Raspberry Pi Pico

As soon as the RP2040 has booted PICO_POWER_EN must be pulled high to maintain power supply to the board.

Ensure copper clearance for antenna.

3V3 LDO / "always on" supply / VSYS EN

Provides the "always on" V+ rail (between 1.8V and 3.3V) needed by the system when in low power (shutdown) mode. Nothing draws much power from this rail to ensure that modules are using minimal battery power when idle.

The regulator is supplied by VSYS when VBUS is present, or directly from VBAT otherwise.

Using the built in 3V3_EN signal on the Pico draws too much power in sleep mode so we have our own cut off for VSYS which can completely disconnect the Pico.

User interface

User interface

PCF85063A

I2C: 0x51

1.8-5.5V

VDD CLKO

CLKOUT

SDA INT

SCL OSCO

GND OSC

RTC

Wakeup events

To conserve power the module spends most of its time sleeping.

An on-board RTC will periodically wake the module to take a reading.

The module will also wake when USB power is applied, the user presses the STATUS switch, or when an external trigger fires.

All wake triggers are active high apart from the RTC alarm.

QW/ST / Battery connectors

Battery input voltage between 2V and 5.5V - i.e. a protected LiPo cell or 2/3xAAA battery holder. Battery connector mounting pads connected to ground plane (no thermals) for mechanical strength.
**Enviro Urban (PIM629)**

**PMSA003I particulate sensor**

Datasheet: https://www.mouser.co.uk/datasheet/2/737/4505_PMSA003I_series_data_manual_English_V2_6-2490334.pdf

5V supply for fan only. IO all 3.3V so no level shifting required.

Pin numbers inverted horizontally compared to datasheet description because datasheet is numbers the pins on the device whereas our mating connector is mirrored.

5V power supply for the particulate sensor.

**SPU0410HR5H Analog MEMS microphone + amp**

Datasheet: https://www.mouser.co.uk/datasheet/2/218/know_s_a0010769161_1-2271807.pdf

Amplifier configured for 20dB gain (100k / 10k == 10 x).

**BME280 enviromental sensor**

CSB (chip select) tied to 1V8 to put into I2C mode.

SDO tied to 1V8 selects I2C address 0x77.

BME280 decoupled with C10.