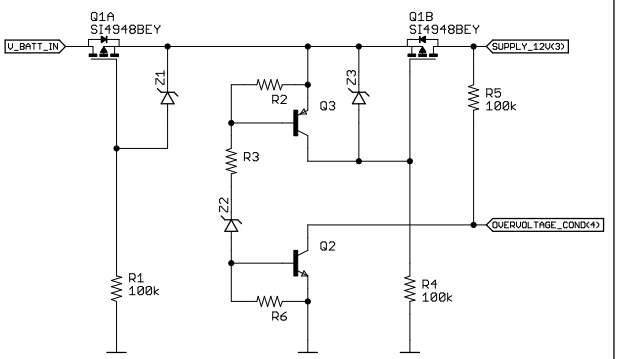
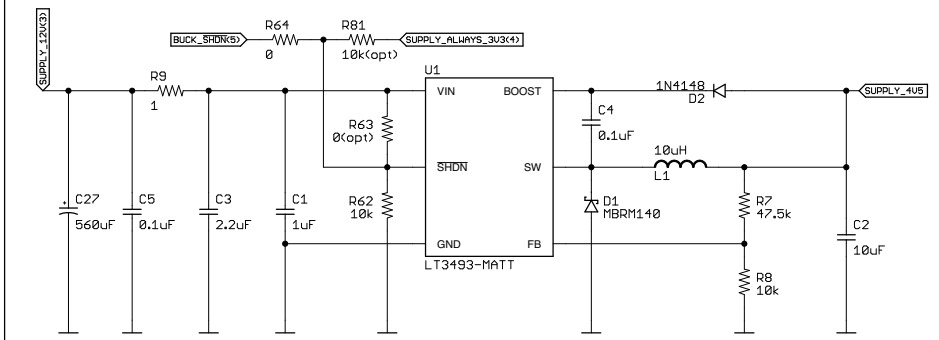
Reverse Polarity / Overvoltage Protection

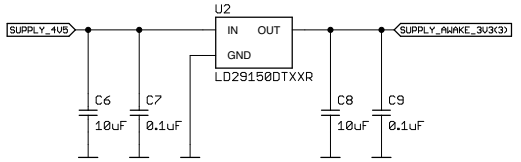


Buck Regulator

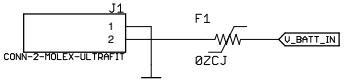


> R63 can be populated with a 0 ohm resistor if R62 is unpopulated, this keeps buck always enabled
> to isolate the uC, R64 should be left unpopulated if R63 is populated
> if the power sequencing fails with the 10k pull down to ground (uC initially powered by low current supply), populate RXX to pull SHDN pin to 3V3, uC will then pull down SHDN to disable buck

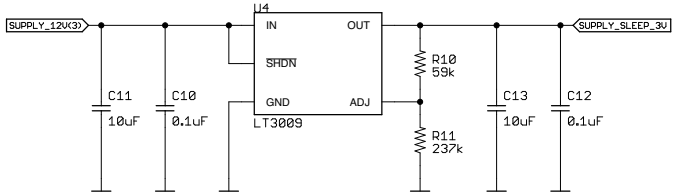
Primary Linear Regulator



Power Input

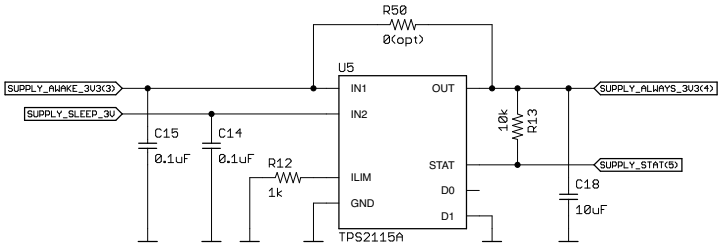


Low Current Sleep Supply Linear Regulator



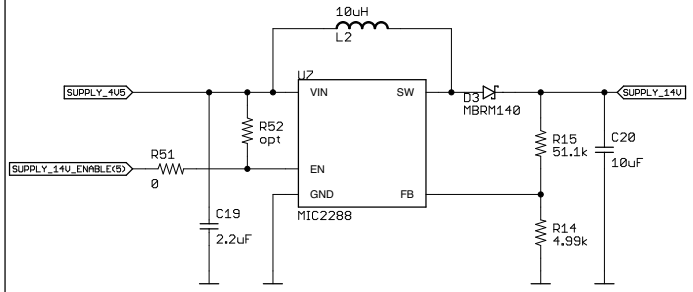
> LT3009 holds ADJ pin to 600mV referenced to ground, leakage ~300pA @ 25C
> Vout = 600mV * (1 + R10/R11) - (I_adj * R11)
> With values of R10, R11, Vout ~ 3.01V
> ~2.53uA will flow through R11

Autoswitching Power Mux



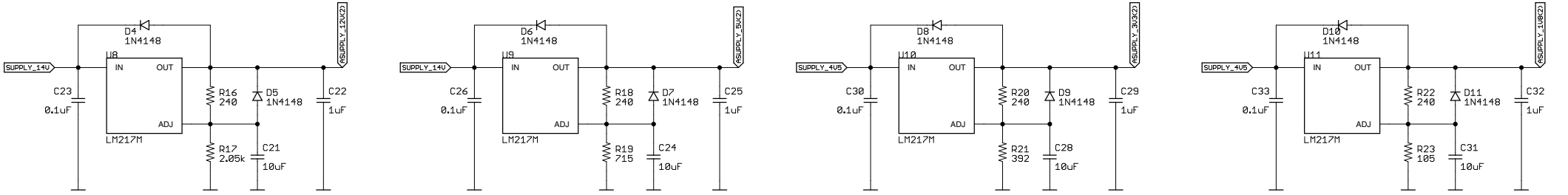
> D0 is pulled high internally, left floating intentionally
> With D0 = 1, D1 = 0, IN2 < IN 1: OUT = IN1 and IN2 > IN1 : OUT = IN2
> SUPPLY_STAT low when OUT = IN1, high when OUT = IN2 (open drain output)
> R12 sets current limit to 500/R12 = 500mA
> R50 can be used to bypass the mux if the mux is unpopulated

Sensor Supply Boost Converter



> should be controllable using logic level from microcontroller, R52 can be used to force enable if otherwise

Sensor Supplies



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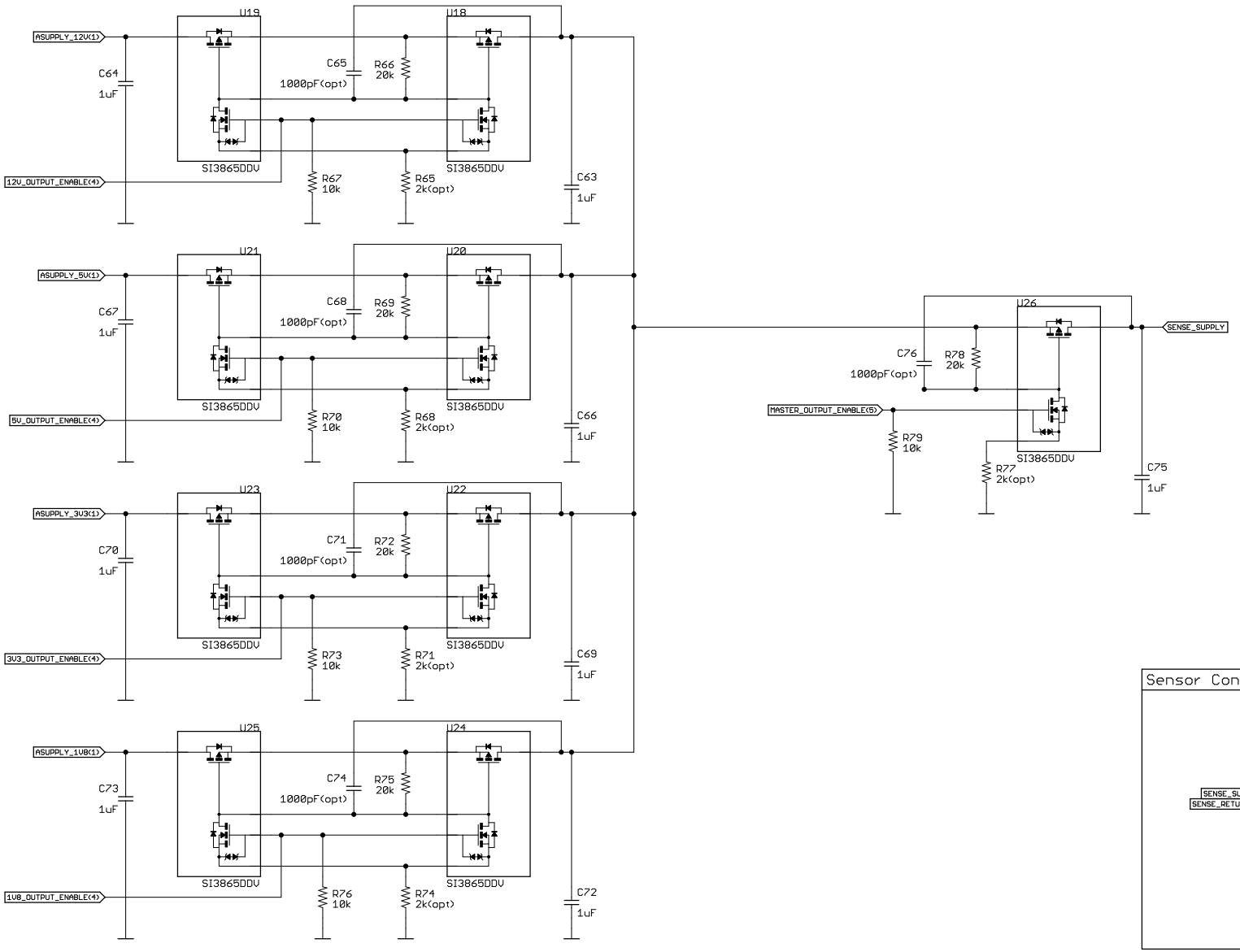
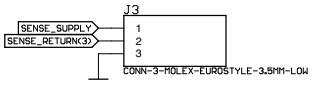
Output Supply Mux



Sensor Connector



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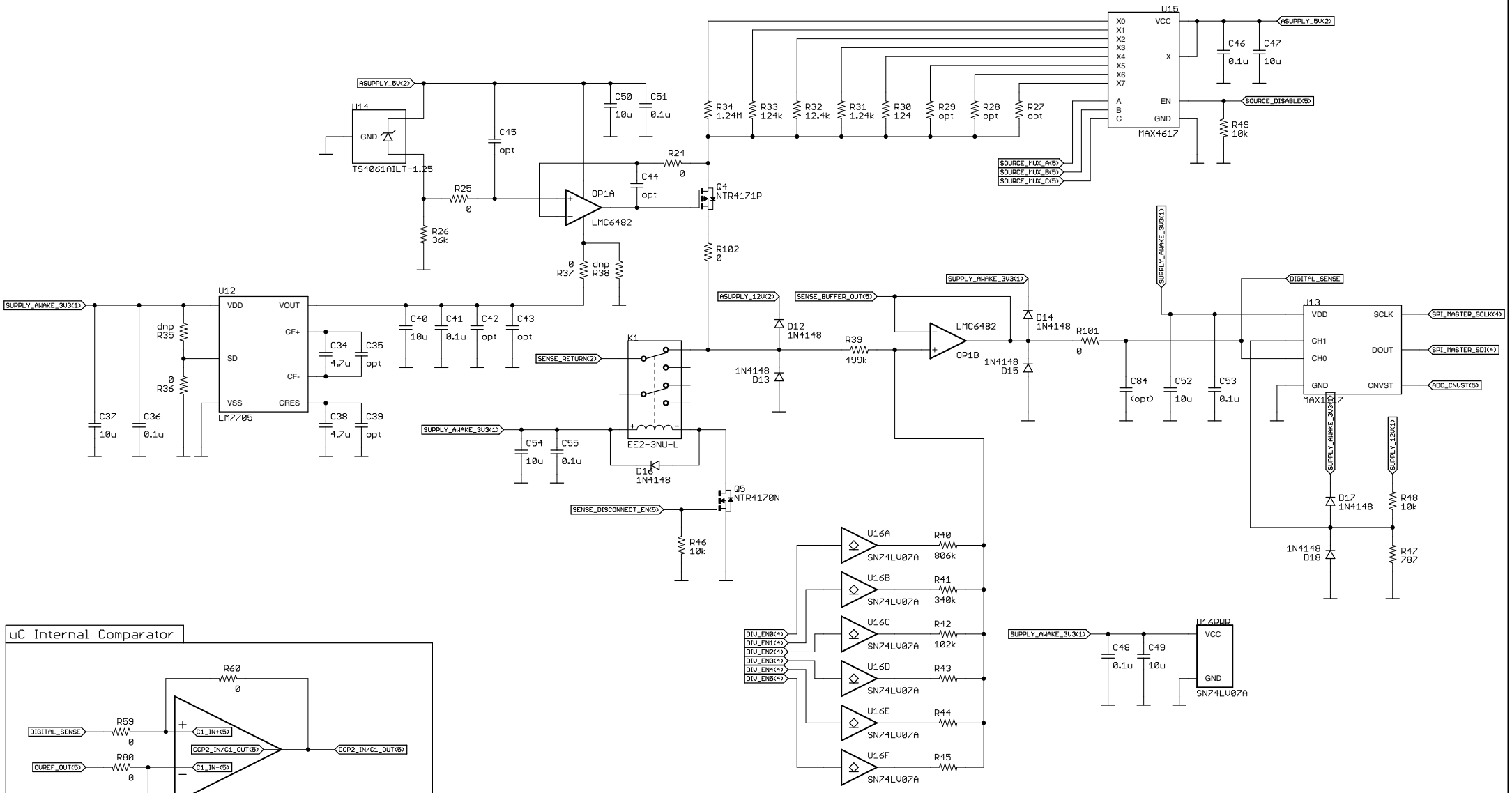
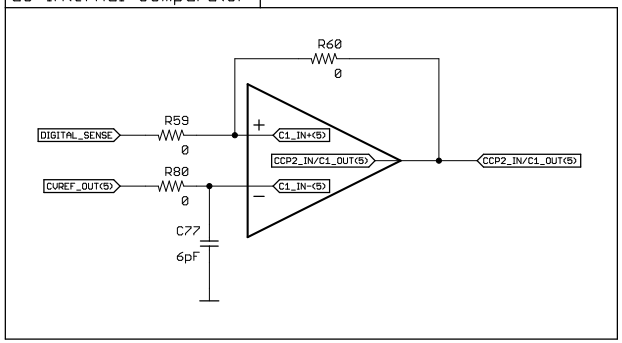
Sensor Measurement Analog Front-End



uC Internal Comparator



> R101, C84 form an optional low pass filter network that can be used to ensure phase margin
> R102 can be left unpopulated to test current source operation

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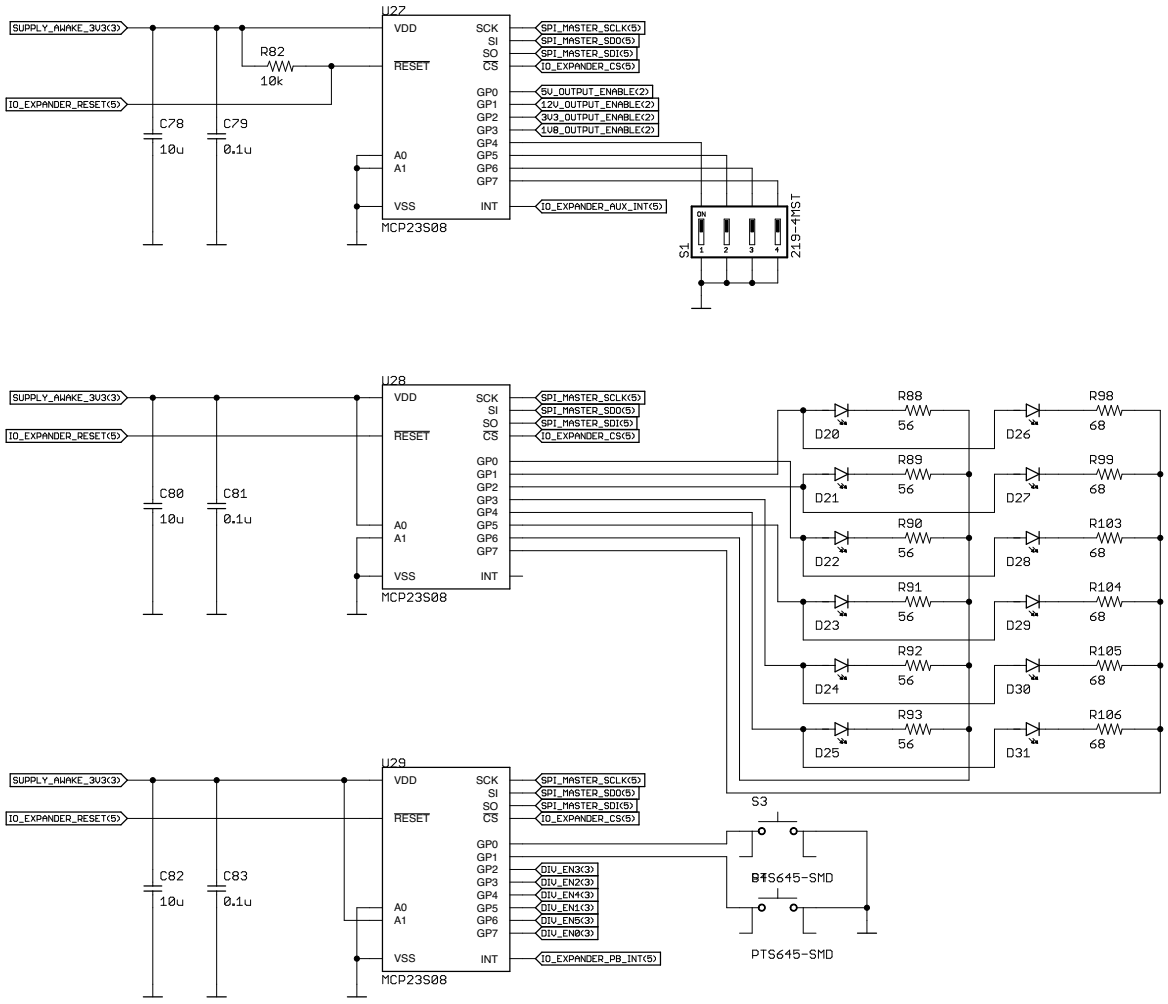
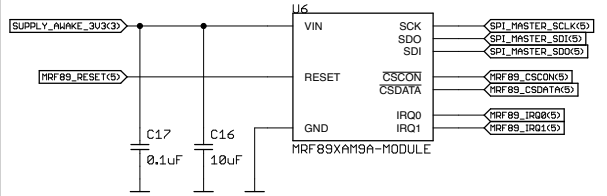
I/O Expanders

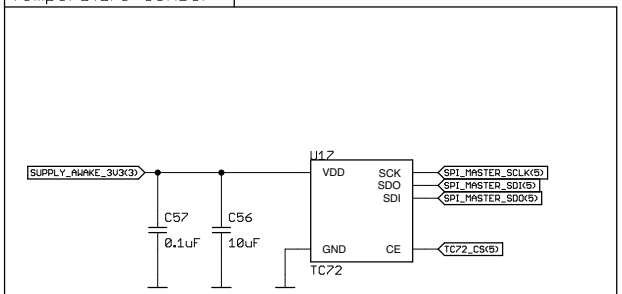


> D20-D25 are Green (LG R971-KN-1), D26-D31 are Red (LS R976-NR-1)
> U27,U28 should have interrupts configured as open-drain, this allows both devices to assert the interrupt line

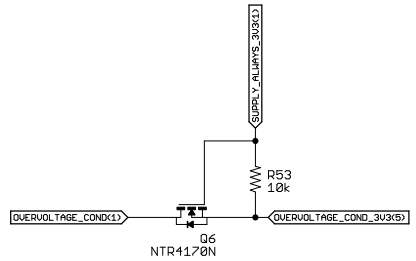
915MHz Packet Radio



Temperature Sensor



Overvoltage Cond. Level Shifting



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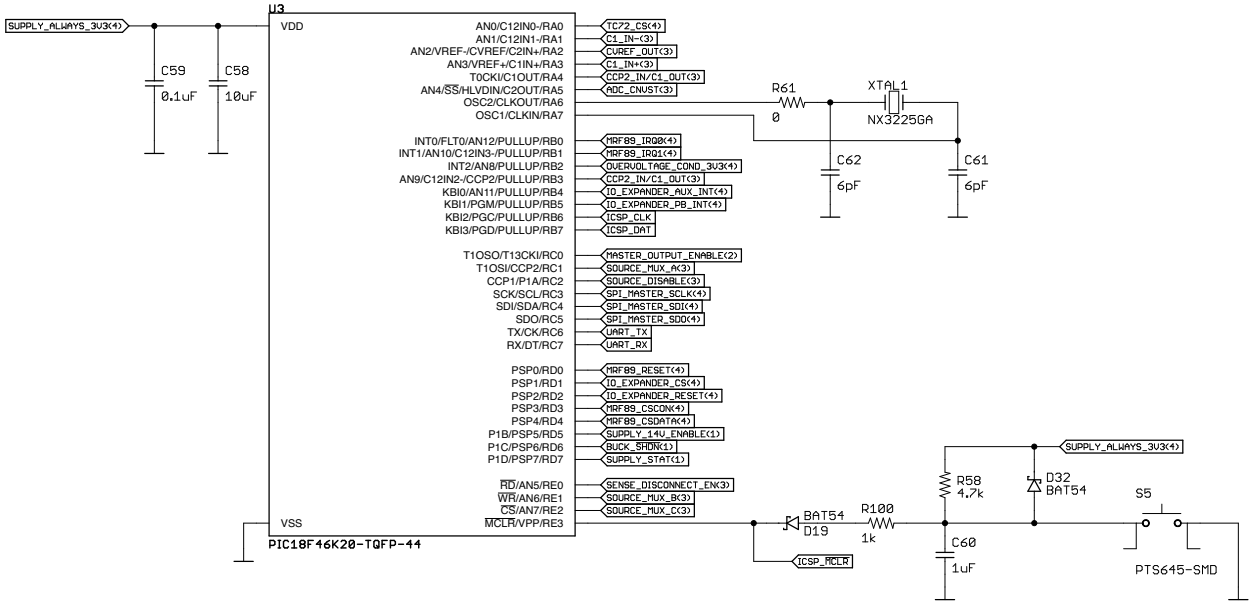
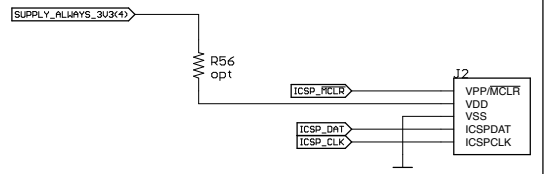
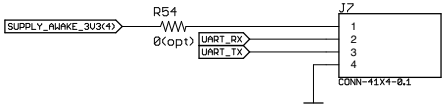
Microcontroller / Supporting Hardware



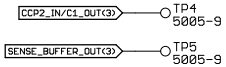
Programming Header



Serial Data Header



Test Points



> R60, R59 can be used to set hysteresis for comparator module, if set to specified values comparator is bypassed
> ensure inputs used for compraator are set as inputs (high-z) during analog sensor measurements, or ADC measurements may be obscured
> R61 is required if XTAL1 has low drive level
> XTAL1 is 16MHz
> BUCK_SHDN is pulled low externally, pull high to enable

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