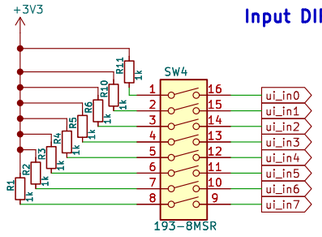
Tiny Tapeout 06+ Demo Board

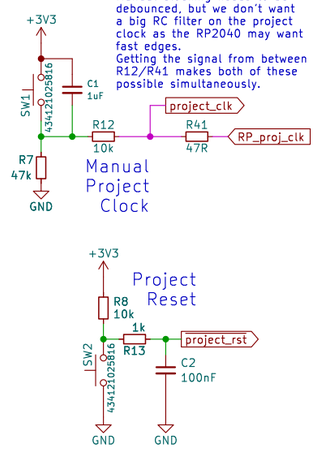
User Input + Config

Input DIP

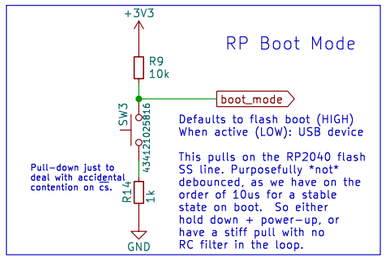


Alt: 76SB08ST

Momentary Switches (debounced)

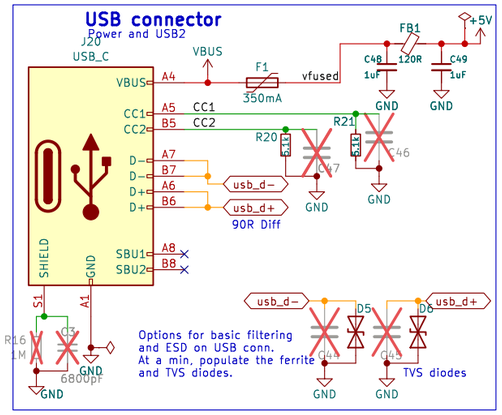


RP Boot Mode

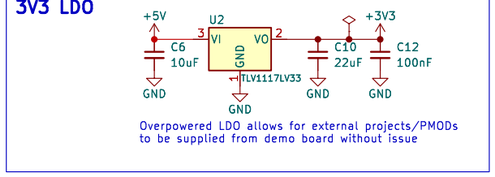


Power

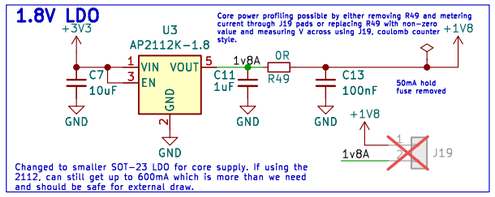
USB connector



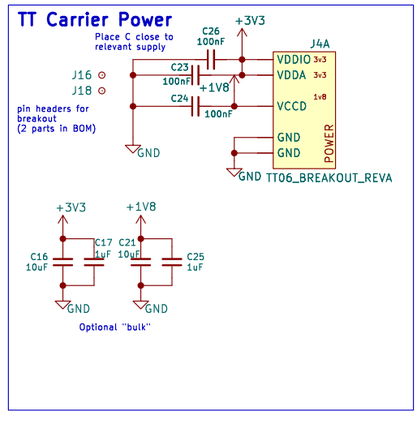
3V3 LDO



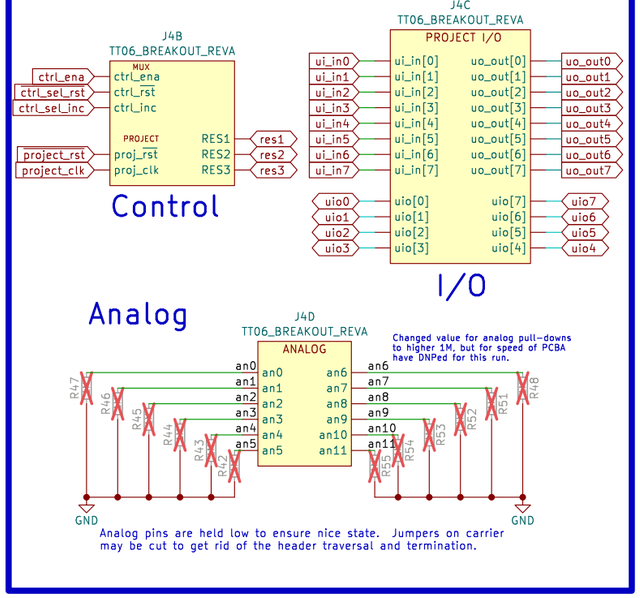
1.8V LDO



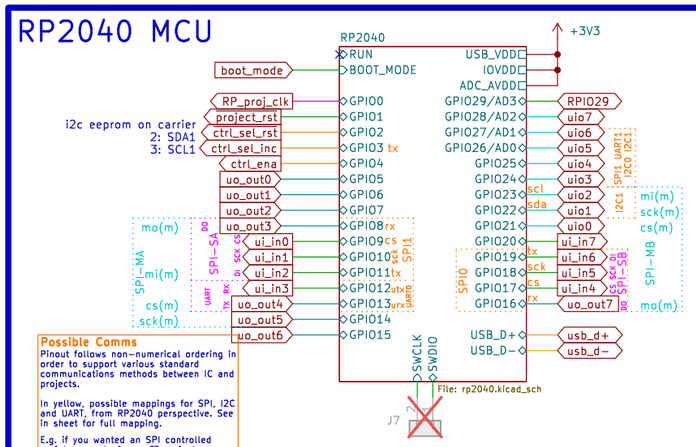
TT Carrier Power

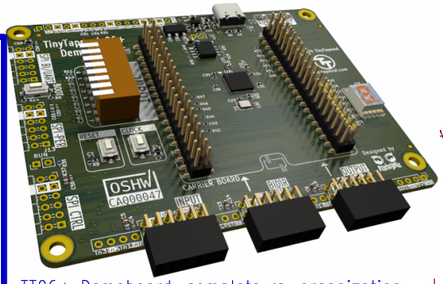


TT Carrier Logic



RP2040 MCU

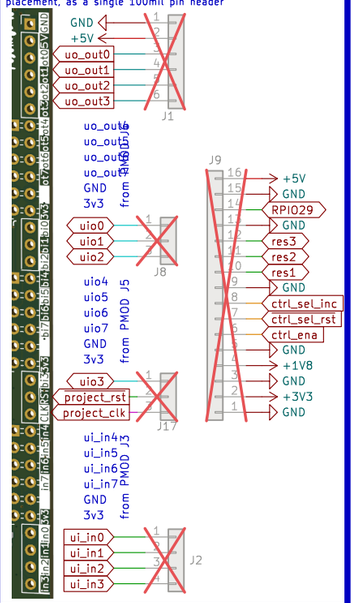




TT06+ Demoboard: complete re-organization, support for TT06+ new carrier pinout.
For users, main difference is the new piano DIP input and the fact no MUX is in the way on demoboards.
https://github.com/TinyTapeout/tt-demo-pcb

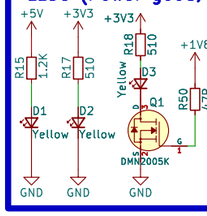
Board edge connectors (pinheaders)

I/O is available through standard PMODs or, with judicious placement, as a single 100mil pin header

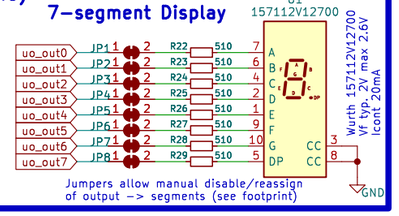


Indication

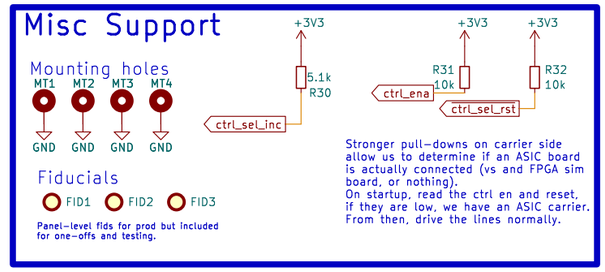
LEDs (Power good, GPIO)



7-segment Display

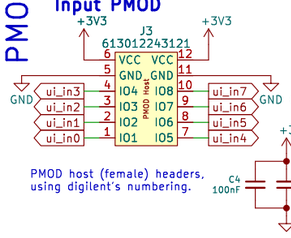


Misc Support

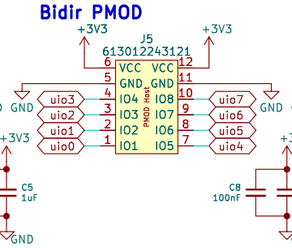


PMOD

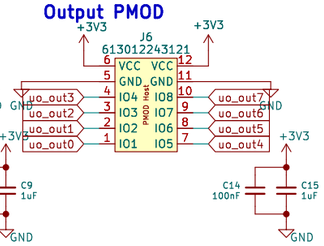
Input PMOD



Bidir PMOD

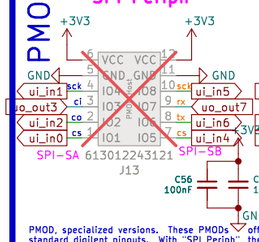


Output PMOD

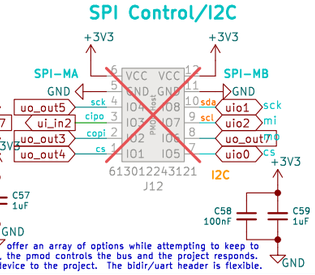


PMOD

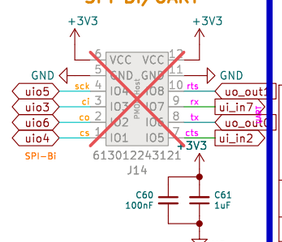
SPI Periph



SPI Control/I2C



SPI Bi/UART



PMOD, specialized versions. These PMODs offer an array of options while attempting to keep to standard digilent pinouts. With "SPI Periph", the pmod controls the bus and the project responds. On "SPI Control", the pmod is a peripheral device to the project. The bidir/uart header is flexible.

(C) 2024 Pat Deegan

Psychogenic Technologies

Sheet: /
File: tinytapeout-demo.kicad_sch

Title: Tiny Tapeout 06+ Demo Board

Size: A3	Date: 2024-12-10	**Rev: 2.1.0**
KiCad E.D.A. 8.0.7		Id: 1/2

RP2040 Basic Support

IOVDD — Logic supply, nominally 3v3.

BOOT_MODE — QSPI_SS: When held low on powerup, flash SS determines boot mode (HIGH == flash boot, LOW == USB device)

USB_VDD supplies USB PHY, nominal 3v3. If IOVDD is 3v3, can share supply.

In fact, in this and many applications, IOVDD, USB_VDD and ADC_AVDD are all powered directly from a single 3v3 supply, with the 1v1 digital core being handle by on-board regulator.

VREG_VOUT: Int core regulator, 1.1V. Can supply DVDD. Place 1uF in/out bypass near pin.

RUN: async reset

J10: Short to hold in reset

Flash program header. Note: should we replace 3v3 with RUN, to be able to reset/hold while updating flash?

WE 830108206909: CFPX-180 model, 10 ppm tol, 20ppm stab, CL 8pF

Rule of thumb: C1, C2 = 2 * CL - 2 * Cstray. Using a stray cap of 5pF, gives Cn = 6pF

Into: CL = (C1 * C2) / (C1 + C2) + Cstray. These Cn = 6p give CL = 8pF -- just what we need.

Factory test mode: GND

U6 RP2040

Flash

Note: SS pulled-up externally, from bootmode switch

U5 W25Q32JVSS

Quad SPI requires QE bit in status register-2 to be set. In this case, WP becomes IO2 and HOLD becomes IO3.

Supply bypass, place near 1, 10, 22, 33, 42, 49

Supply bypass, near 23, 50

	Function								
GPIO	F1	F2	F3	F4	F5	F6	F7	F8	F9
0	SPI0 RX	UART0 TX	I2C0 SDA	PWM0 A	SIO	PIO0	PIO1		USB OVCUR DET
1	SPI0 CSn	UART0 RX	I2C0 SCL	PWM0 B	SIO	PIO0	PIO1		USB VBUS DET
2	SPI0 SCK	UART0 CTS	I2C1 SDA	PWM1 A	SIO	PIO0	PIO1		USB VBUS EN
3	SPI0 TX	UART0 RTS	I2C1 SCL	PWM1 B	SIO	PIO0	PIO1		USB OVCUR DET
4	SPI0 RX	UART1 TX	I2C0 SDA	PWM2 A	SIO	PIO0	PIO1		USB VBUS DET
5	SPI0 CSn	UART1 RX	I2C0 SCL	PWM2 B	SIO	PIO0	PIO1		USB VBUS EN
6	SPI0 SCK	UART1 CTS	I2C1 SDA	PWM3 A	SIO	PIO0	PIO1		USB OVCUR DET
7	SPI0 TX	UART1 RTS	I2C1 SCL	PWM3 B	SIO	PIO0	PIO1		USB VBUS DET
8	SPI1 RX	UART1 TX	I2C0 SDA	PWM4 A	SIO	PIO0	PIO1		USB VBUS EN
9	SPI1 CSn	UART1 RX	I2C0 SCL	PWM4 B	SIO	PIO0	PIO1		USB OVCUR DET
10	SPI1 SCK	UART1 CTS	I2C1 SDA	PWM5 A	SIO	PIO0	PIO1		USB VBUS DET
11	SPI1 TX	UART1 RTS	I2C1 SCL	PWM5 B	SIO	PIO0	PIO1		USB VBUS EN
12	SPI1 RX	UART0 TX	I2C0 SDA	PWM6 A	SIO	PIO0	PIO1		USB OVCUR DET
13	SPI1 CSn	UART0 RX	I2C0 SCL	PWM6 B	SIO	PIO0	PIO1		USB VBUS DET
14	SPI1 SCK	UART0 CTS	I2C1 SDA	PWM7 A	SIO	PIO0	PIO1		USB VBUS EN
15	SPI1 TX	UART0 RTS	I2C1 SCL	PWM7 B	SIO	PIO0	PIO1		USB OVCUR DET
16	SPI0 RX	UART0 TX	I2C0 SDA	PWM0 A	SIO	PIO0	PIO1		USB VBUS DET
17	SPI0 CSn	UART0 RX	I2C0 SCL	PWM0 B	SIO	PIO0	PIO1		USB VBUS EN
18	SPI0 SCK	UART0 CTS	I2C1 SDA	PWM1 A	SIO	PIO0	PIO1		USB OVCUR DET
19	SPI0 TX	UART0 RTS	I2C1 SCL	PWM1 B	SIO	PIO0	PIO1		USB VBUS DET
20	SPI0 RX	UART1 TX	I2C0 SDA	PWM2 A	SIO	PIO0	PIO1	CLOCK GPIN0	USB VBUS EN
21	SPI0 CSn	UART1 RX	I2C0 SCL	PWM2 B	SIO	PIO0	PIO1	CLOCK GPOUT0	USB OVCUR DET
22	SPI0 SCK	UART1 CTS	I2C1 SDA	PWM3 A	SIO	PIO0	PIO1	CLOCK GPIN1	USB VBUS DET
23	SPI0 TX	UART1 RTS	I2C1 SCL	PWM3 B	SIO	PIO0	PIO1	CLOCK GPOUT1	USB VBUS EN
24	SPI1 RX	UART1 TX	I2C0 SDA	PWM4 A	SIO	PIO0	PIO1	CLOCK GPOUT2	USB OVCUR DET
25	SPI1 CSn	UART1 RX	I2C0 SCL	PWM4 B	SIO	PIO0	PIO1	CLOCK GPOUT3	USB VBUS DET
26	SPI1 SCK	UART1 CTS	I2C1 SDA	PWM5 A	SIO	PIO0	PIO1		USB VBUS EN
27	SPI1 TX	UART1 RTS	I2C1 SCL	PWM5 B	SIO	PIO0	PIO1		USB OVCUR DET
28	SPI1 RX	UART0 TX	I2C0 SDA	PWM6 A	SIO	PIO0	PIO1		USB VBUS DET
29	SPI1 CSn	UART0 RX	I2C0 SCL	PWM6 B	SIO	PIO0	PIO1		USB VBUS EN

(C) 2023, 2024 Pat Deegan

Psychogenic Technologies

Sheet: /RP2040/

File: rp2040.kicad_sch

Title: Tiny Tapeout 4/5 Demo Board

Size: A4 | Date: 2024-04-12 | **Rev: 1.2.2**

KiCad E.D.A. 8.0.7 | Id: 2/2