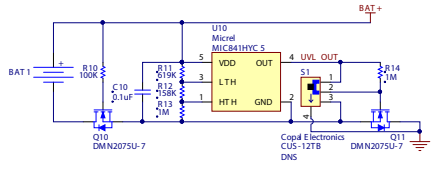
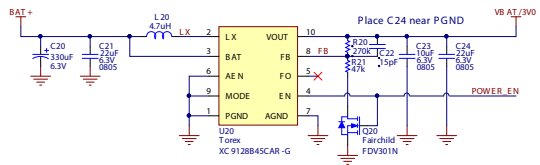
Reverse Voltage Protection and Under Voltage Lockout

Q10 provides efficient protection in case of battery reversal. Make sure to use a NFET with a low VGS_TH. U10 and Q11 provide an undervoltage lockout for graceful shutdown when the batteries can no longer supply enough power to the sensors. The lock out is set at 1.9V and re-enable will occur at 2.2V.

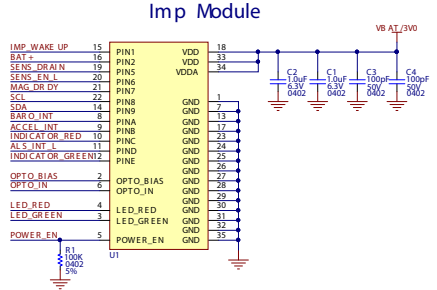


Power Supply

We chose the XC9128 because it is low cost, efficient, has a low Iq and has passthru when it is disabled. To save power when it is disabled we also turn off the leakage path through the FB network. Alkaline batteries can have a very high output impedance so we recommend at least 220uF on the battery input to support high current peaks.

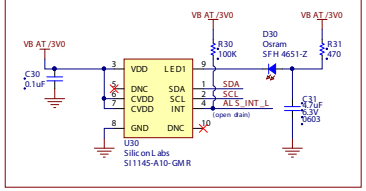


Imp Module



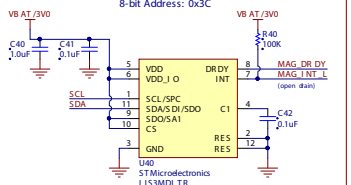
Digital Ambient Light Sensor

8-bit Address: 0xC0



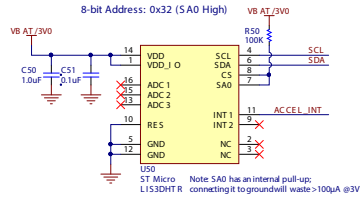
Magnetometer

8-bit Address: 0x3C



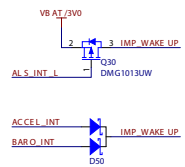
3-Axis Accelerometer

8-bit Address: 0x32 (SA0 High)



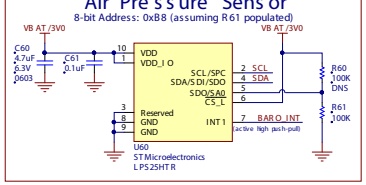
Interrupt ORing Circuit

The Imp can only wake on a logic high. Most sensors in this design can be configured for that polarity, but default to active low and use an open drain topology - causing them to burn power while low. For that reason, we use PFETs to invert the logic and combine those interrupts (and the barometer and accelerometer's active high interrupts, using diodes) en route to Pin 1.



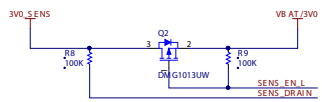
Air Pressure Sensor

8-bit Address: 0xB8 (assuming R61 populated)

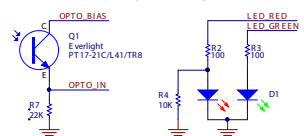


Power Gate

Gate power to the chirp moisture sensor, otherwise it continously drains lots of power. We also have a discharge path to quickly discharge the rail. This is not required for applications which gurantee sleep periods long enough for the sensor rail to discharge on its own.

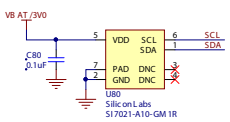


Blink Up Components



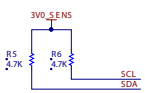
Temperature+Humidity Sensor

8-bit Address: 0x80



I2C Pull-up Resistors

I2c rails are connected to the power gate.
Otherwise Chirp sensor draws 300uA continiously

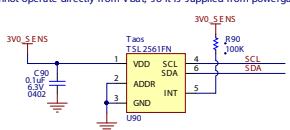


Mounting Hole

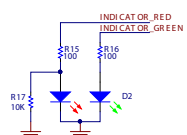
Digital Ambient Light Sensor

8-bit Address: 0x52

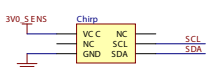
The TSL2561 was selected for it's wide dynamic range
It cannot operate directly from Vbat, so it is supplied from powergate



Indicator LEDs



Connection for Chirp moisture sensor



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