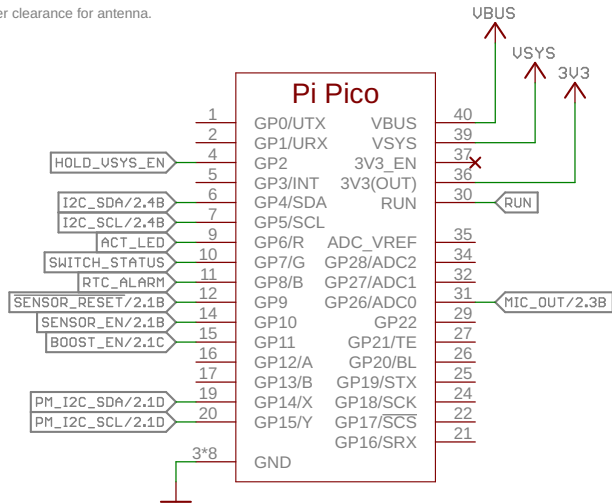# Enviro Urban (PIM629)

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.

Pi Pico

Pin	Signal	Signal	Pin
1	GP0/UTX	VBUS	40
2	GP1/URX	VSYS	39
4	GP2	3V3_EN	37
5	GP3/INT	3V3(OUT)	36
6	GP4/SDA	RUN	30
7	GP5/SCL		
9	GP6/R	ADC_VREF	35
10	GP7/G	GP28/ADC2	34
11	GP8/B	GP27/ADC1	32
12	GP9	GP26/ADC0	31
14	GP10	GP22	29
15	GP11	GP21/TE	27
16	GP12/A	GP20/BL	26
17	GP13/B	GP19/STX	25
19	GP14/X	GP18/SCK	24
20	GP15/Y	GP17/SCS	22
		GP16/SRX	21
3*8	GND		

HOLD_VSYS_EN
I2C_SDA/2.4B
I2C_SCL/2.4B
ACT_LED
SWITCH_STATUS
RTC_ALARM
SENSOR_RESET/2.1B
SENSOR_EN/2.1B
BOOST_EN/2.1C
PM_I2C_SDA/2.1D
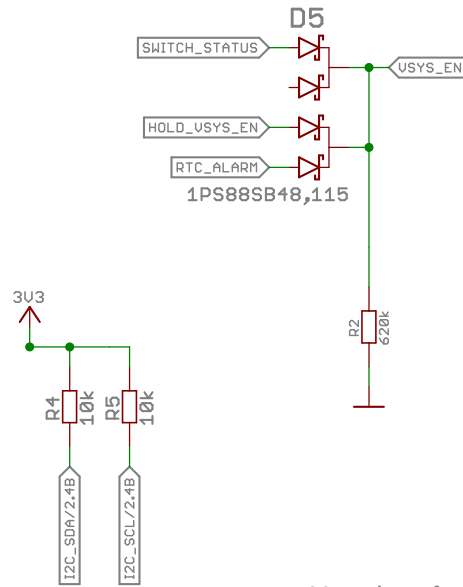PM_I2C_SCL/2.1D

VBUS
VSYS
3V3
RUN
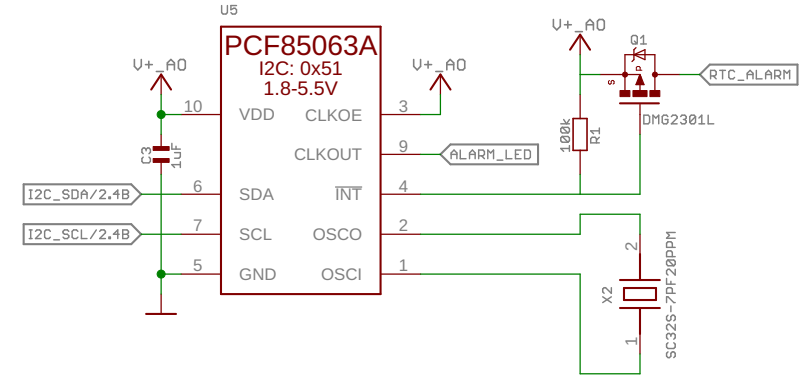MIC_OUT/2.3B

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.

D5
SWITCH_STATUS
HOLD_VSYS_EN
RTC_ALARM
VSYS_EN
1PS88SB48,115

3V3
R4 10k
R5 10k
I2C_SDA/2.4B
I2C_SCL/2.4B

R2 620k

RTC

U5
PCF85063A
I2C: 0x51
1.8-5.5V

Pin		Pin
10	VDD — CLKOE	3
	CLKOUT	9
6	SDA — INT	4
7	SCL — OSCO	2
5	GND — OSCI	1

V+_AO
V+_AO
V+_AO
C3 1uF
I2C_SDA/2.4B
I2C_SCL/2.4B
ALARM_LED
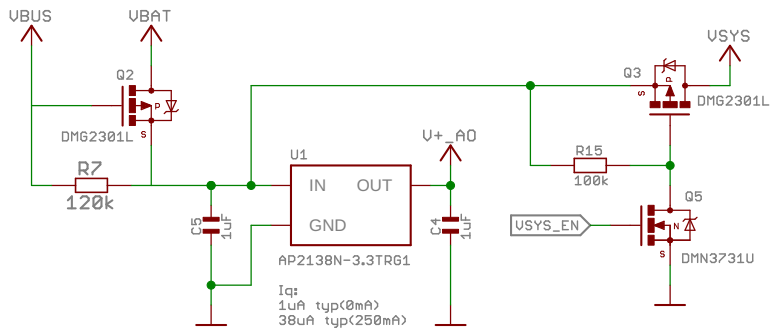
Q1 DMG2301L
RTC_ALARM
R1 100k
X2 SC32S-7PF 20PPM

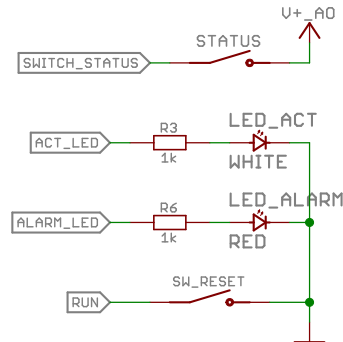## 3V3 LDO / "always on" supply / VSYS EN

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.
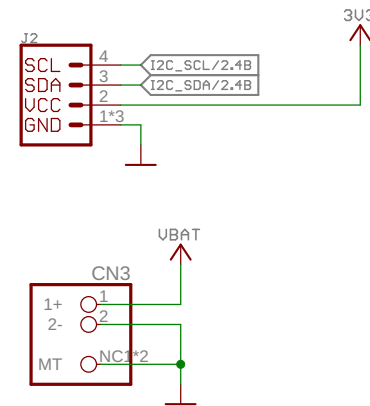
VBUS
VBAT
VSYS
Q2 DMG2301L
R7 120k
C5 1uF
U1 IN OUT GND
AP2138N-3.3TRG1
Iq:
1uA typ(0mA)
38uA typ(250mA)
C4 1uF
V+_AO
R15 100k
Q3 DMG2301L
USYS_EN
Q5 DMN3731U

User interface

STATUS
V+_AO
SWITCH_STATUS

ACT_LED
R3 1k
LED_ACT
WHITE

ALARM_LED
R6 1k
LED_ALARM
RED

RUN
SW_RESET

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.

3V3
J2
4	SCL	I2C_SCL/2.4B
3	SDA	I2C_SDA/2.4B
2	VCC	
1*3	GND	

VBAT
CN3
1	1+
2	2-
NC1*2	MT

PIMORONI
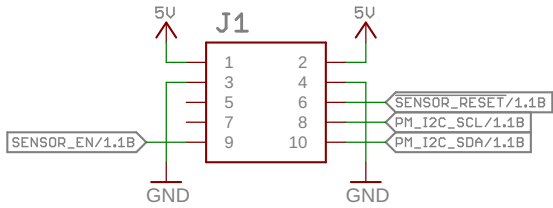
Enviro Urban (PIM629)

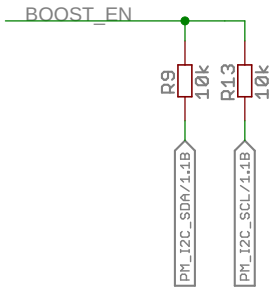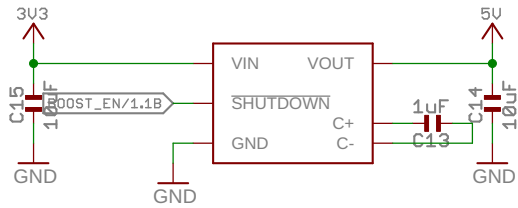## PMSA003I particulate sensor

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 3V3 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.

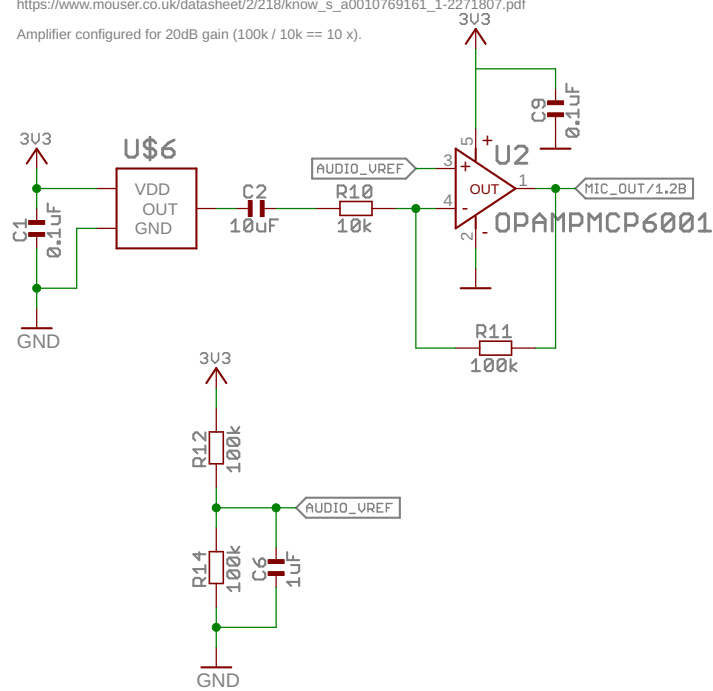5V power supply for the particulate sensor.

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