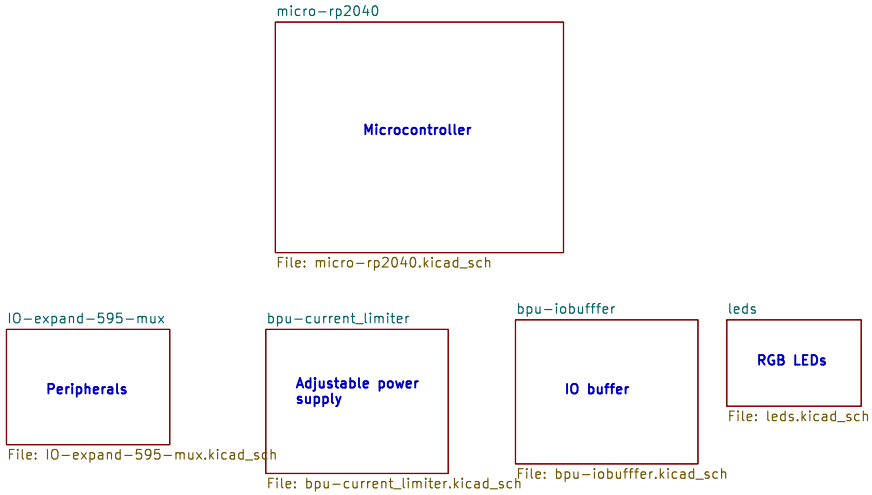

Sheet: / File: 6-REV2b.kicad_sch		
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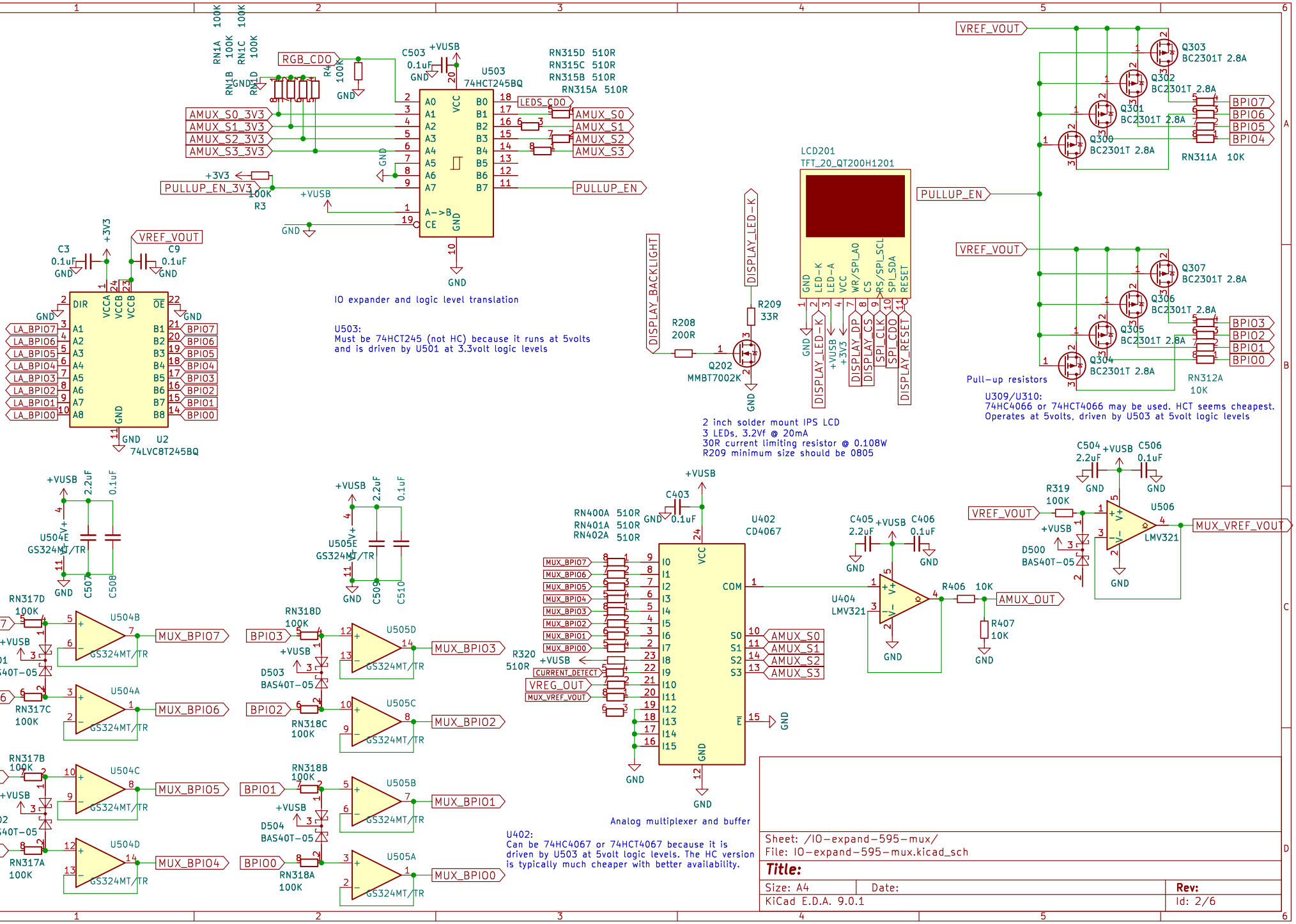
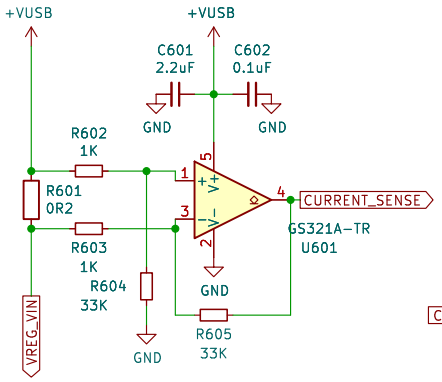
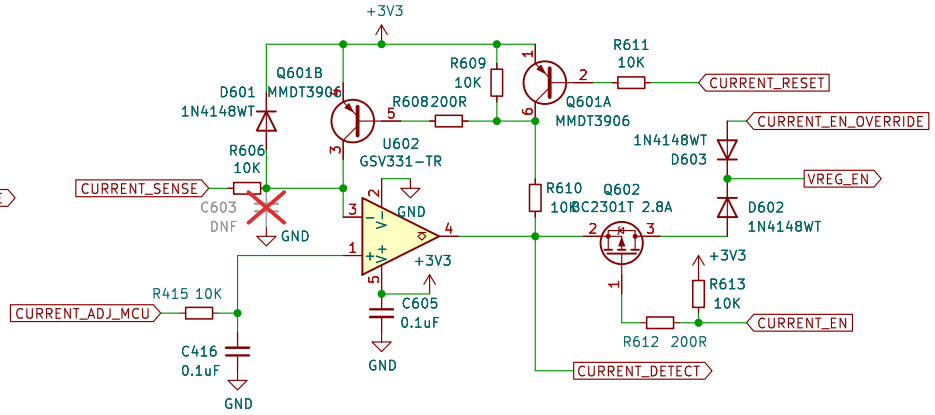
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.1		Id: 1/6


RN1A 100K
RN1B 100K
RN1C 100K
RN1D 100K
RGB_CDO
R4 100K
GND
C503 0.1uF
+VUSB
U503
74HCT245BQ
RN315D 510R
RN315C 510R
RN315B 510R
RN315A 510R
LEDS_CDO
AMUX_S0_3V3
AMUX_S1_3V3
AMUX_S2_3V3
AMUX_S3_3V3
AMUX_S0
AMUX_S1
AMUX_S2
AMUX_S3
+3V3
PULLUP_EN_3V3
100K
R3
PULLUP_EN
IO expander and logic level translation
U503:
Must be 74HCT245 (not HC) because it runs at 5volts
and is driven by U501 at 3.3volt logic levels
C3 0.1uF
C9 0.1uF
VREF_VOUT
U2
74LVC8T245BQ
LA_BPIO7
LA_BPIO6
LA_BPIO5
LA_BPIO4
LA_BPIO3
LA_BPIO2
LA_BPIO1
LA_BPIO0
BPIO7
BPIO6
BPIO5
BPIO4
BPIO3
BPIO2
BPIO1
BPIO0
LCD201
TFT_20_QT200H1201
DISPLAY_BACKLIGHT
DISPLAY_LED-K
R208 200R
R209 33R
Q202
MMBT7002K
2 inch solder mount IPS LCD
3 LEDs, 3.2Vf @ 20mA
30R current limiting resistor @ 0.108W
R209 minimum size should be 0805
Q303 BC2301T 2.8A
Q302 BC2301T 2.8A
Q301 BC2301T 2.8A
Q300 BC2301T 2.8A
RN311A 10K
Q307 BC2301T 2.8A
Q306 BC2301T 2.8A
Q305 BC2301T 2.8A
Q304 BC2301T 2.8A
RN312A 10K
Pull-up resistors
U309/U310:
74HC4066 or 74HCT4066 may be used. HCT seems cheapest.
Operates at 5volts, driven by U503 at 5volt logic levels
U504E GS324MT/TR
U505E GS324MT/TR
C504 2.2uF
C506 0.1uF
R319 100K
U506 LMV321
D500 BAS40T-05
MUX_VREF_VOUT
RN317D 100K
RN318D 100K
U504B
U505D
D501 BAS40T-05
D503 BAS40T-05
MUX_BPIO7
MUX_BPIO6
MUX_BPIO5
MUX_BPIO4
MUX_BPIO3
MUX_BPIO2
MUX_BPIO1
MUX_BPIO0
RN317C 100K
RN318C 100K
U504A
U505C
RN317B 100K
RN318B 100K
U504C
U505B
D502 BAS40T-05
D504 BAS40T-05
RN317A 100K
RN318A 100K
U504D
U505A
GS324MT/TR
C403 0.1uF
U402
CD4067
RN400A 510R
RN401A 510R
RN402A 510R
R320 510R
CURRENT_DETECT
VREG_OUT
C405 2.2uF
C406 0.1uF
U404 LMV321
R406 10K
R407 10K
AMUX_OUT
Analog multiplexer and buffer
U402:
Can be 74HC4067 or 74HCT4067 because it is
driven by U503 at 5volt logic levels. The HC version
is typically much cheaper with better availability.
Sheet: /IO-expand-595-mux/
File: IO-expand-595-mux.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.1
Id: 2/6

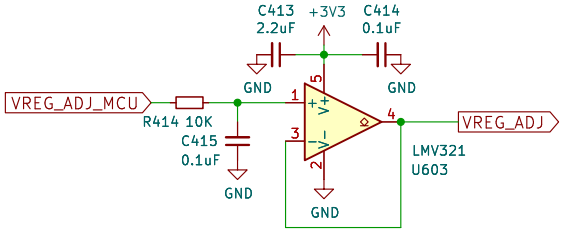


Current sense

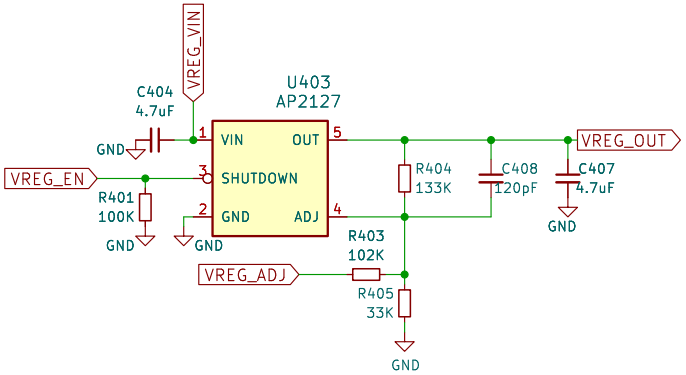


Current limit

Q601 is a general purpose dual PNP transistor with EBCEBC pinout.
Matched pair Q401 can be substituted here, but Q401 is more expensive.



Buffer circuit for Voltage Adjust, when using the MCU
to do PWM instead U406 as DAC

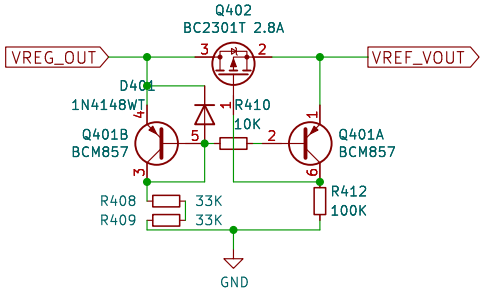


Adjustable voltage regulator

MCP1824 and AP2127 can be used, but have different reference voltages.

MCP1824: Ideal R403/R404/R405 = 77.96K/99.22K/10K
Closest values are 78K/100K/10K

AP2127: Ideal R403/R404/R405 = 31.25K/39.77K/10K
Closest values are 31.6K/40.2K/10K



Backflow prevention

Q401 is a matched PNP pair with EBCEBC pinout.
BCM857, BCM856, NST45010MW6T1G can be substituted.
The BCM part numbers are made by several manufacturers.
This part may be substituted in Q601, but it costs significantly more.

DMMT3906, PMP5201, PMP5501 are similar but have a BBCEEC pinout.
These can be substituted with minor changes to the PCB.

Sheet: /bpu-current_limiter/
File: bpu-current_limiter.kicad_sch

Title:

Size: A4	Date:	**Rev:**
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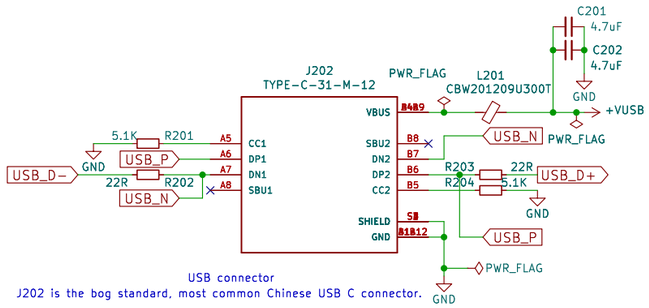
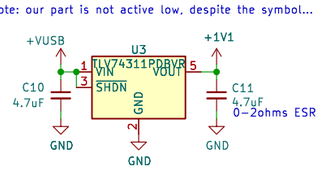
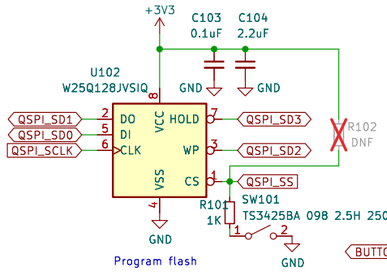


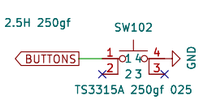
USB connector

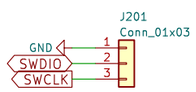
J202 is the bog standard, most common Chinese USB C connector.



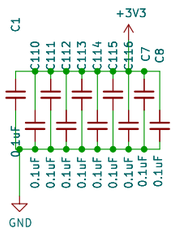
Note: our part is not active low, despite the symbol...

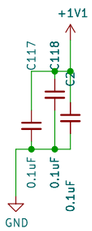


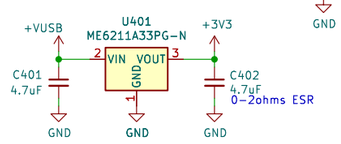


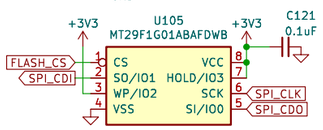


Programming header





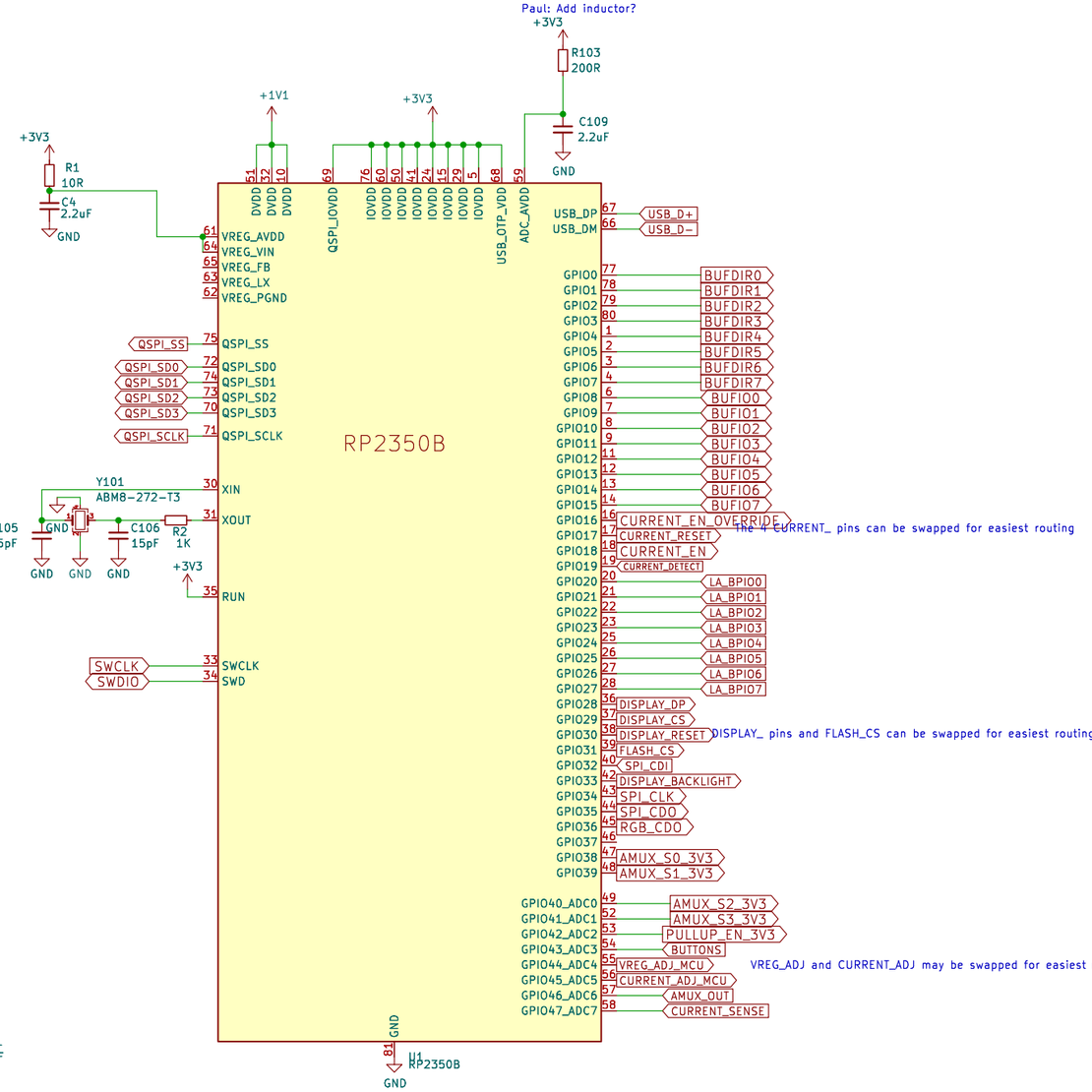




Power supply

Worst case power budget is 220mA during full buffer short.
Sized for 145mA max, 100mA typical.
C402 can be a ceremic capacitor with 0-2ohms ESR

Paul: Add inductor?



The 4 CURRENT_ pins can be swapped for easiest routing

DISPLAY_ pins and FLASH_CS can be swapped for easiest routing

VREG_ADJ and CURRENT_ADJ may be swapped for easiest routing

Sheet: /micro-rp2040/		
File: micro-rp2040.kicad_sch		
Title:		
Size: A3	Date:	**Rev:**
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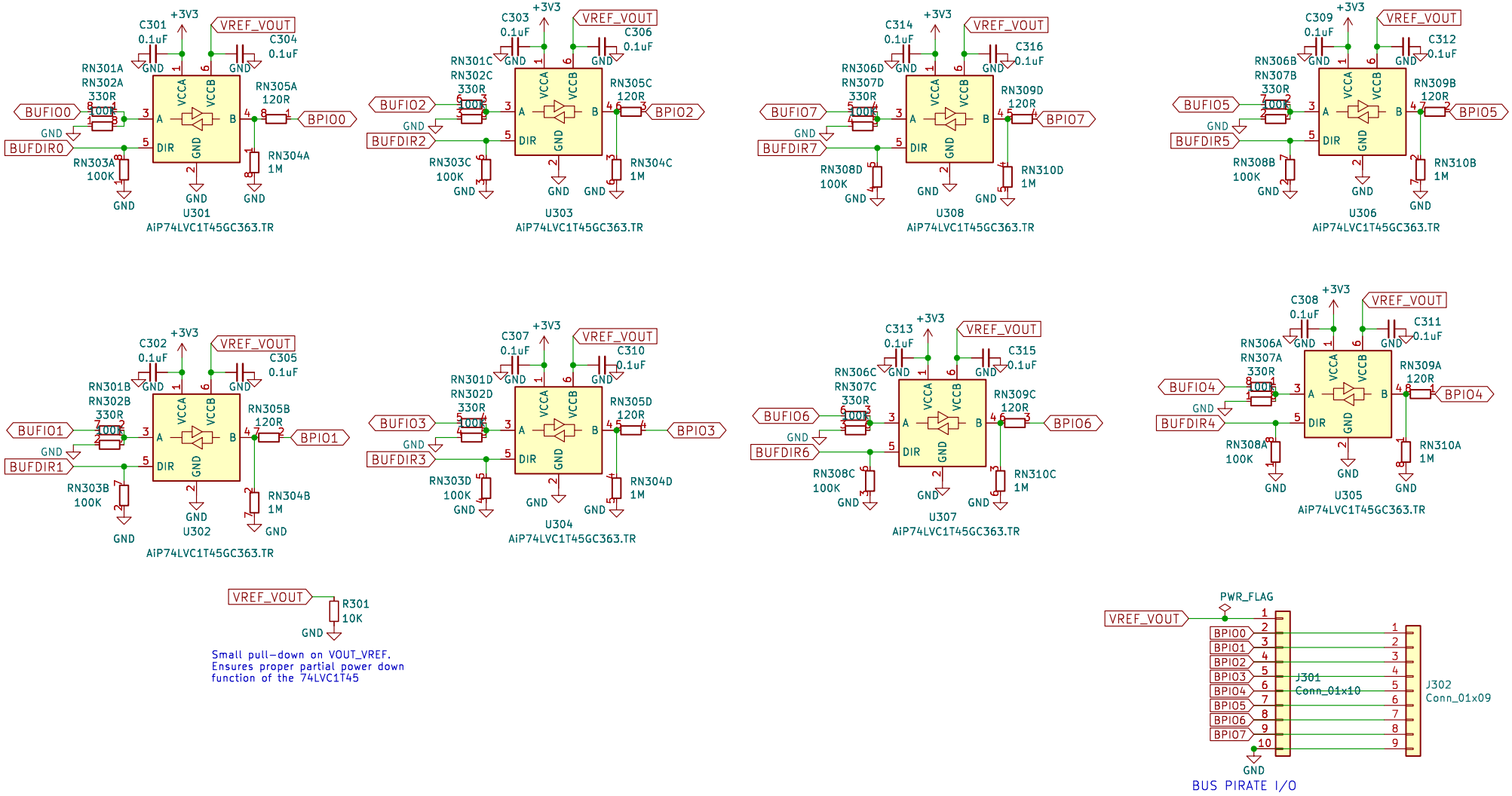

Sheet: /bpu-iobufffer/		
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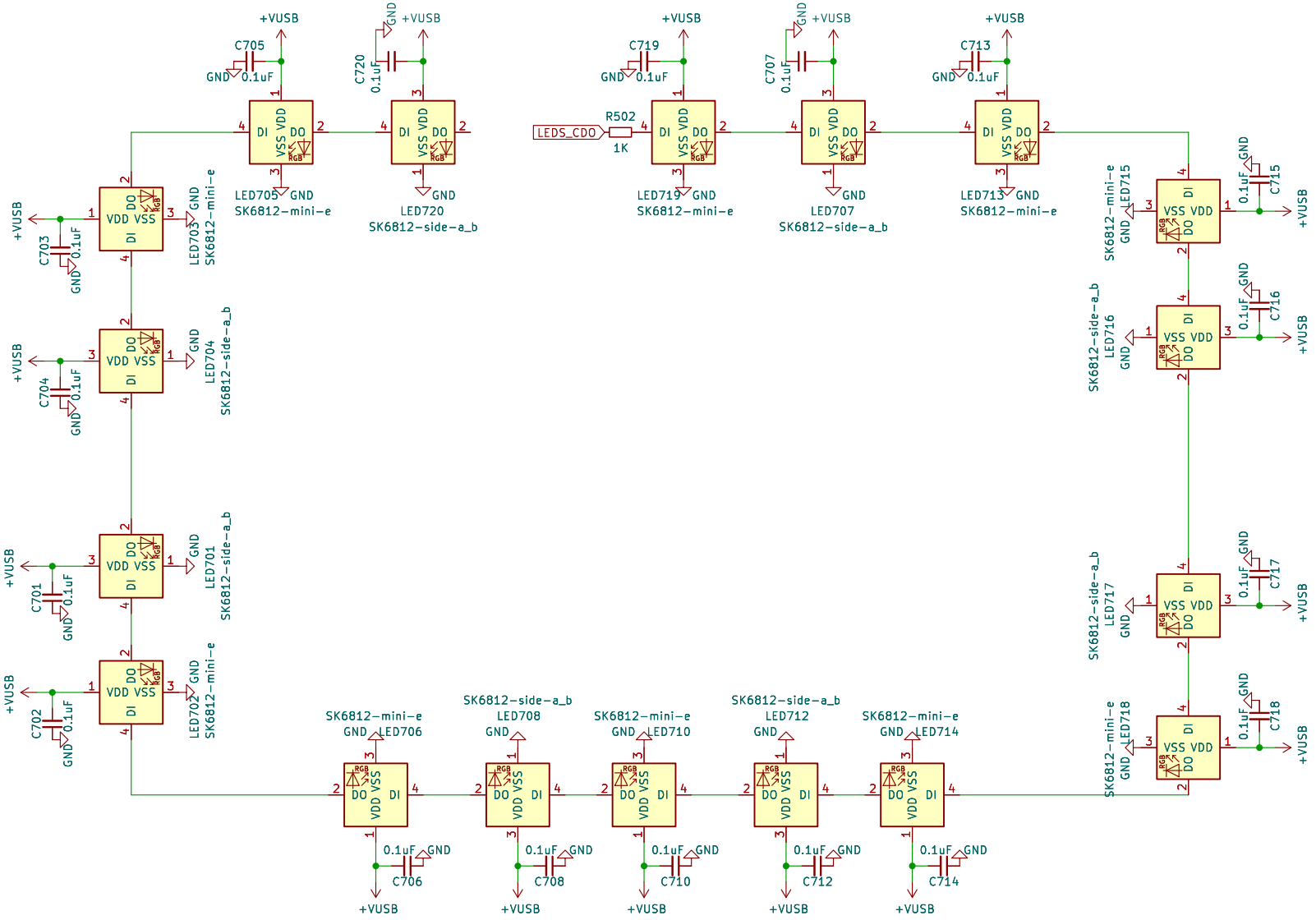
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.1		Id: 5/6



Sheet: /leds/		
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Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.1		Id: 6/6