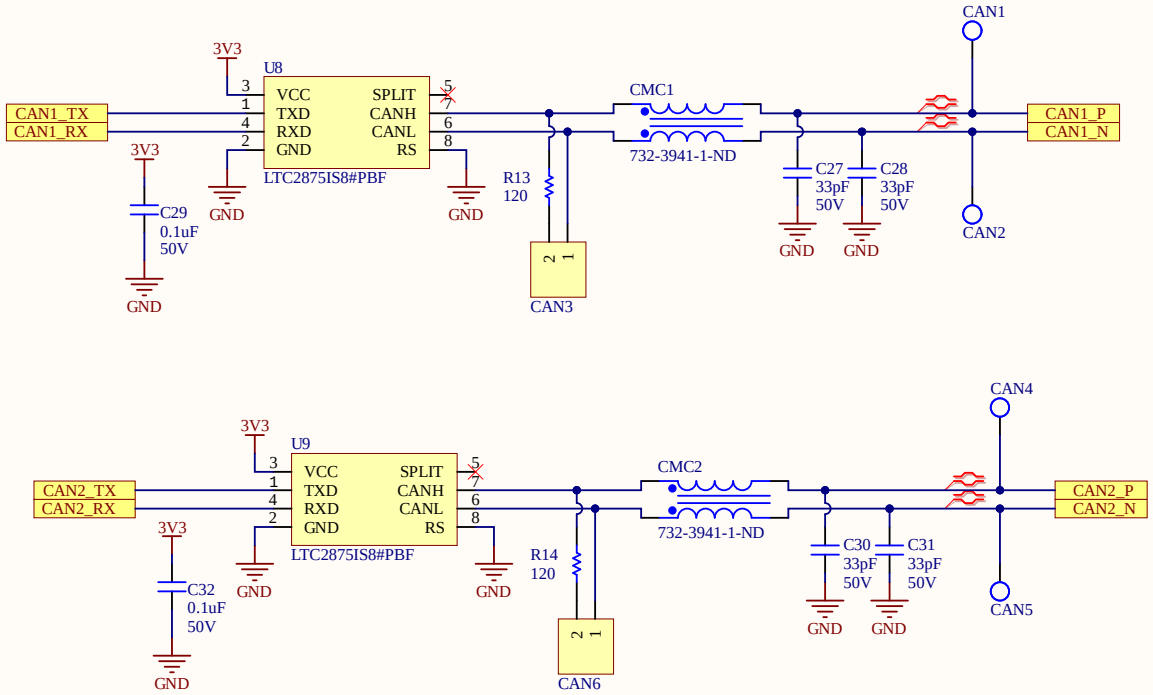

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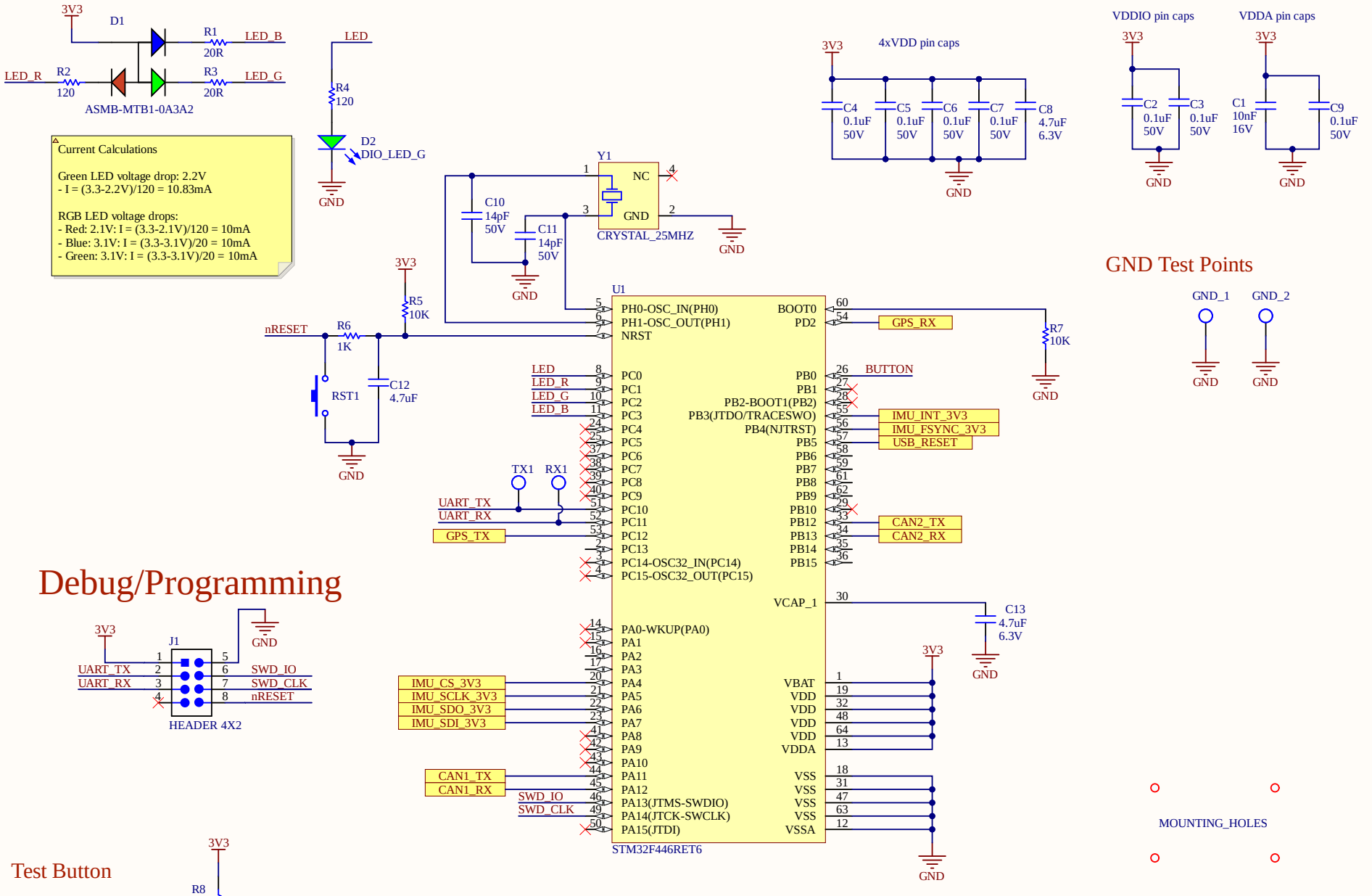
Test LEDs
3V3
D1
R1
20R
LED_B
LED_R
R2
120
R3
20R
LED_G
ASMB-MTB1-0A3A2
LED
R4
120
D2
DIO_LED_G
GND
Current Calculations
Green LED voltage drop: 2.2V
- I = (3.3-2.2V)/120 = 10.83mA
RGB LED voltage drops:
- Red: 2.1V: I = (3.3-2.1V)/120 = 10mA
- Blue: 3.1V: I = (3.3-3.1V)/20 = 10mA
- Green: 3.1V: I = (3.3-3.1V)/20 = 10mA
Y1
NC
GND
CRYSTAL_25MHZ
C10
14pF
50V
C11
14pF
50V
Decoupling Caps
4xVDD pin caps
C4
0.1uF
50V
C5
0.1uF
50V
C6
0.1uF
50V
C7
0.1uF
50V
C8
4.7uF
6.3V
VDDIO pin caps
C2
0.1uF
50V
C3
0.1uF
50V
VDDA pin caps
C1
10nF
16V
C9
0.1uF
50V
GND Test Points
GND_1
GND_2
U1
PH0-OSC_IN(PH0)
PH1-OSC_OUT(PH1)
NRST
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
PC11
PC12
PC13
PC14-OSC32_IN(PC14)
PC15-OSC32_OUT(PC15)
PA0-WKUP(PA0)
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13(JTMS-SWDIO)
PA14(JTCK-SWCLK)
PA15(JTDI)
BOOT0
PD2
PB0
PB1
PB2-BOOT1(PB2)
PB3(JTDO/TRACESWO)
PB4(NJTRST)
PB5
PB6
PB7
PB8
PB9
PB10
PB12
PB13
PB14
PB15
VCAP_1
VBAT
VDD
VDD
VDD
VDD
VDDA
VSS
VSS
VSS
VSS
VSSA
STM32F446RET6
nRESET
R5
10K
R6
1K
RST1
C12
4.7uF
GPS_RX
R7
10K
BUTTON
IMU_INT_3V3
IMU_FSYNC_3V3
USB_RESET
CAN2_TX
CAN2_RX
C13
4.7uF
6.3V
TX1
RX1
UART_TX
UART_RX
GPS_TX
IMU_CS_3V3
IMU_SCLK_3V3
IMU_SDO_3V3
IMU_SDI_3V3
CAN1_TX
CAN1_RX
SWD_IO
SWD_CLK
Debug/Programming
J1
SWD_IO
SWD_CLK
nRESET
HEADER 4X2
Test Button
R8
10K
S1
SW_TACTILE
MOUNTING_HOLES
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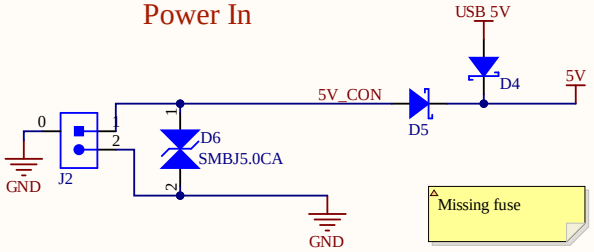
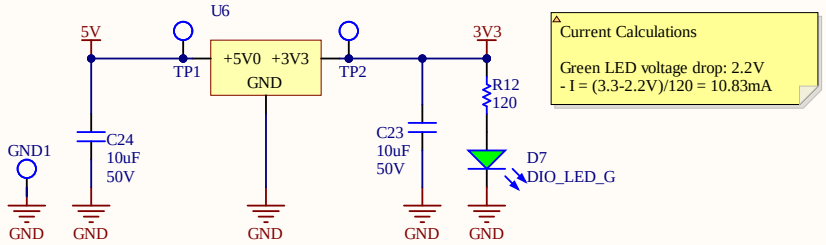
L3, 12a Rodborough Rd
Frenchs Forest
NSW
Australia 2086
UW ROBOTICS TEAM

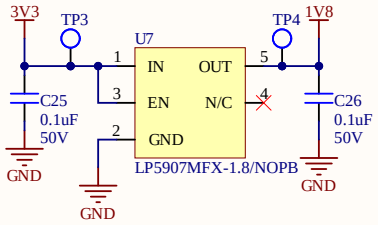
Power In



5V to 3.3V LDO



3.3V to 1.8V LDO



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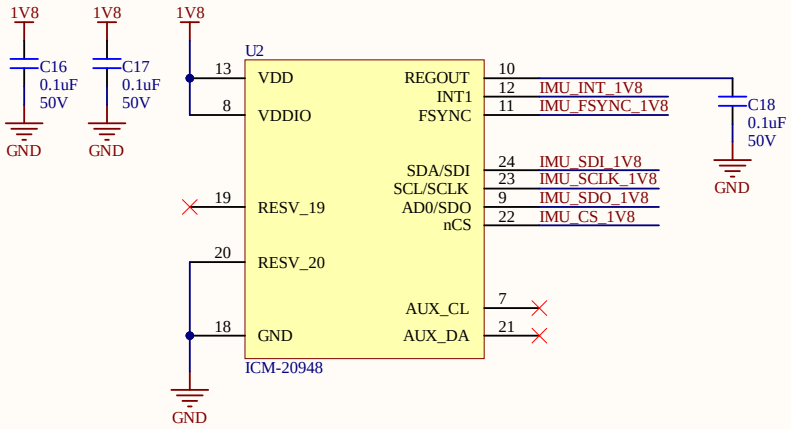
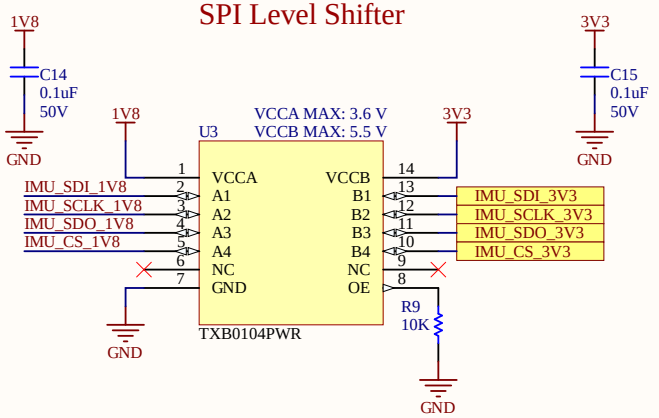
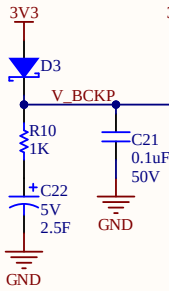
IMU Module



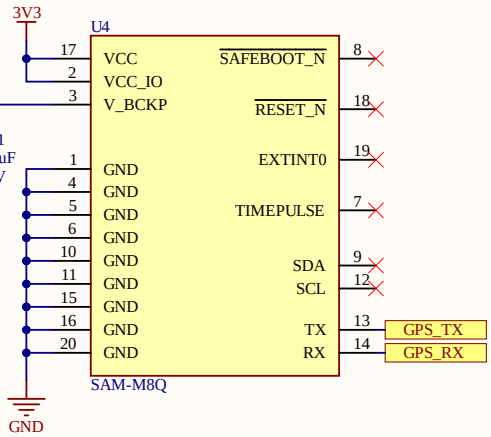
SPI Level Shifter



RTC Backup Power



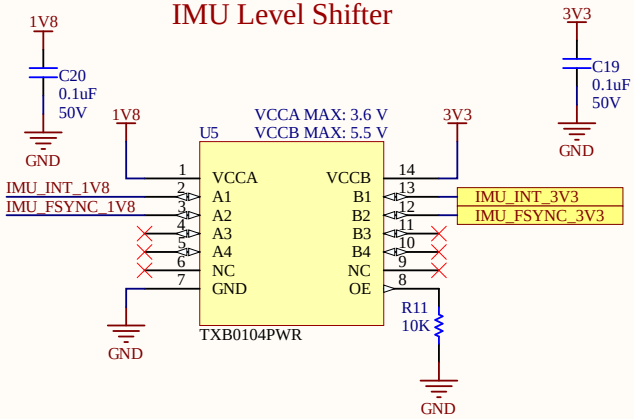
GPS Module



Supercapacitor Calculations

Vcc = 3.3V, Vf = 0.22V, Vmin = 1.4V, I_bkp = 15uA, C = 2.5F
t_bkp = (2.5F) * (3.3V - 0.22V - 1.4V) / (15uA) = 280,000s = 3.241 days
Capacitor tolerance: -0%, +100%, so 3.241 days is minimum

IMU Level Shifter



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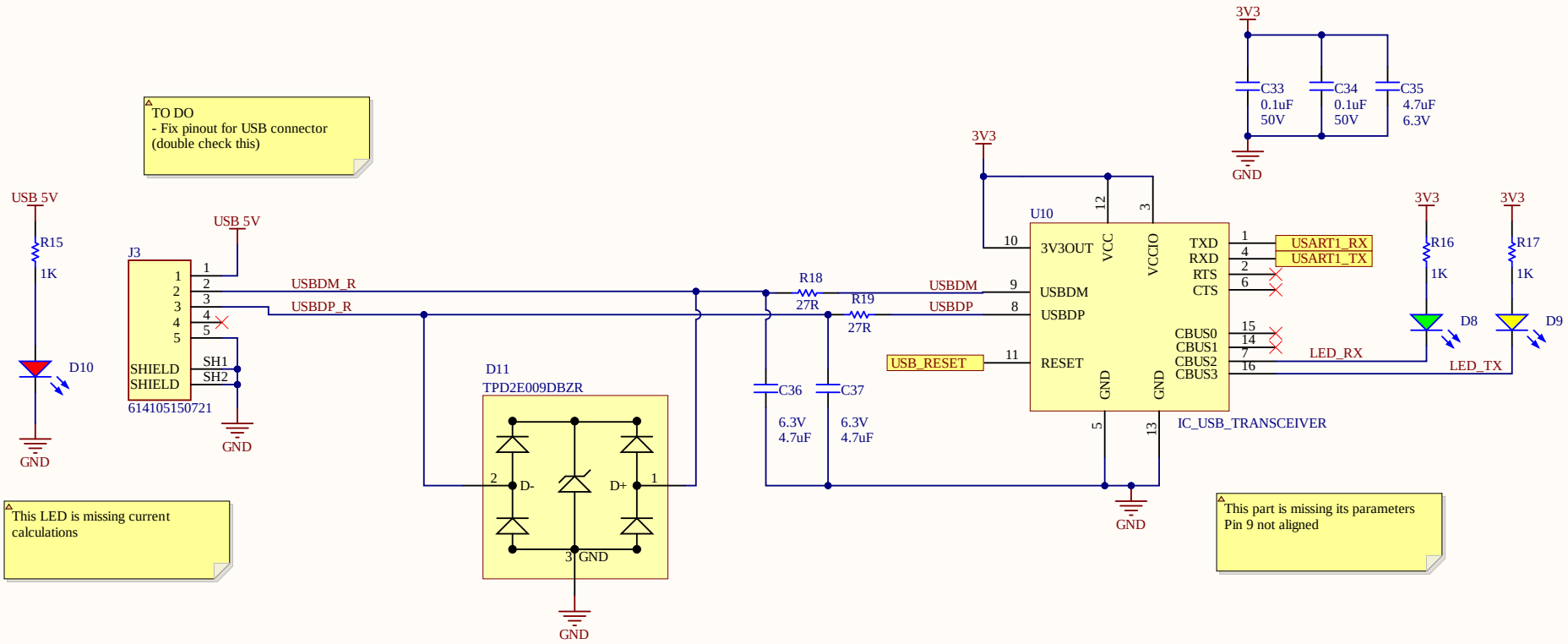

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