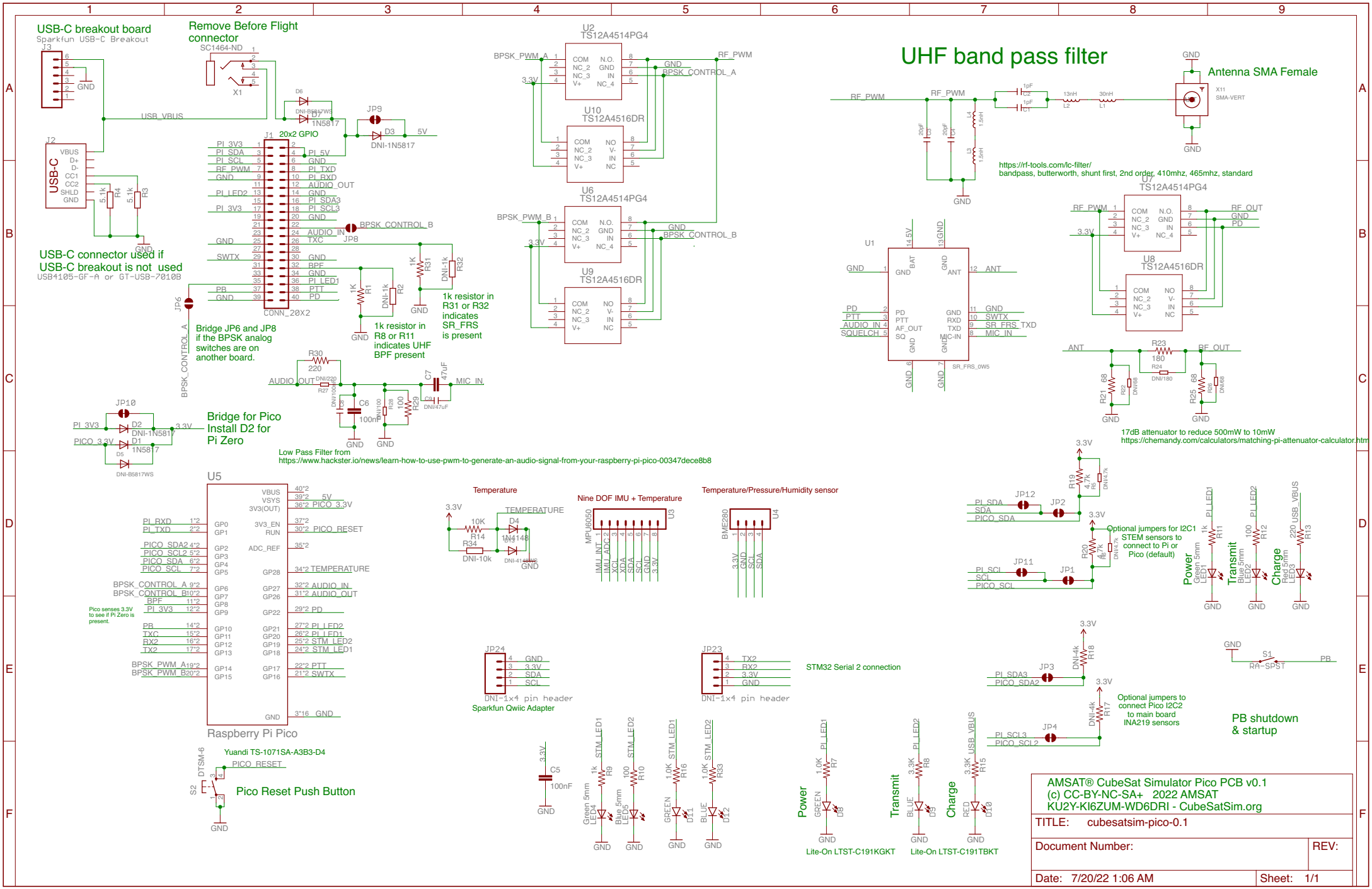
USB-C breakout board
Sparkfun USB-C Breakout
J3
GND
USB_VBUS
Remove Before Flight connector
SC1464-ND
X1
D6
DNI-B5817WS
D7
1N5817
JP9
D3
DNI-1N5817
5V
J2
USB-C
VBUS
D+
D-
CC1
CC2
SHLD
GND
5.1k
R4
5.1k
R3
USB-C connector used if USB-C breakout is not used
USB4105-GF-A or GT-USB-7010B
J1
20x2 GPIO
PI_3V3
PI_SDA
PI_SCL
RF_PWM
GND
PI_LED2
PI_3V3
GND
SWTX
PB
GND
PI_5V
PI_TXD
PI_RXD
AUDIO_OUT
PI_SDA3
PI_SCL3
AUDIO_IN
TXC
BPF
PI_LED1
PTT
PD
CONN_20X2
BPSK_CONTROL_B
JP8
JP6
BPSK_CONTROL_A
Bridge JP6 and JP8 if the BPSK analog switches are on another board.
1K
R1
DNI-1k
R2
1K
R31
DNI-1k
R32
1k resistor in R31 or R32 indicates SR_FRS is present
1k resistor in R8 or R11 indicates UHF BPF present
R30
220
AUDIO_OUT
DNI/220
R27
DNI/100
R28
C6
100nF
DNI/100
R28
100
R29
C7
47uF
C8
DNI/47uF
MIC_IN
JP10
PI_3V3
D2
DNI-1N5817
3.3V
PICO_3.3V
D1
1N5817
D5
DNI-B5817WS
Bridge for Pico Install D2 for Pi Zero
Low Pass Filter from
https://www.hackster.io/news/learn-how-to-use-pwm-to-generate-an-audio-signal-from-your-raspberry-pi-pico-00347dece8b8
U2
TS12A4514PG4
BPSK_PWM_A
3.3V
COM
NC_2
NC_3
V+
N.O.
GND
IN
NC_4
RF_PWM
GND
BPSK_CONTROL_A
U10
TS12A4516DR
COM
NC_2
NC_3
V+
NO
V-
IN
NC
U6
TS12A4514PG4
BPSK_PWM_B
3.3V
GND
BPSK_CONTROL_B
U9
TS12A4516DR
UHF band pass filter
RF_PWM
RF_PWM
1pF
C2
1pF
C1
13nH
L2
30nH
L1
20pF
C3
20pF
C4
L4
1.5nH
L3
1.5nH
GND
X11
SMA-VERT
Antenna SMA Female
https://rf-tools.com/lc-filter/
bandpass, butterworth, shunt first, 2nd order, 410mhz, 465mhz, standard
U7
TS12A4514PG4
RF_PWM
3.3V
RF_OUT
GND
PD
U8
TS12A4516DR
U1
14 5V
13 GND
GND
BAT
GND
ANT
12 ANT
PD
PTT
AUDIO_IN
SQUELCH
PD
PTT
AF_OUT
SQ
GND
GND
RXD
TXD
MIC-IN
GND
11 GND
10 SWTX
9 SR_FRS TXD
8 MIC_IN
GND 6
GND 7
SR_FRS_0W5
ANT
R23
180
R24
DNI/180
RF_OUT
R21
68
R22
DNI/68
R25
68
R26
DNI/68
17dB attenuator to reduce 500mW to 10mW
https://chemandy.com/calculators/matching-pi-attenuator-calculator.htm
U5
VBUS
VSYS
3V3(OUT)
3V3_EN
RUN
ADC_REF
GP0
GP1
GP2
GP3
GP4
GP5
GP28
GP27
GP26
GP22
GP21
GP20
GP19
GP18
GP17
GP16
GP6
GP7
GP8
GP9
GP10
GP11
GP12
GP13
GP14
GP15
GND
40*2
39*2 5V
36*2 PICO_3.3V
37*2
30*2 PICO_RESET
35*2
34*2 TEMPERATURE
32*2 AUDIO_IN
31*2 AUDIO_OUT
29*2 PD
27*2 PI_LED2
26*2 PI_LED1
25*2 STM_LED2
24*2 STM_LED1
22*2 PTT
21*2 SWTX
3*16 GND
PI_RXD 1*2
PI_TXD 2*2
PICO_SDA2 4*2
PICO_SCL2 5*2
PICO_SDA 6*2
PICO_SCL 7*2
BPSK_CONTROL_A 9*2
BPSK_CONTROL_B 10*2
BPF 11*2
PI_3V3 12*2
PB 14*2
TXC 15*2
RX2 16*2
TX2 17*2
BPSK_PWM_A 19*2
BPSK_PWM_B 20*2
Pico senses 3.3V to see if Pi Zero is present.
Raspberry Pi Pico
Temperature
3.3V
10K
R14
R34
DNI-10k
TEMPERATURE
D4
1N4148
D3
DNI-4148WS
GND
Nine DOF IMU + Temperature
MPU6050
U3
IMU_INT
IMU_ADC
XCL
XDA
SDA
SCL
GND
3.3V
Temperature/Pressure/Humidity sensor
BME280
U4
3.3V
GND
SCL
SDA
JP24
GND
3.3V
SDA
SCL
DNI-1x4 pin header
Sparkfun Qwiic Adapter
JP23
TX2
RX2
3.3V
GND
DNI-1x4 pin header
STM32 Serial 2 connection
3.3V
R19
4.7K
R29
DNI/4.7K
JP12
JP2
PI_SDA
SDA
PICO_SDA
3.3V
R20
4.7K
R30
DNI/4.7K
Optional jumpers for I2C1 STEM sensors to connect to Pi or Pico (default)
JP11
JP1
PI_SCL
SCL
PICO_SCL
PI_LED1
1k
R11
Power
Green 5mm
LED1
PI_LED2
100
R12
Transmit
Blue 5mm
LED2
USB_VBUS
220
R13
Charge
Red 5mm
LED3
GND
3.3V
DNI-4k
R18
JP3
PI_SDA3
PICO_SDA2
3.3V
DNI-4k
R17
Optional jumpers to connect Pico I2C2 to main board INA219 sensors
JP4
PI_SCL3
PICO_SCL2
GND
S1
RA-SPST
PB
PB shutdown & startup
DTSM-6
Yuandi TS-1071SA-A3B3-D4
PICO_RESET
S2
Pico Reset Push Button
GND
3.3V
C5
100nF
GND
STM_LED1
1k
R9
Green 5mm
LED4
STM_LED2
100
R10
Blue 5mm
LED5
STM_LED1
1.0K
R16
GREEN
D11
STM_LED2
1.0K
R33
BLUE
D12
PI_LED1
1.0K
R7
Power
GREEN
D8
Lite-On LTST-C191KGKT
PI_LED2
3.3K
R8
Transmit
BLUE
D9
Lite-On LTST-C191TBKT
USB_VBUS
3.3K
R15
Charge
RED
D10
AMSAT® CubeSat Simulator Pico PCB v0.1
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