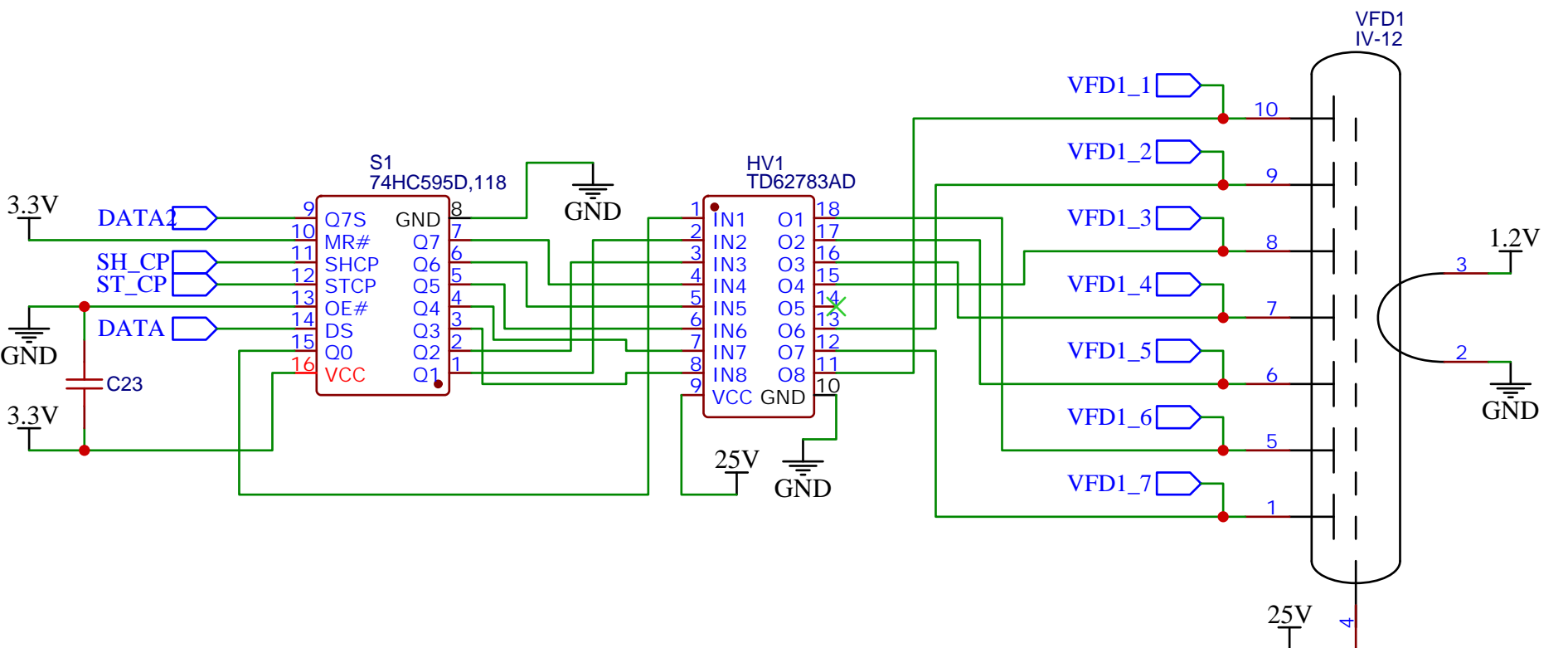


Micro USB + ESD protection

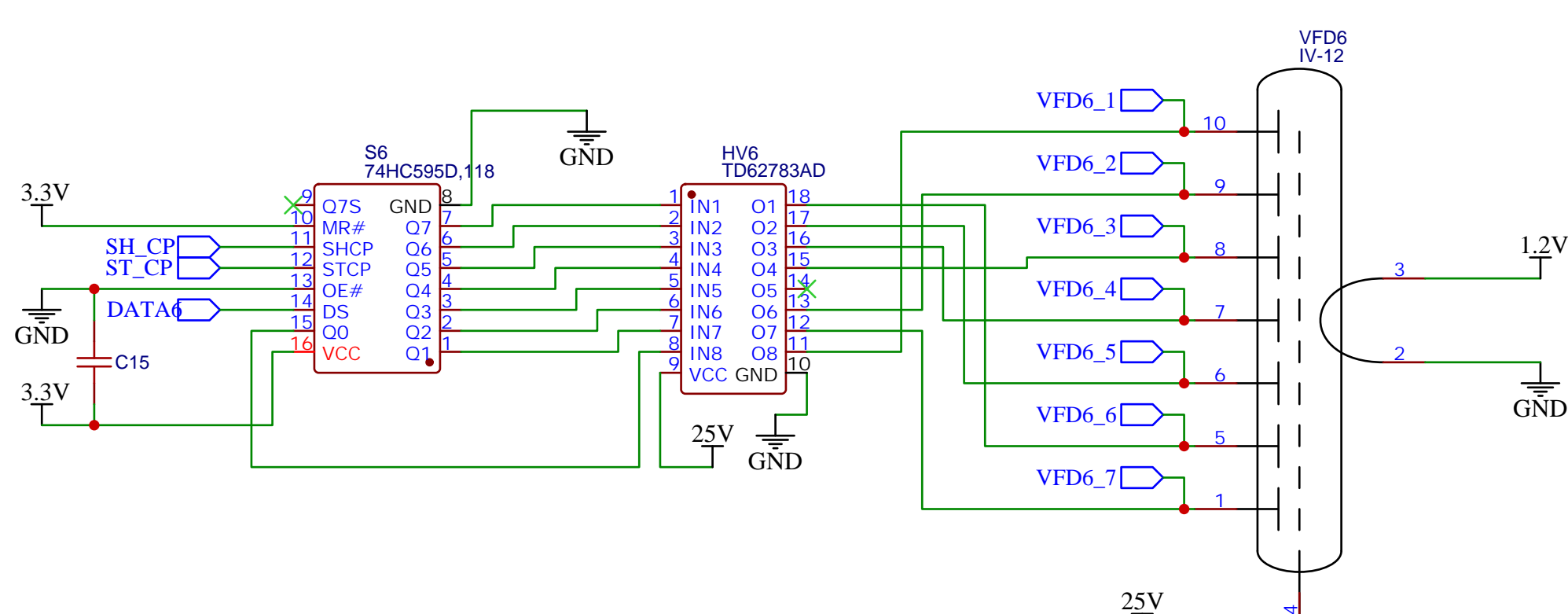
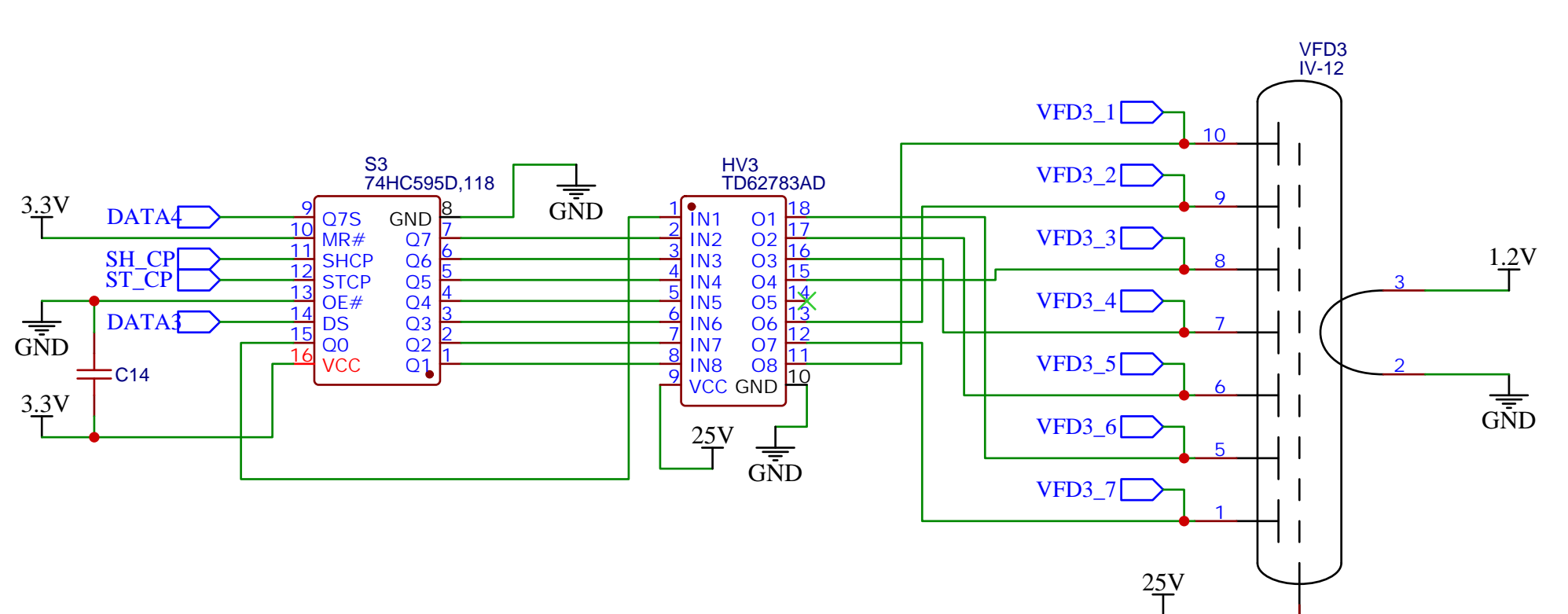
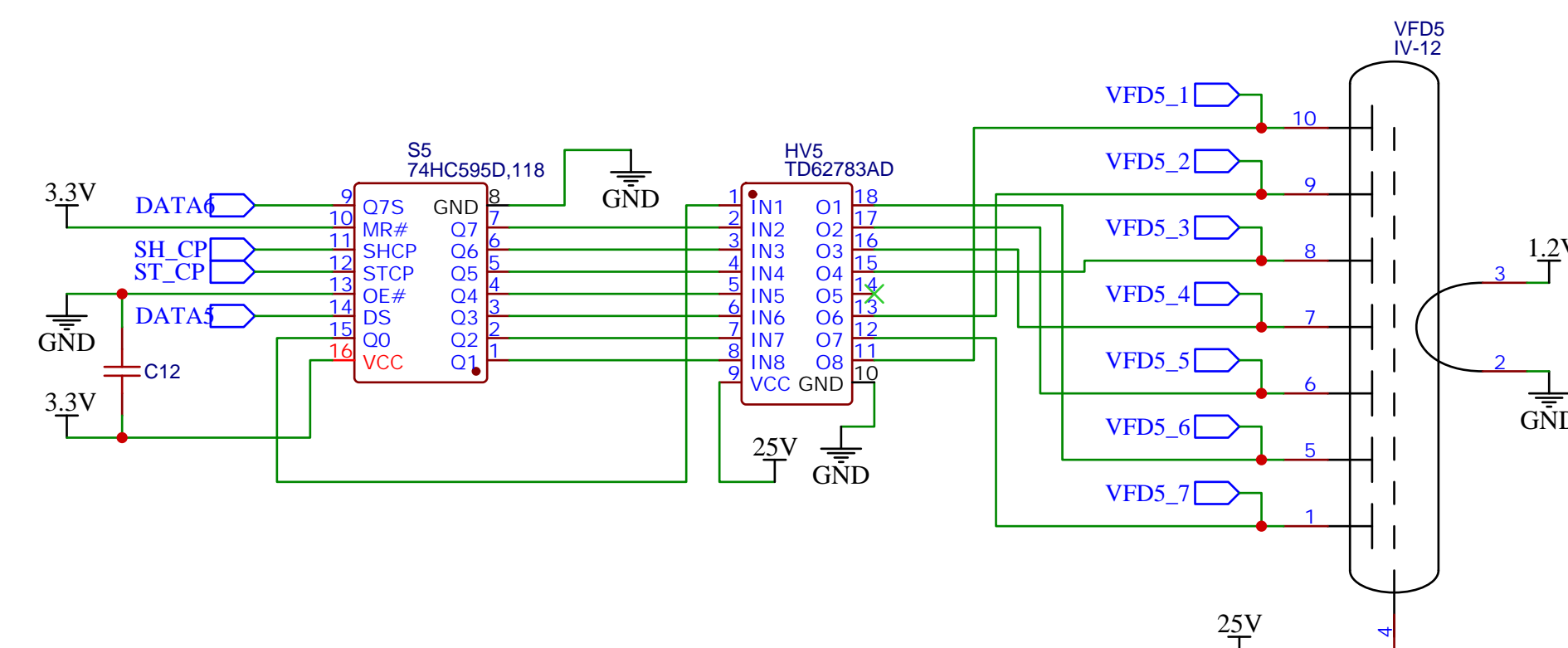
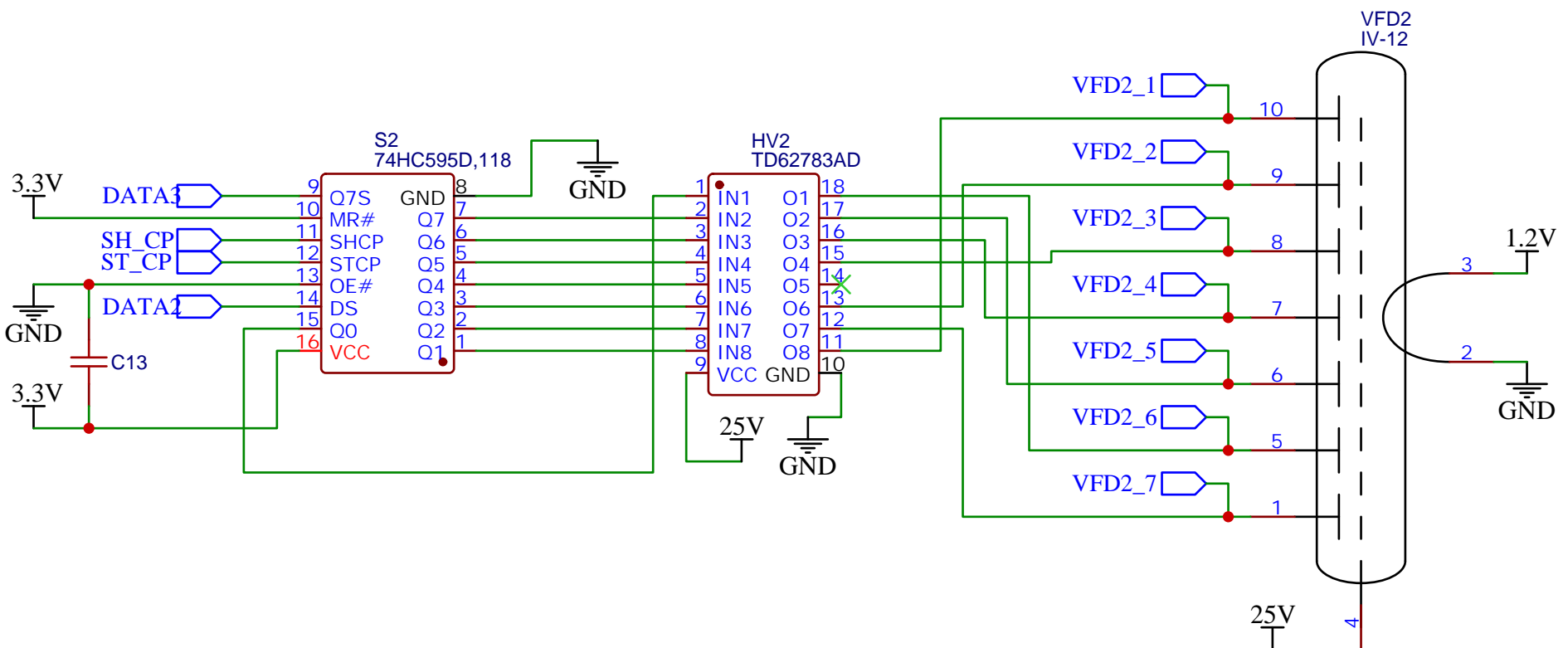
USB voltage sensing (just for fun)



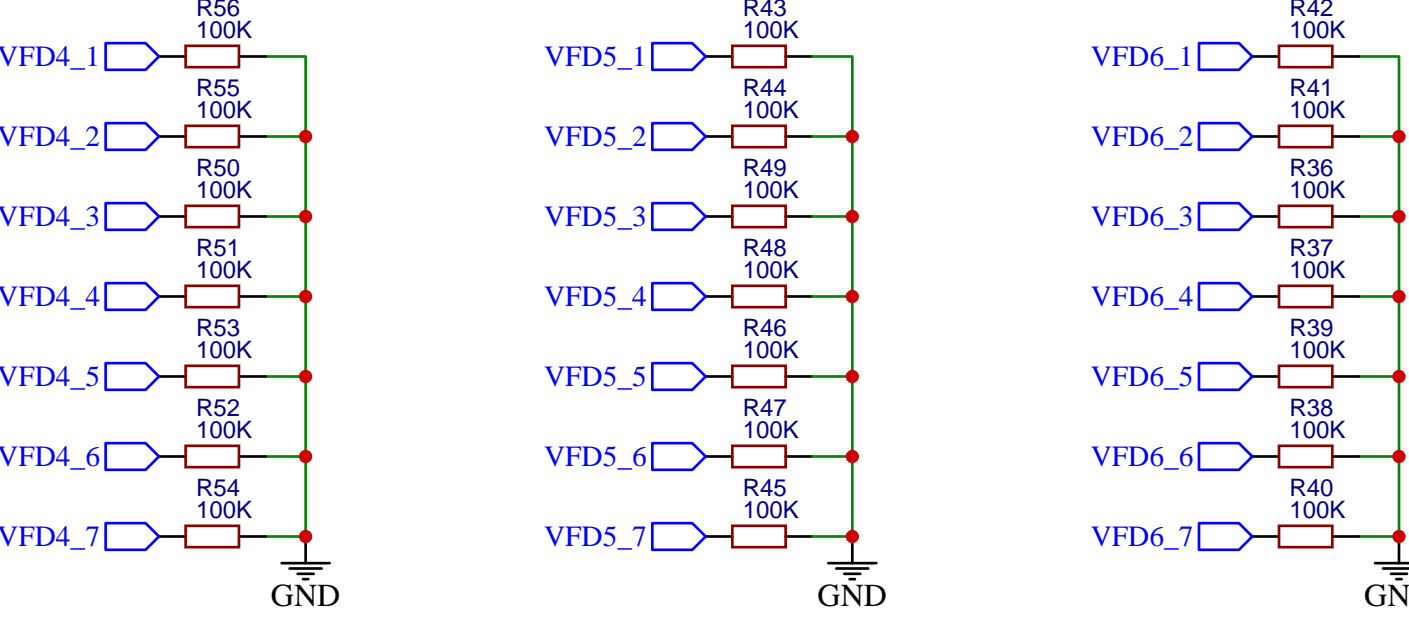
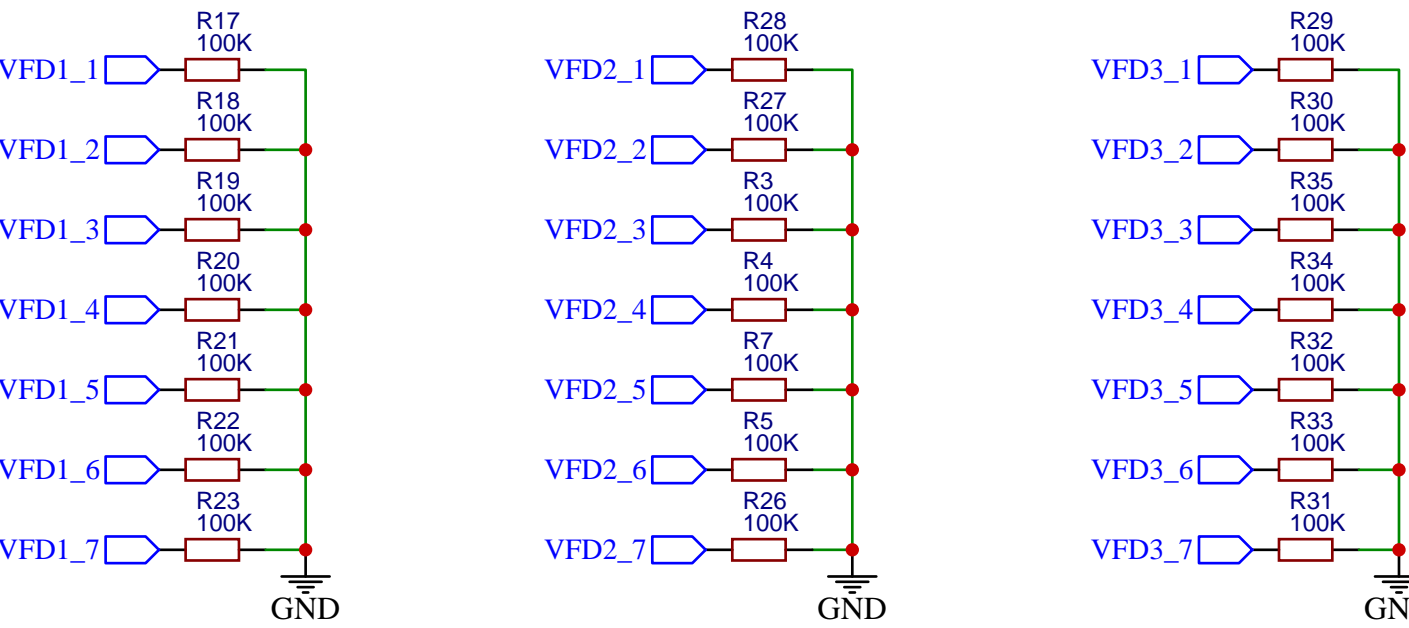
VFD + shift registers



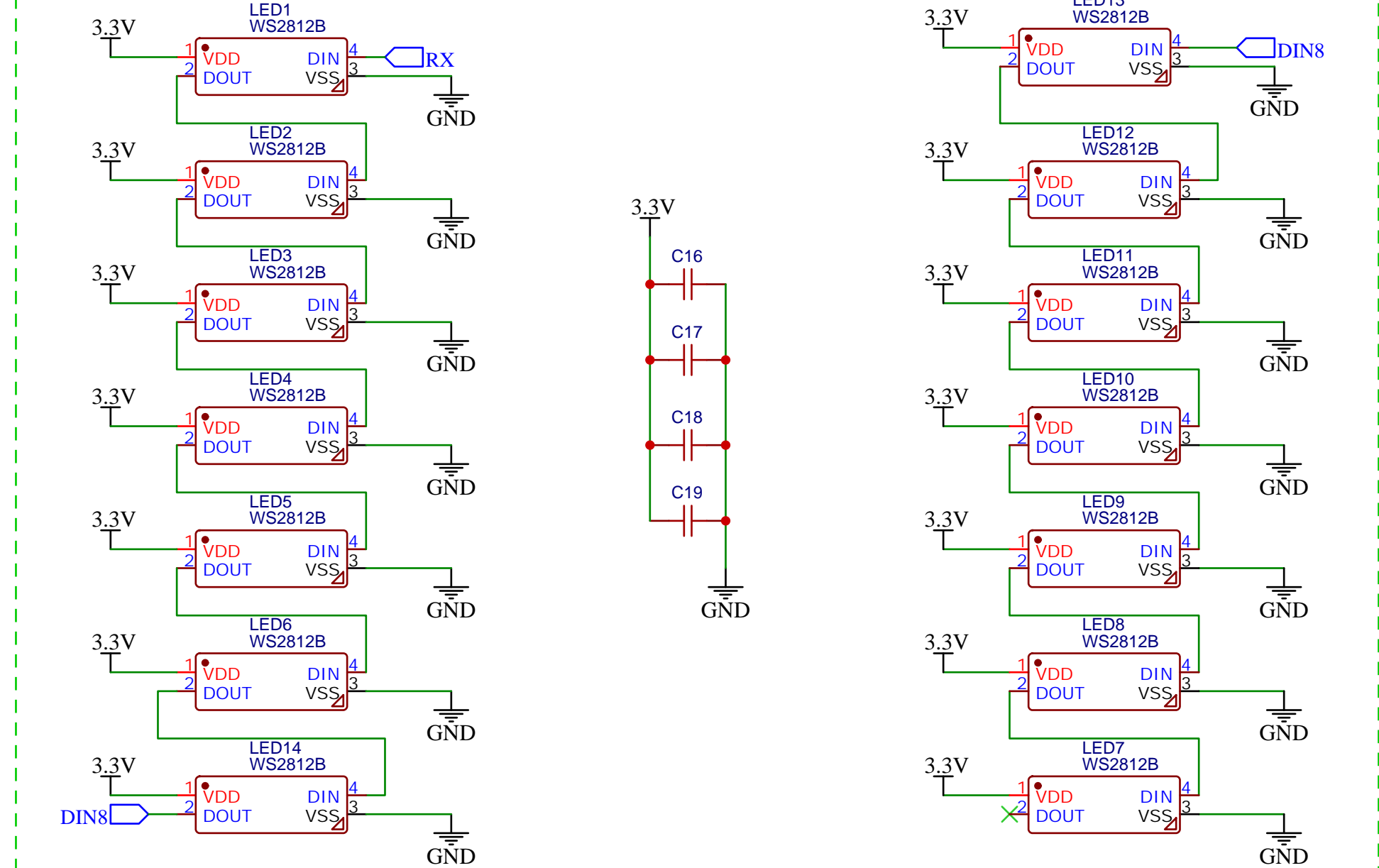
TBD62783AFG (C97745) is a modern pin-compatible replacement with lower power consumption, recommended! Cheap chinese 1:1 clone XL62783 also available (C556260)
KID65783AF-EL/P (lisc part no. C125259) can be also used but PCB change is required (20pin package vs 18pin package)



Pulldown resistors, solder only for segments that don't turn fully off to save power

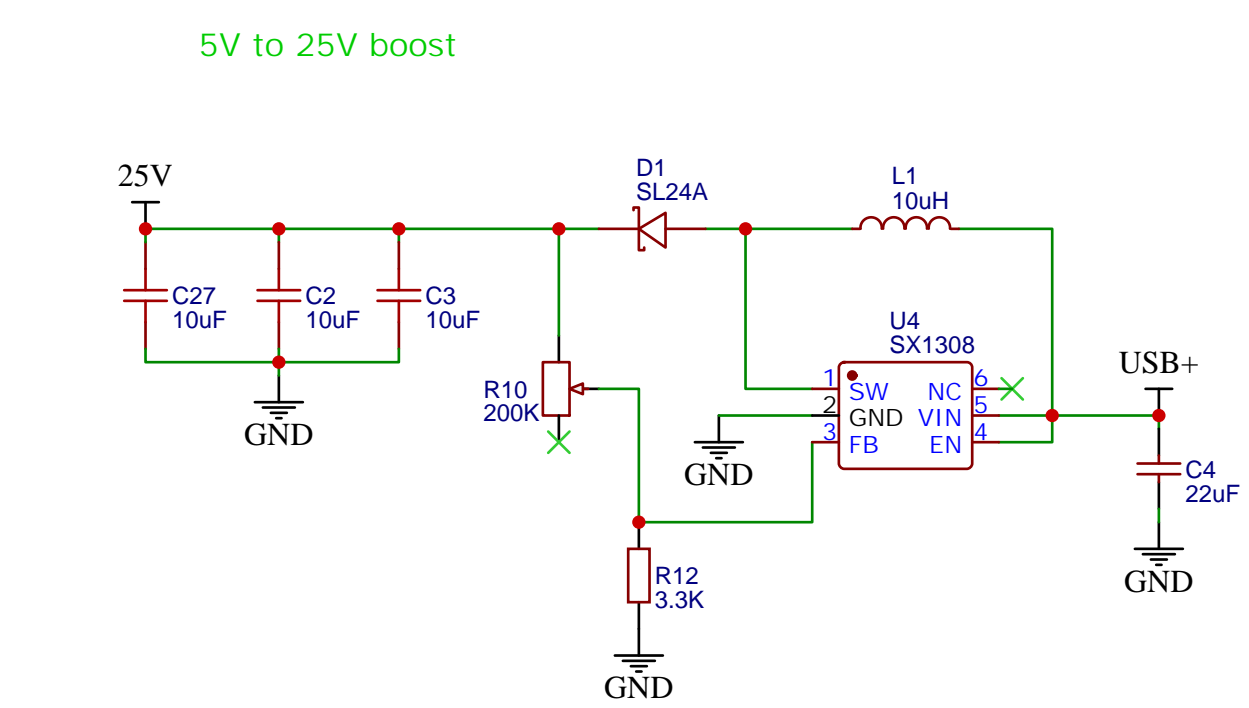


Colon leds



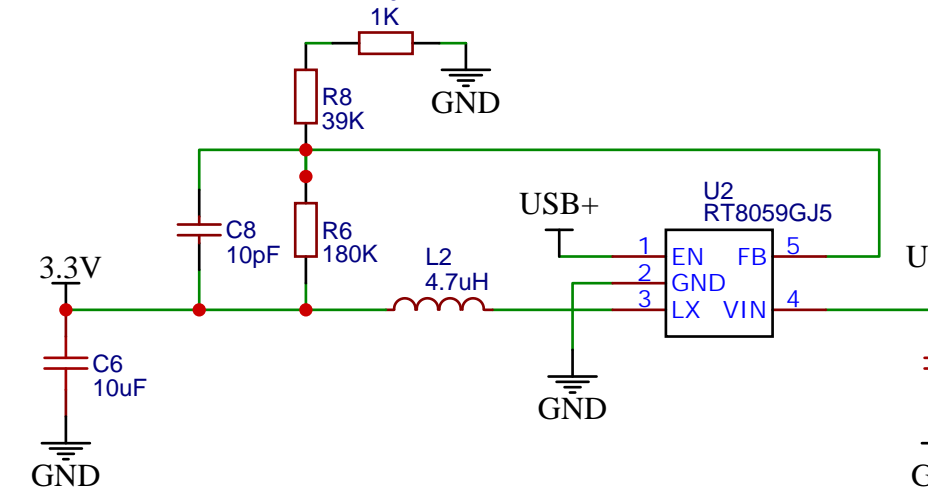
Powered from 3.3V for lower brightness + no level shifter required. Out of spec but tested on several different chips
Depending on exact chip used, you will have to adjust colors in the sketch
WS2812B are almost too bright. WS2812C (lisc C114587) recommended for lower max brightness.

3.3V, 25V, 1.2V voltages

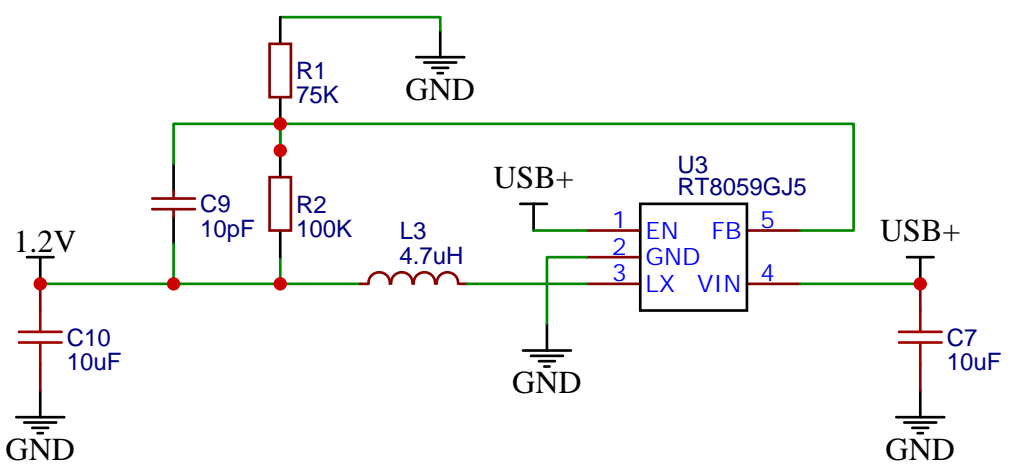


Absolute max voltage is 28V but make sure to stay below 25V
I suggest to use voltages in the range of 18V to 23V
SX1308 or MT3608 can be used

5V to 3.3V step-down



Filament step-down



100K R2 + 75K R1 => 1.0V
100K R2 + 100K R1 => 1.2V
75K R2 + 100K R1 => 1.4V (recommended for IV-12)