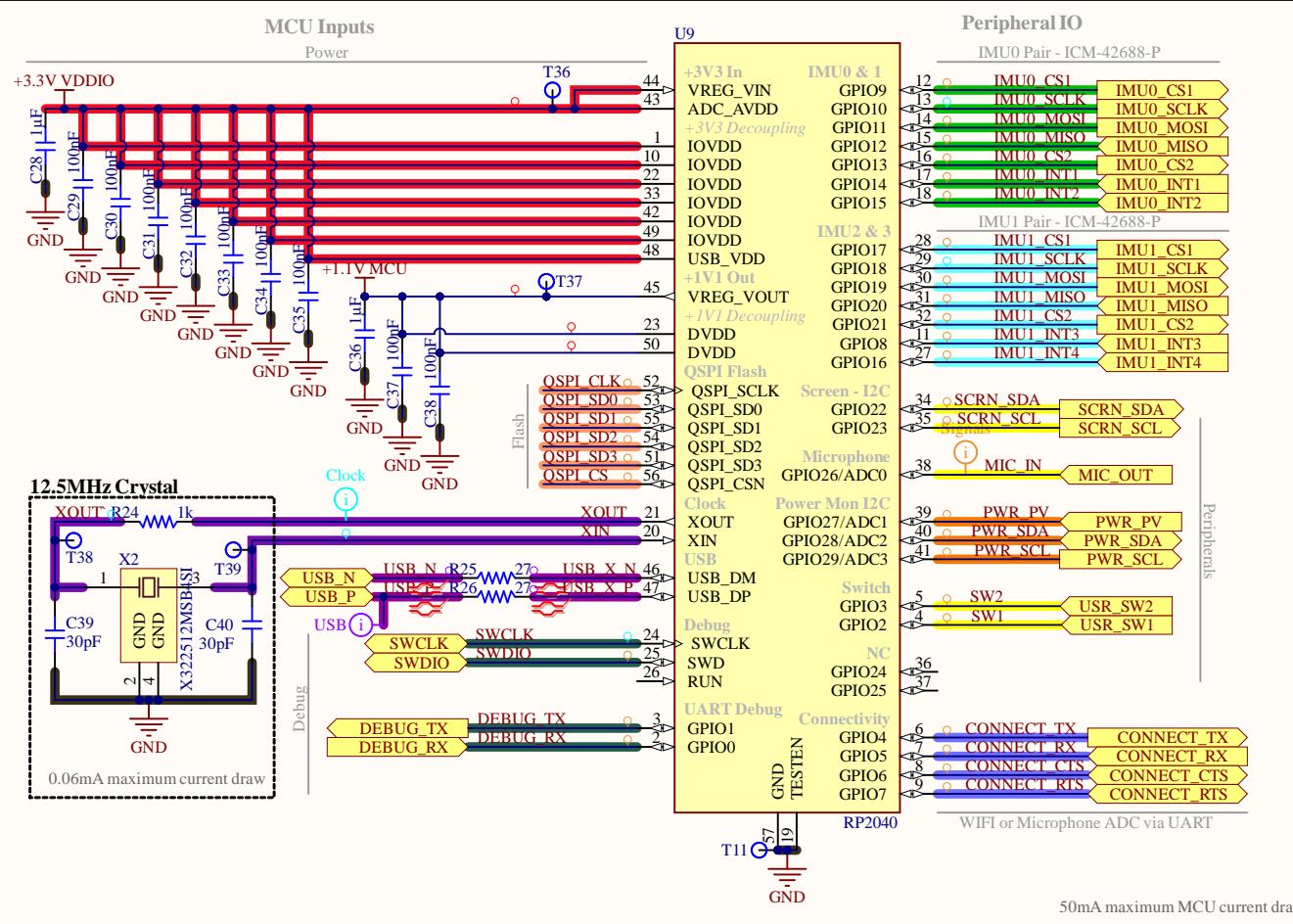
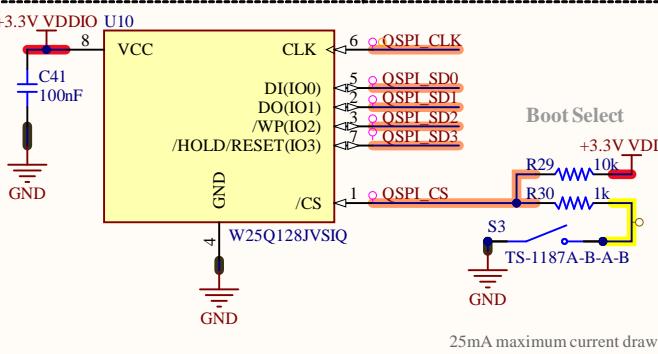


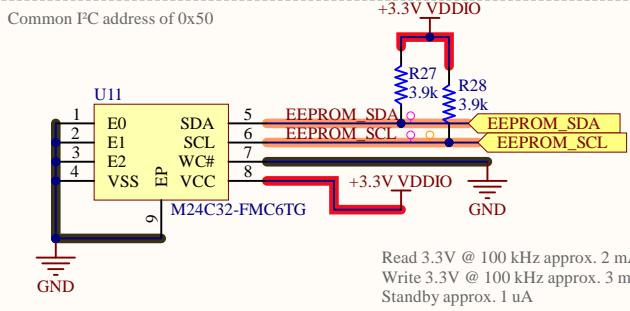
MCU & Crystal - Intermediary



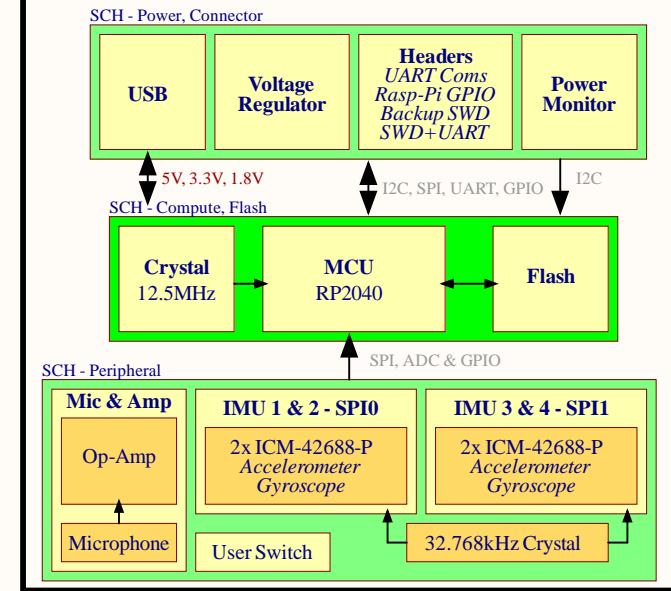
Flash - RP2040



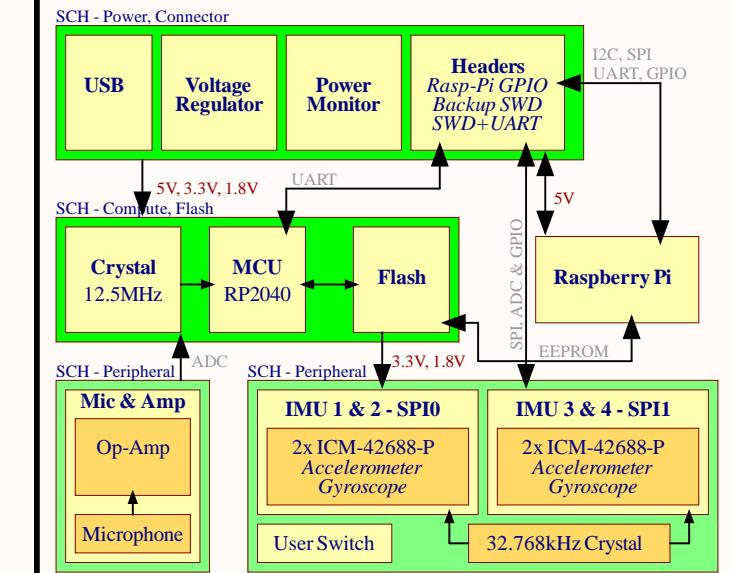
Flash - EEPROM - Raspberry Pi



Block Diagram - Standalone Mode - RP2040 Only



Block Diagram - HAT Mode - Raspberry Pi

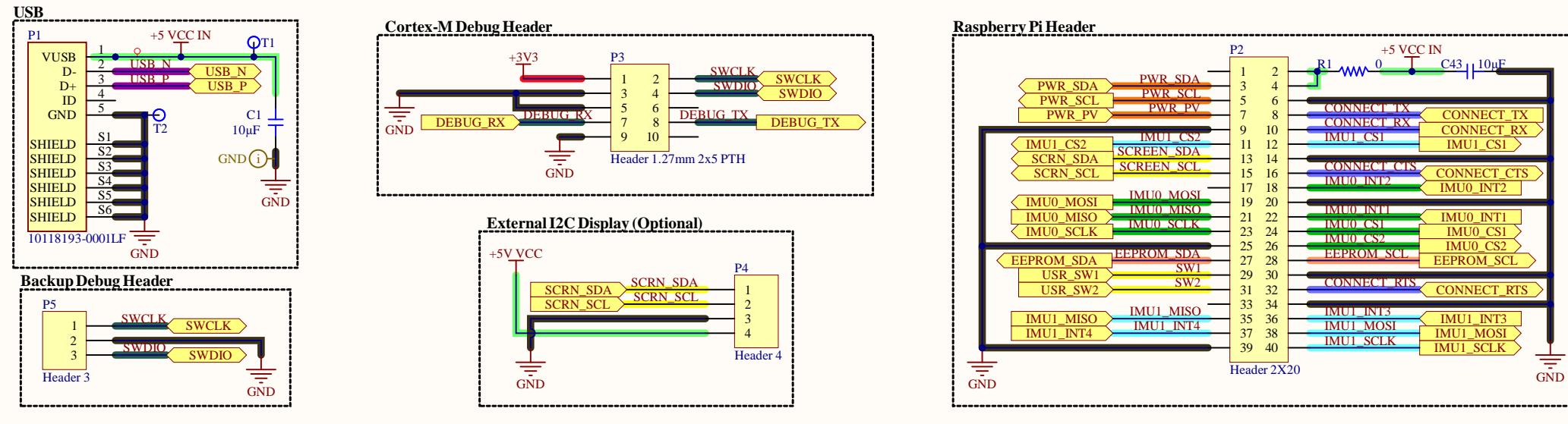


Assignment 2 - qfuse Compute & Flash

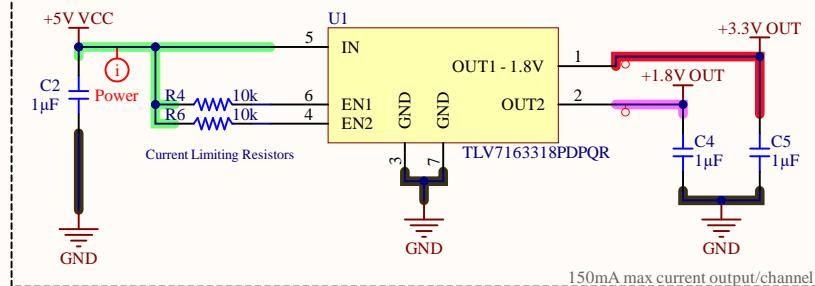
Sheet 1 of 4
Date: 25/09/2024 Time: 10:39:42 AM
File: SCH - Compute, Flash.SchDoc

Drawn by:
Liam McLaren
Jacob Finger

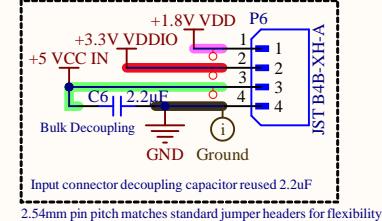
Input & Output - Headers and USB



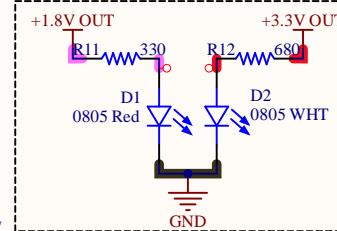
LDO Regulator - 1.8V & 3.3V



JST - Auxilliary Power In



Status LEDs

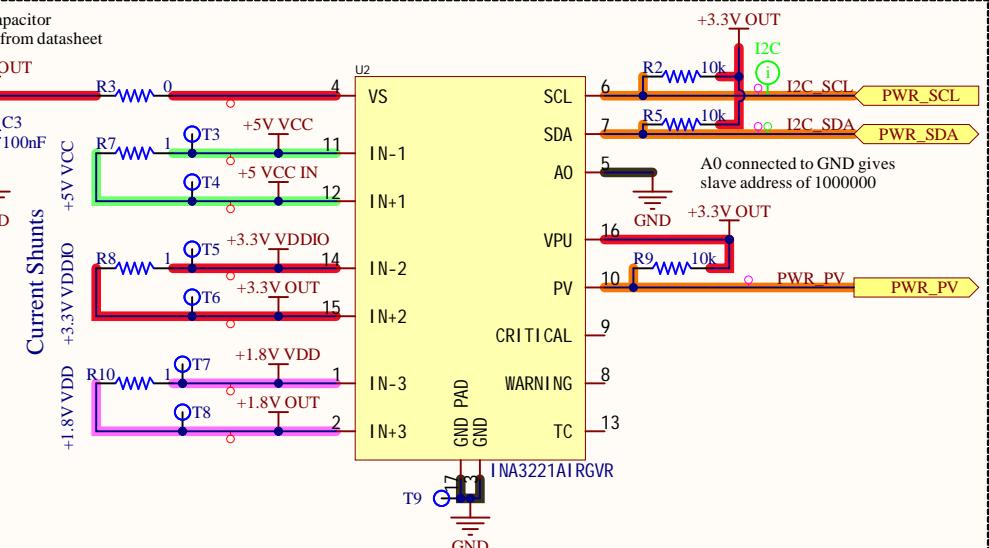


System Current Draw

IMU - 88µA * 4 = 352µA
 Flash - 25mA
 MCU - 50mA
 32kHz Crystal - 3mA
 12.5MHz Crystal - 0.06mA
 Op-Amp - 250µA
 Microphone - 250µA
 Power Monitor - 350µA
 Switch - 33µA * 2
 Status LED's
 $= 5\text{mA} + 5.45\text{mA} = 10.45\text{mA}$

Power Monitoring

Bypass capacitor
specified from datasheet



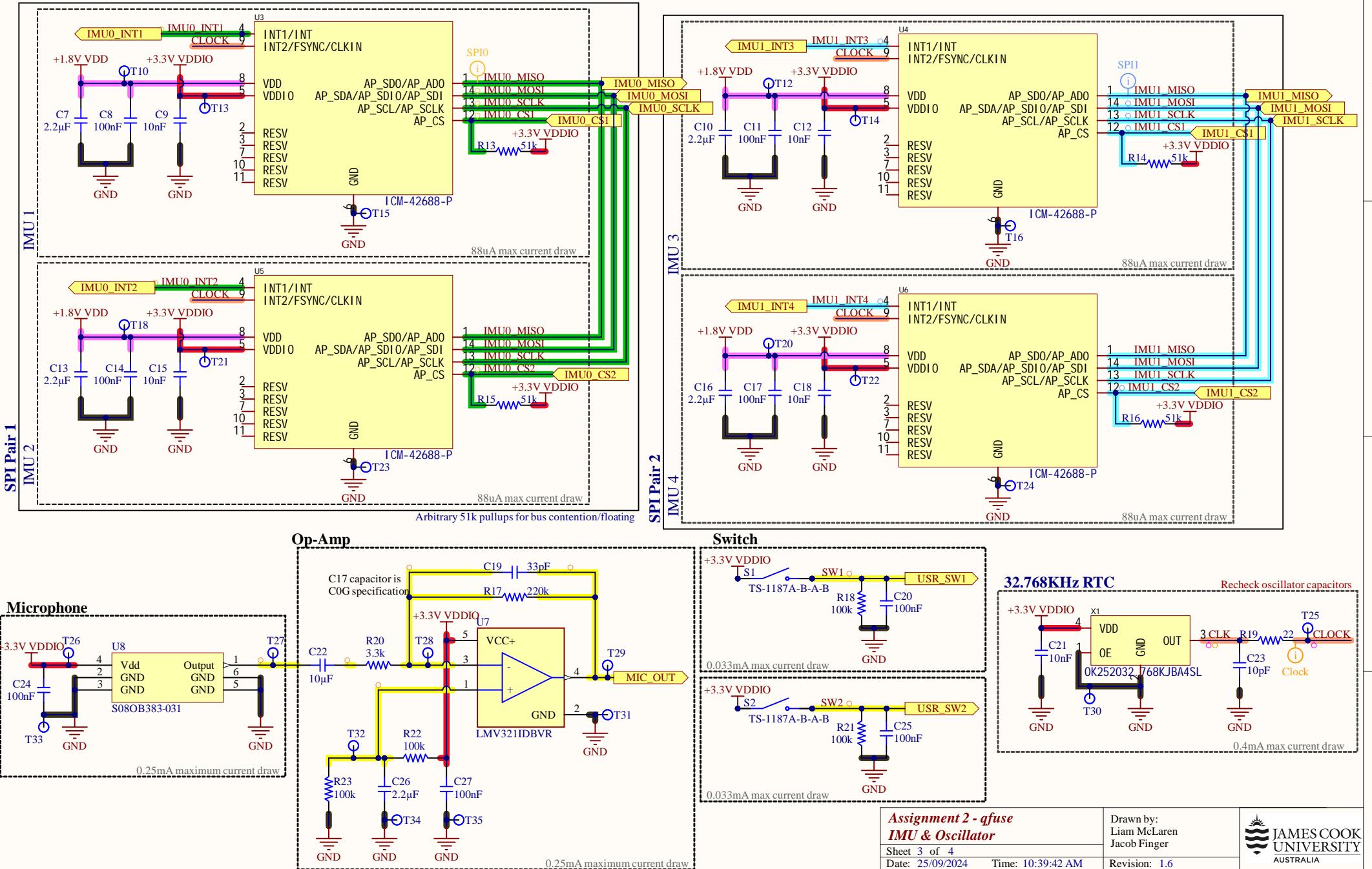
Fiducials



Assignment 2 - qfuse Power & Connection

Sheet 2 of 4 Date: Time: 10:39:42 AM File: SCH_Power_Connector.SchDoc

Drawn by:
Liam McLaren
Jacob Finger



A

A

B

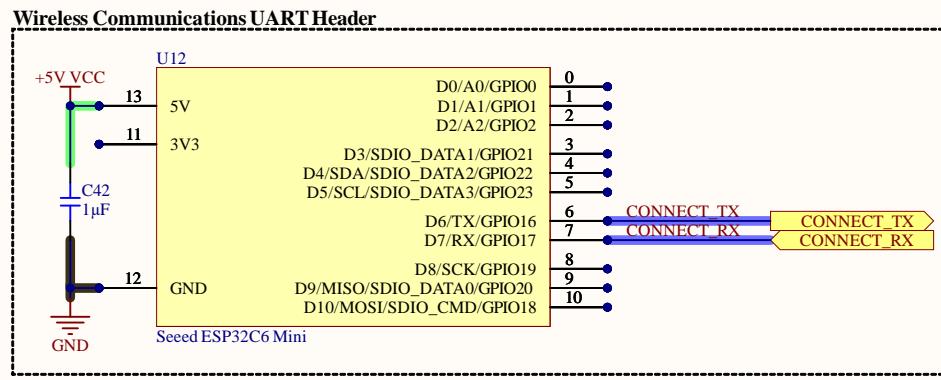
B

C

C

D

D



**Assignment 2 - qfuse
Wireless Coms**

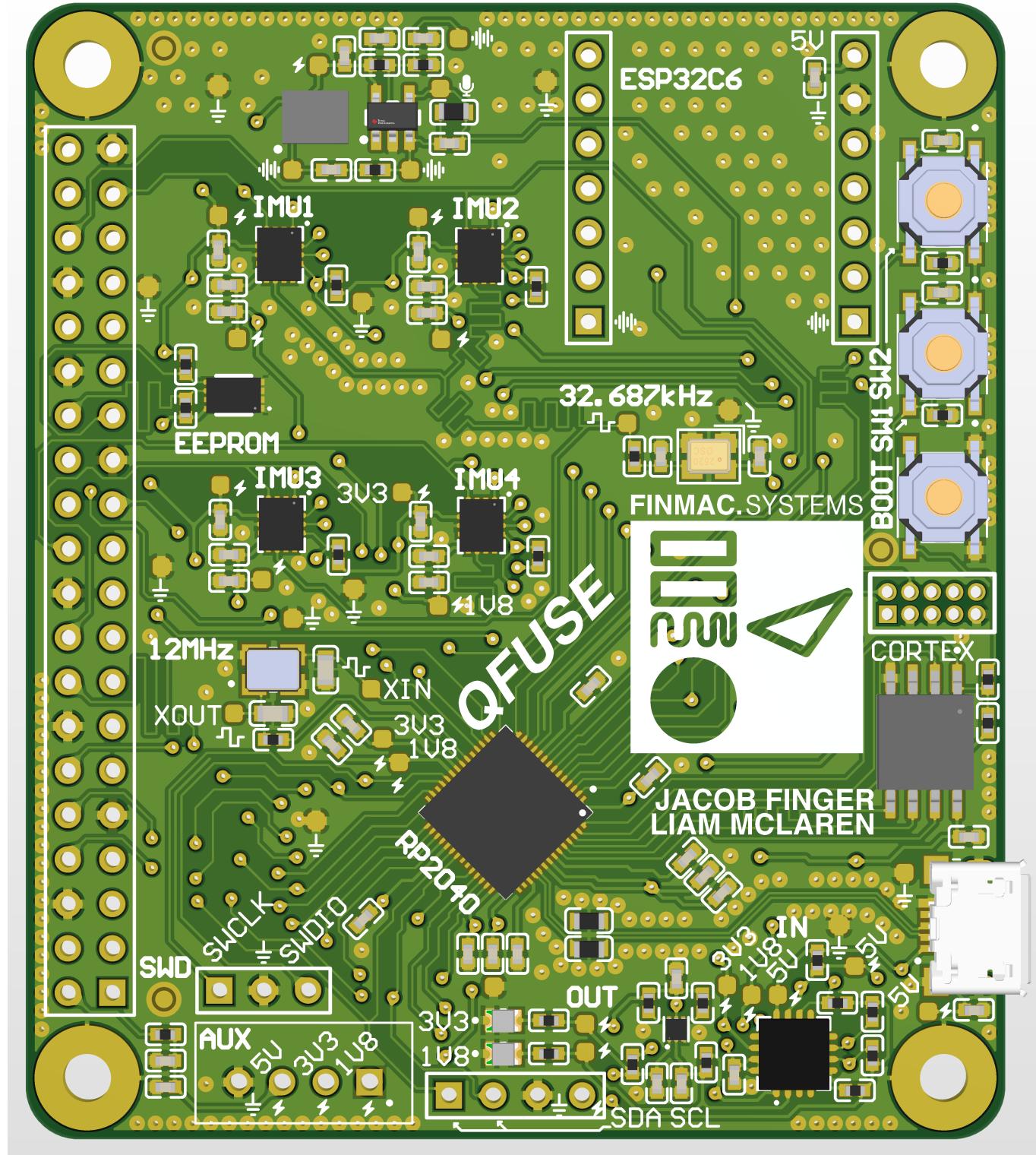
Sheet 4 of 4

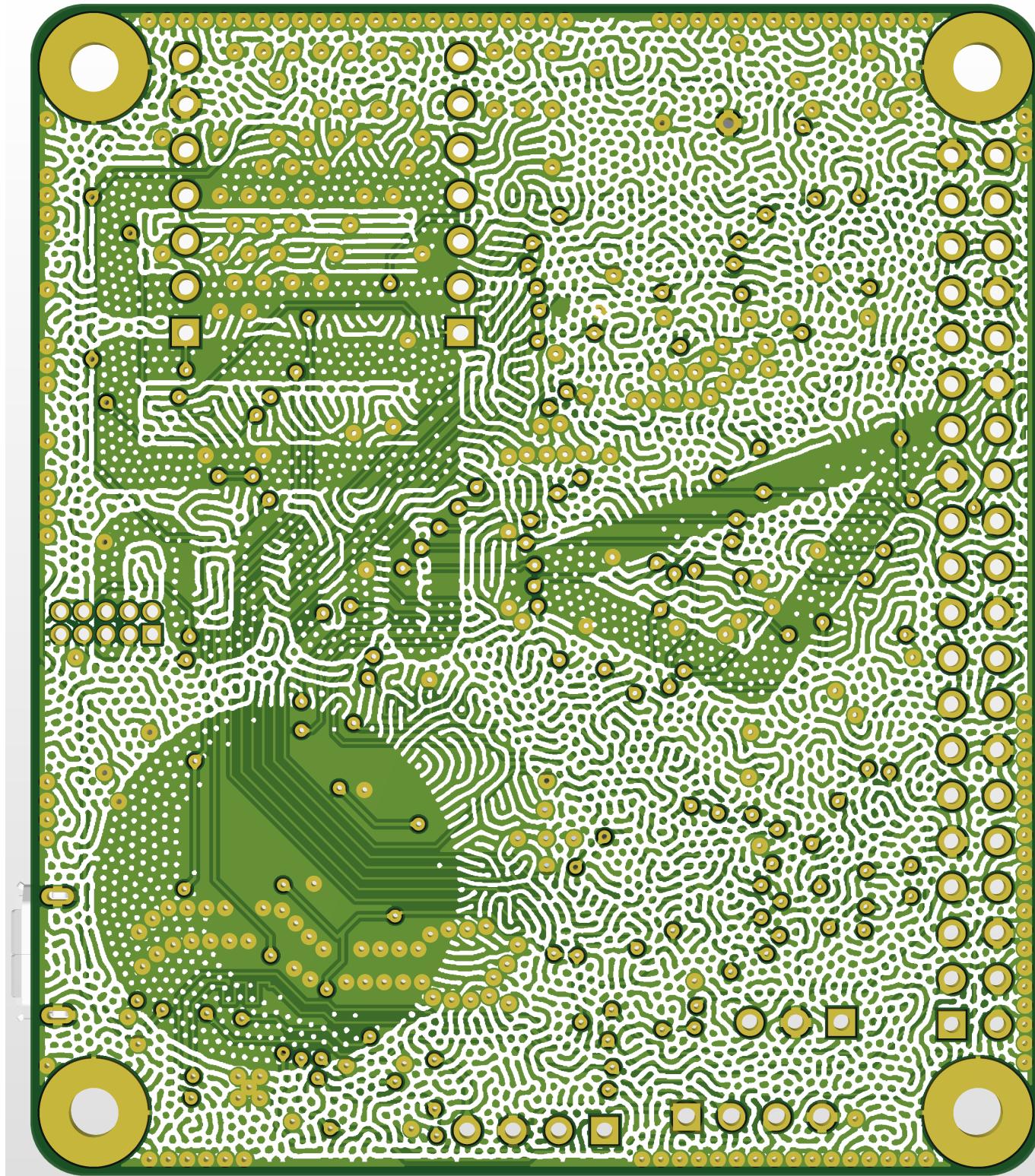
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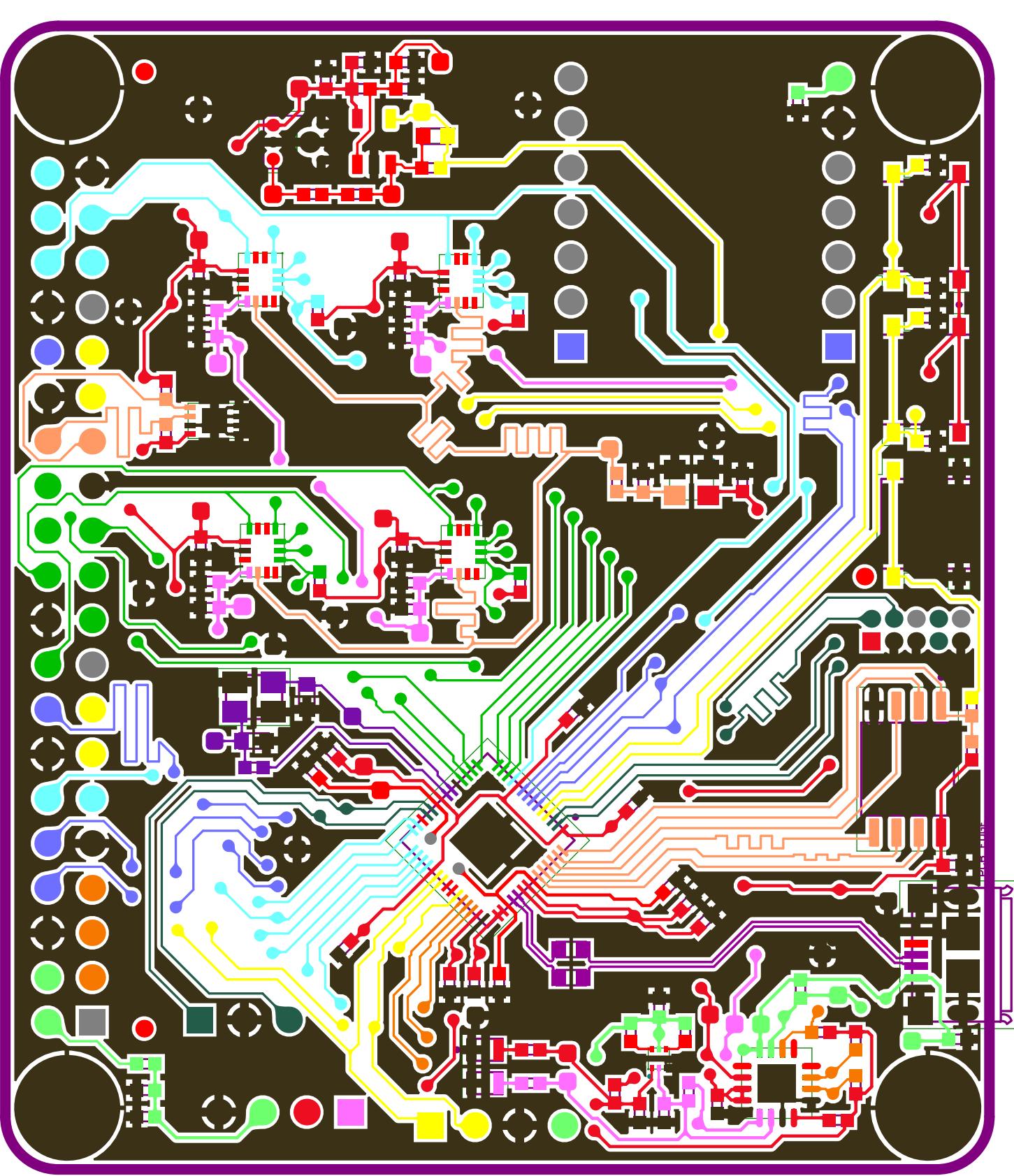
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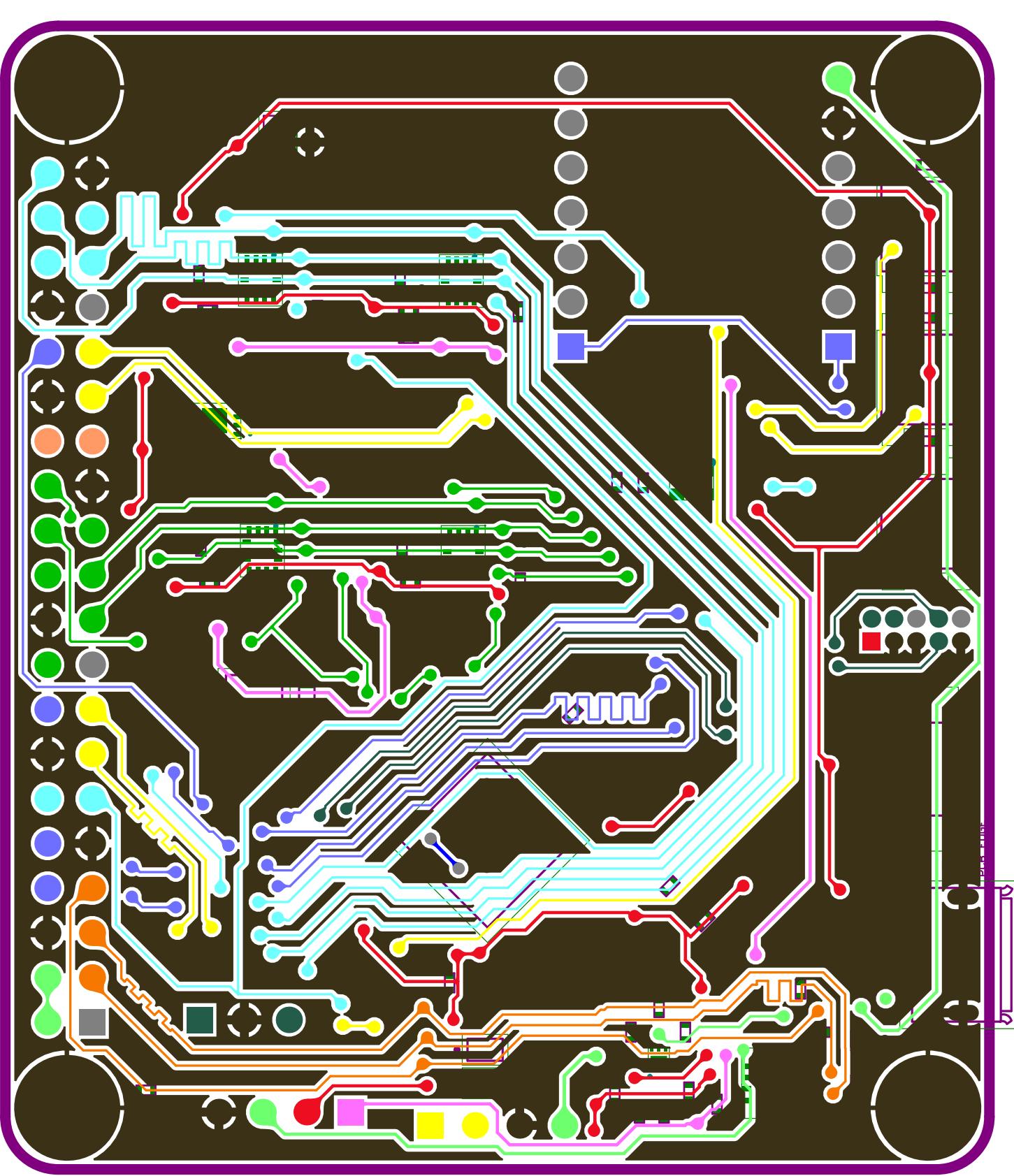
Drawn by:
Jacob Finger
Liam McLaren

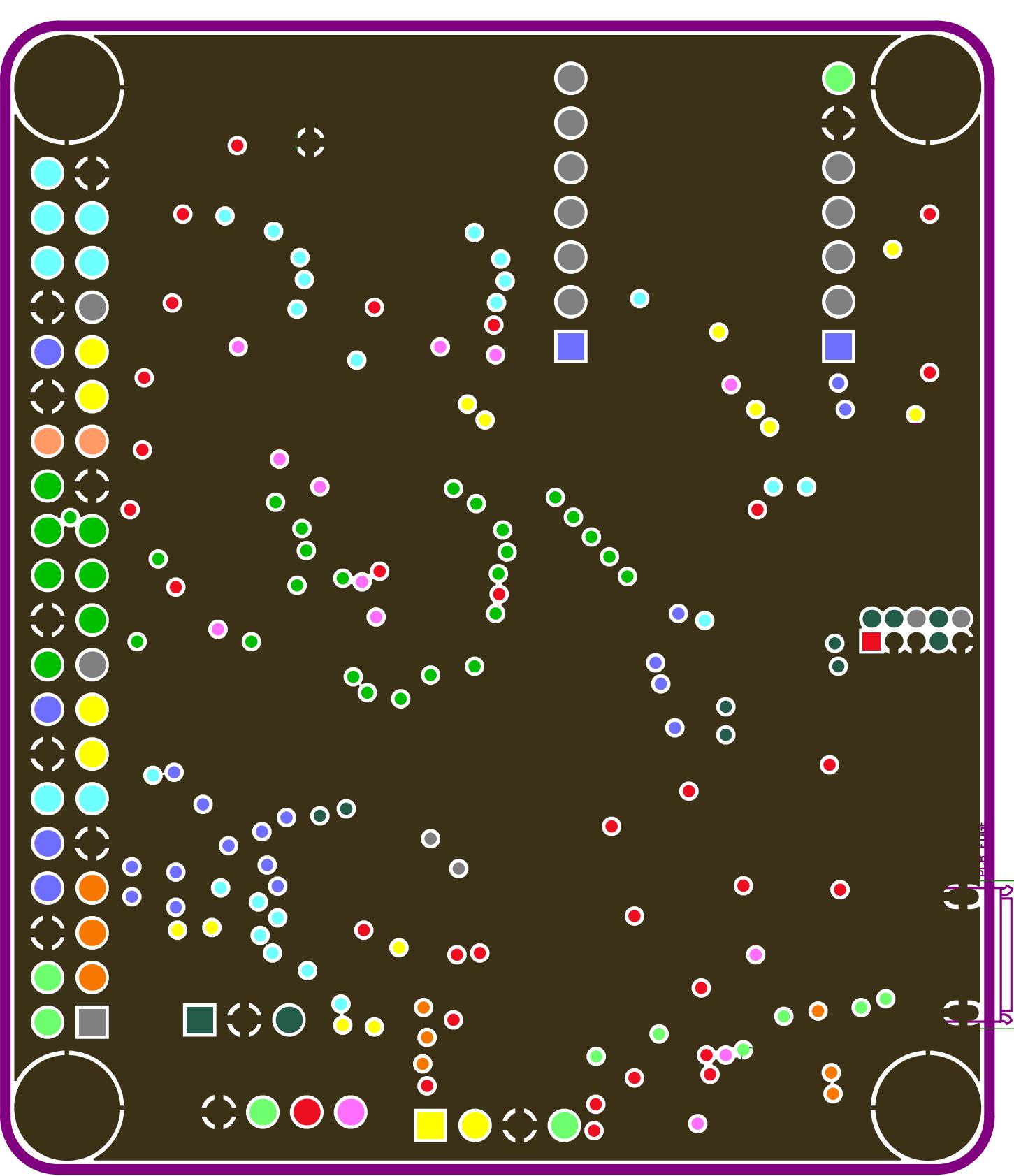


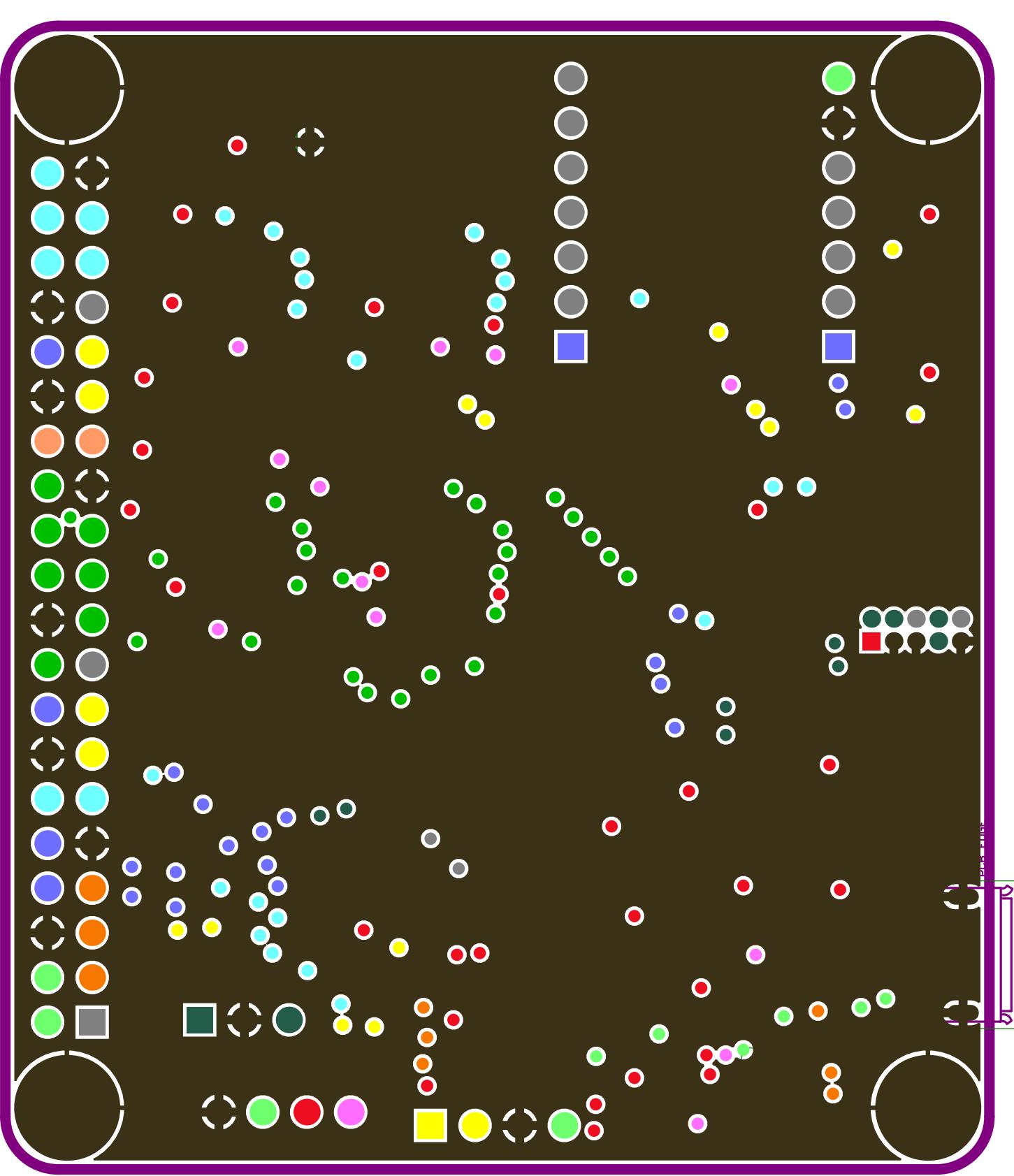












Description	Designator	Footprint	JLCPOB Part Number
Capacitor, Ceramic (MLCC), 10uF, ±20%, 6.3V, X5R, ±20%, SMD 0402	C1, C22, C43	CAP-0402	C15525
Capacitor, Ceramic (MLCC), 1uF, ±10%, 25V, X5R, ±10%, SMD 0402	C2, C4, C5, C28, C36, C42	CAP-0402	C52923
Capacitor, Ceramic (MLCC), 100nF, ±10%, 50V, X7R, ±10%, SMD 0402	C3, C8, C11, C14, C17, C24, C27, C29, C30, C31, C32, C33, C34, C35, C37, C38, C41	CAP-0402	C307331
Capacitor, Ceramic (MLCC), 2.2uF, ±20%, 6.3V, X5R, ±20%, SMD 0402	C6, C7, C10, C13, C16, C26	CAP-0402	C12530
Capacitor, Ceramic (MLCC), 10nF, ±10%, 50V, X7R, ±10%, SMD 0402	C9, C12, C15, C18, C21	CAP-0402	C15195
Capacitor, Ceramic (MLCC), 33pF, ±5% 50V, C0G, ±5%, SMD 0402	C19	CAP-0402	C1562
Capacitor, Ceramic (MLCC), 100nF, ±10%, 16V, X7R, ±10%, SMD 0402	C20, C25	CAP-0402	C1525
Capacitor, Ceramic (MLCC), 10pF, ±5% 50V, C0G, ±5%, SMD 0402	C23	CAP-0402	C32949
Capacitor, Ceramic (MLCC), 30pF, ±5% 50V, C0G, ±5%, SMD 0603	C39, C40	CAP-0603	C1658
0805 Red LED 25mA Vf = 1.6-2.6V - 20mA 67mcd~195mcd -30°C~+85°C 615nm~630nm Red 130° 65mW 1.6V~2.6V 0805 Light Emitting Diodes (LED) ROHS	D1	NCD0805R1	C84256
0805 WHT LED 25mA Vf = 2.6-3.2V - 0805 Light Emitting Diodes (LED) ROHS	D2	LED_KT-0805G	C34499
USB - micro B USB 2.0 Receptacle Connector 5 Position Surface Mount, Right Angle; Through Hole	P1	FQ_10118193-0001LF	C132562
Resistor, 0Ω, ±1%, 62.5mW, 50V, ±800ppm/°C, -55°C~+155°C, SMD 0402	R1, R3	RES-0402	C17168
Resistor, 10kΩ, ±1%, 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R2, R4, R5, R6, R9, R29	RES-0402	C25744
Resistor, 1Ω, ±1% 62.5mW, 50V, ±200ppm/°C, -55°C~+155°C, SMD 0402	R7, R8, R10	RES-0402	C25086
Resistor, 330Ω, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R11	RES-0402	C25104
Resistor, 680Ω, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R12	RES-0402	C25130
Resistor, 51kΩ, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R13, R14, R15, R16	RES-0402	C25794
Resistor, 220kΩ, ±1% 100mW, 75V, ±100ppm/°C, -55°C~+155°C, SMD 0603	R17	RES-0603	C22961
Resistor, 100kΩ, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R18, R21, R22, R23	RES-0402	C25741
Resistor, 22Ω, ±1% 62.5mW, 50V, ±200ppm/°C, -55°C~+155°C, SMD 0402	R19	RES-0402	C25092
Resistor, 3.3kΩ, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R20	RES-0402	C25890
Resistor, 1kΩ, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R24, R30	RES-0402	C11702
Resistor, 27Ω, ±1% 100mW, 75V, ±200ppm/°C, -55°C~+155°C, SMD 0603	R25, R26	RES-0603	C25190
Resistor, 3.9kΩ, ±1% 62.5mW, 50V, ±100ppm/°C, -55°C~+155°C, SMD 0402	R27, R28	RES-0402	C51721
SPST 50mA @ 12VDC Top Actuated Round Button 160gf SMD Tactile Switches ROHS	S1, S2, S3	SW_TS_1187A-B-A-B	C318884
Texas Instruments - TLV7163318PDPQR 150mA Fixed Positive electrode 5.5V X2SON-6(1.2x1.2) Voltage Regulators - Linear, Low Drop Out (LDO) Regulators ROHS	U1	XDFN-6_L1.2-W1.2-P0.40-BL-EP	C2859836
Texas Instruments INA3221AIRGV-R QFN-16-EP(4x4) Current Sense Amplifiers ROHS	U2	QFN-16_L4.0-W4.0-P0.65-TL-EP2.2	C181255
ICM-42688-P LGA-14(2.5x3) Attitude Sensor/Gyroscope	U3, U4, U5, U6	LGA-14_L3.0-W2.5-P0.50-TL	C1850418
General Purpose Amplifier 1 Circuit Rail-to-Rail SOT-23-5	U7	FP-DBV0005A-MFG	C7972
MEMS Microphone SMD 3.76x3x1.1mm	U8	Goertek_S08OB381-026	C233789
ARM Cortex-M0+ MCU 32-Bit Microcontroller for Raspberry Pi Pico	U9	QFN40P700X700X90-57N	C2040
FLASH - NOR Memory IC 128Mb (16Mx8) SPI - Quad I/O, QPI, DTR 133MHz-8-SOIC	U10	SOIC127P790X216-8N	C97521
STMicroelectronics M24C32-FM06TG - UFDFPN-8(2x3) - 32Kbit I2C UFDFPN-8(2x3) EEPROM ROHS	U11	M24C32-FM06TG	C2060985
YXC Crystal Oscillators - OK252032.768KBA4SL - SMD2520-4P - 1.8V-3.3V±10ppm 5mA ±20ppm CMOS 32.768kHz SMD2520-4P Crystal Oscillators ROHS	X1	OSC_SMD_4P-L2.5-W2.0-BL	C669098
12MHz SMD Crystal Resonator 20pF±10ppm ±30ppm -40°C~+85°C SMD3225-4P Crystals ROHS Yangxing Tech	X2	X322512MSB4S-Footprint-1	C9002