


RASPBERRY PI ZERO POWER SENSOR HAT

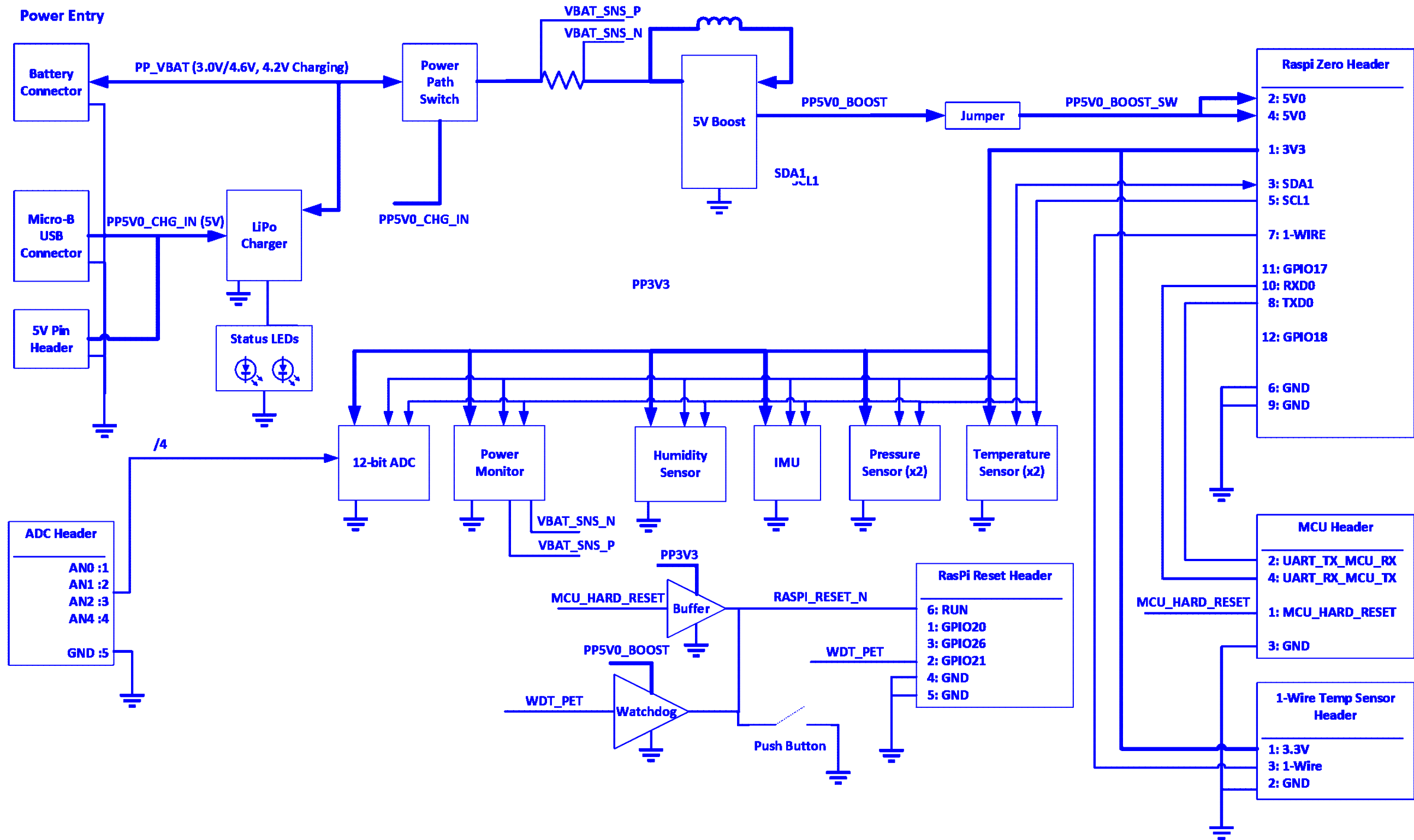
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Raspberry Pi Zero Power/Sensor HAT Block Diagram



BLOCK_DIAGRAM

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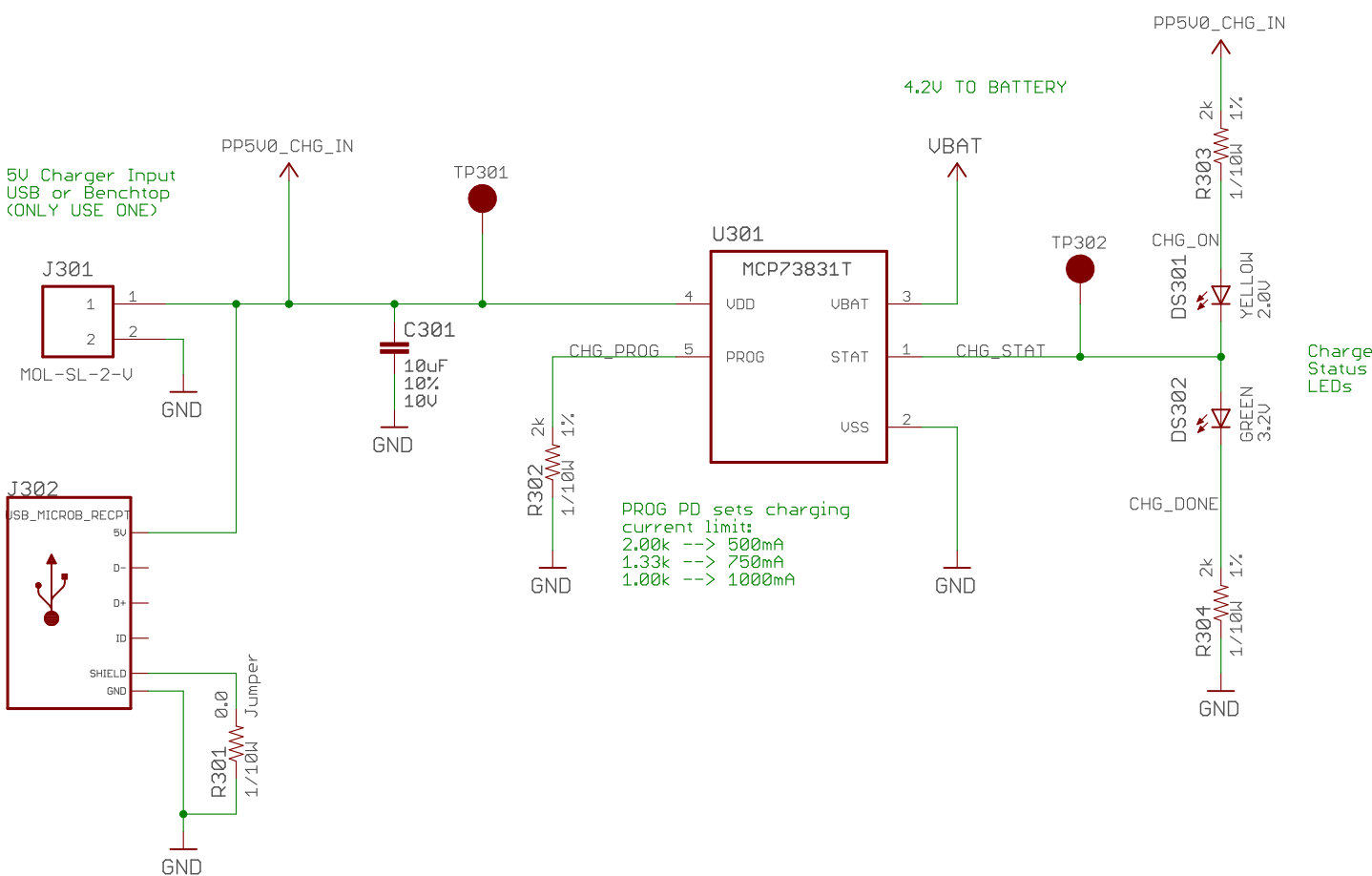
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LiPo Battery Charger and Reset Circuitry

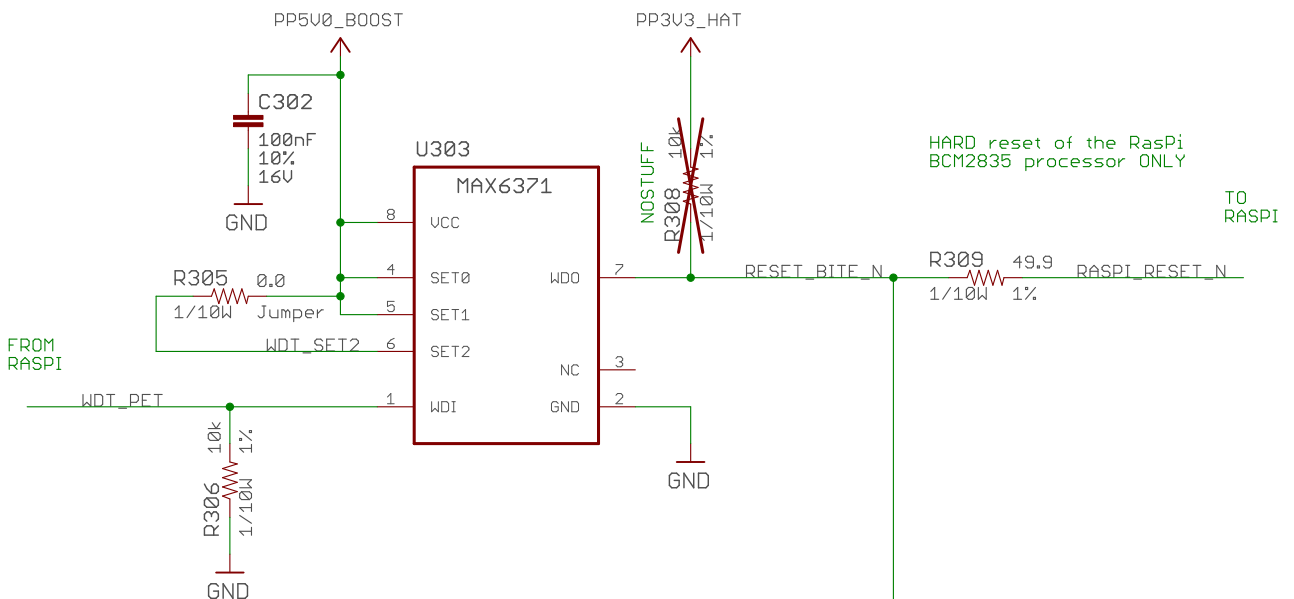
1-cell LiPo Battery Charger



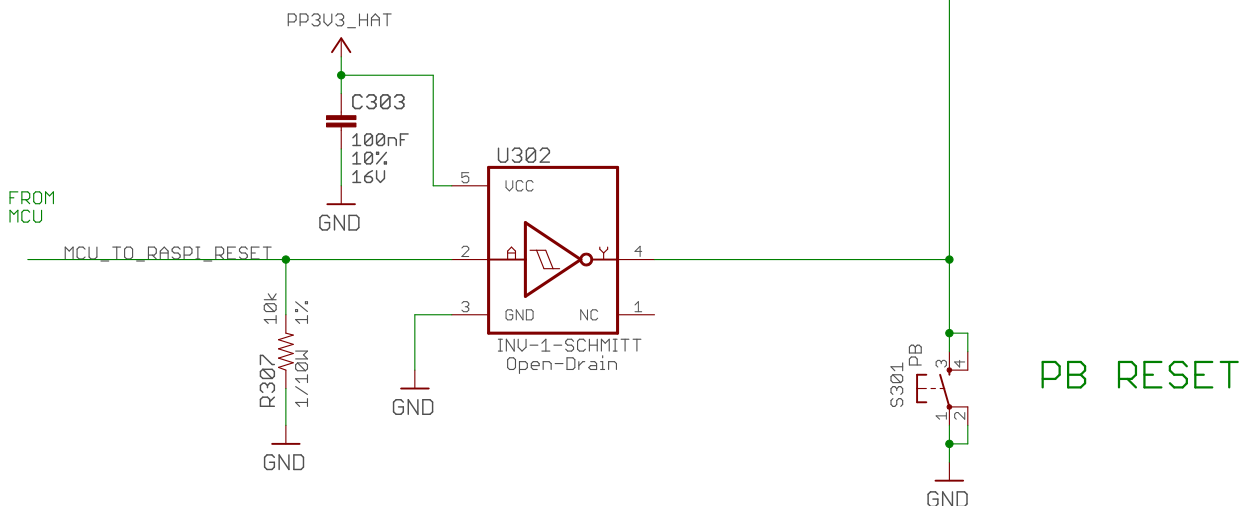
WATCHDOG TIMER

WDO is OD active low for at least 100u
Power-on delay is minimum of 60s

SET2	SET1	SET0	Mode
UCC	UCC	UCC	60s timeout
GND	UCC	UCC	Disabled



MCU to RASPI RESET



LIPO_CHARGER_AND_RESET

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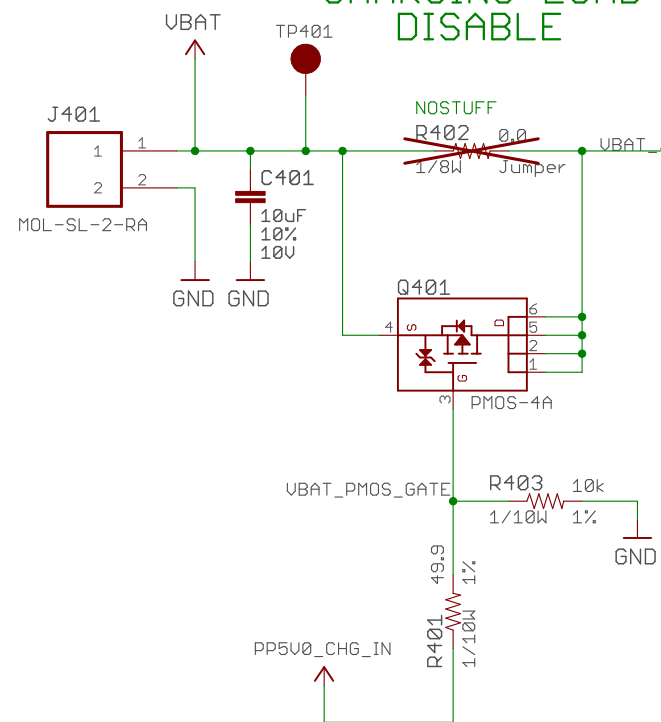
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POWER ENTRY, 5V BOOST, AND 3.3V LDO

LiPo Battery: ~3.0V-4.2V or
3xAA Battery: ~3.7V to 4.6V
Battery Current: ~400mA (AUG)
~775mA (PEAK)

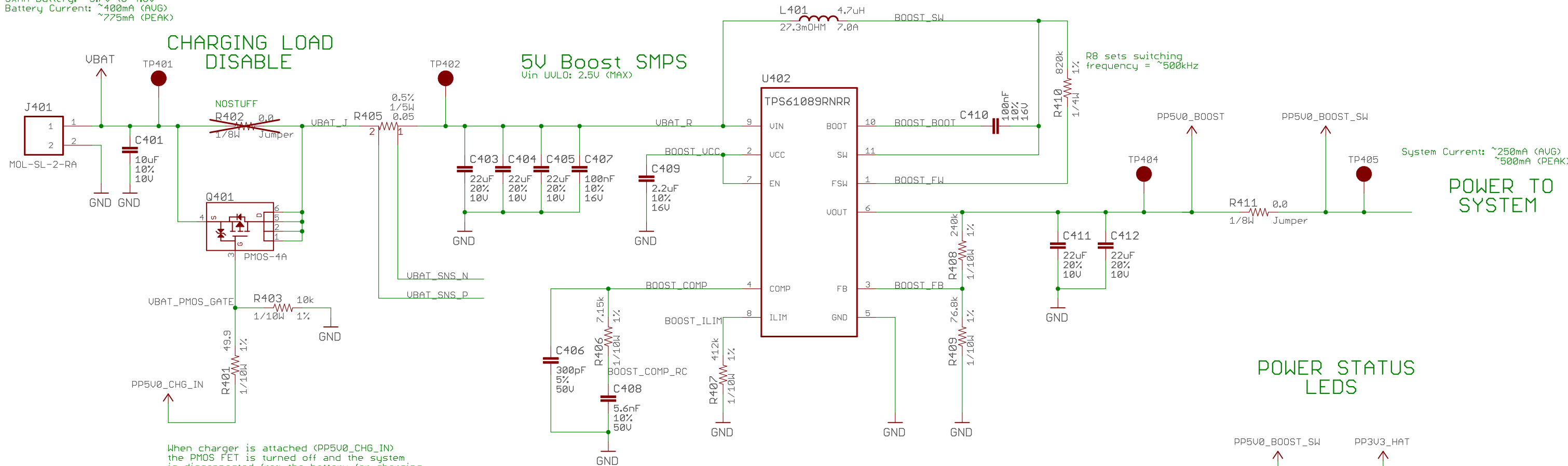
CHARGING LOAD DISABLE



When charger is attached (PP5V0_CHG_IN)
the PMOS FET is turned off and the system
is disconnected from the battery for charging
(if this is not desired, remove Q401 and stuff R402)

5V Boost SMPS

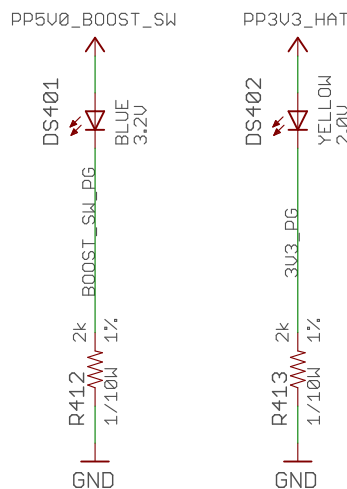
Vin UVL0: 2.5V (MAX)



System Current: ~250mA (AUG)
~500mA (PEAK)

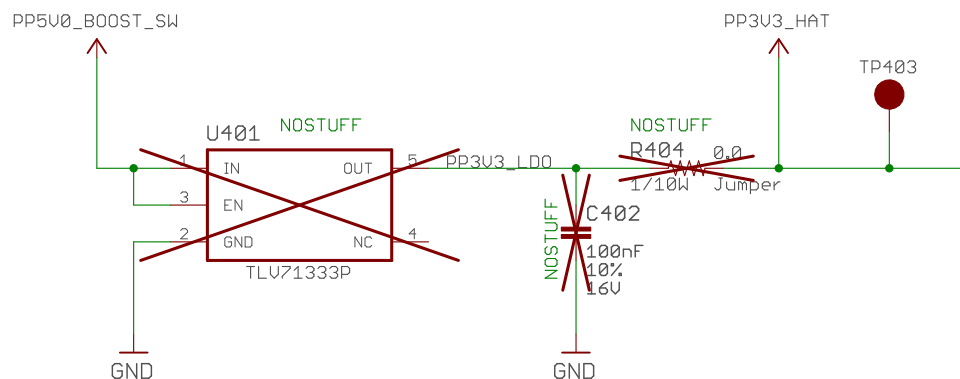
POWER TO SYSTEM

POWER STATUS LEDS



3.3V LDO (No RasPi Operation)

Placeholder for 3.3V rail supply if the
board is used without a RasPi, since the
RasPi supplies the 3.3V rail during operation



POWER_ENTRY_BOOST_LDO

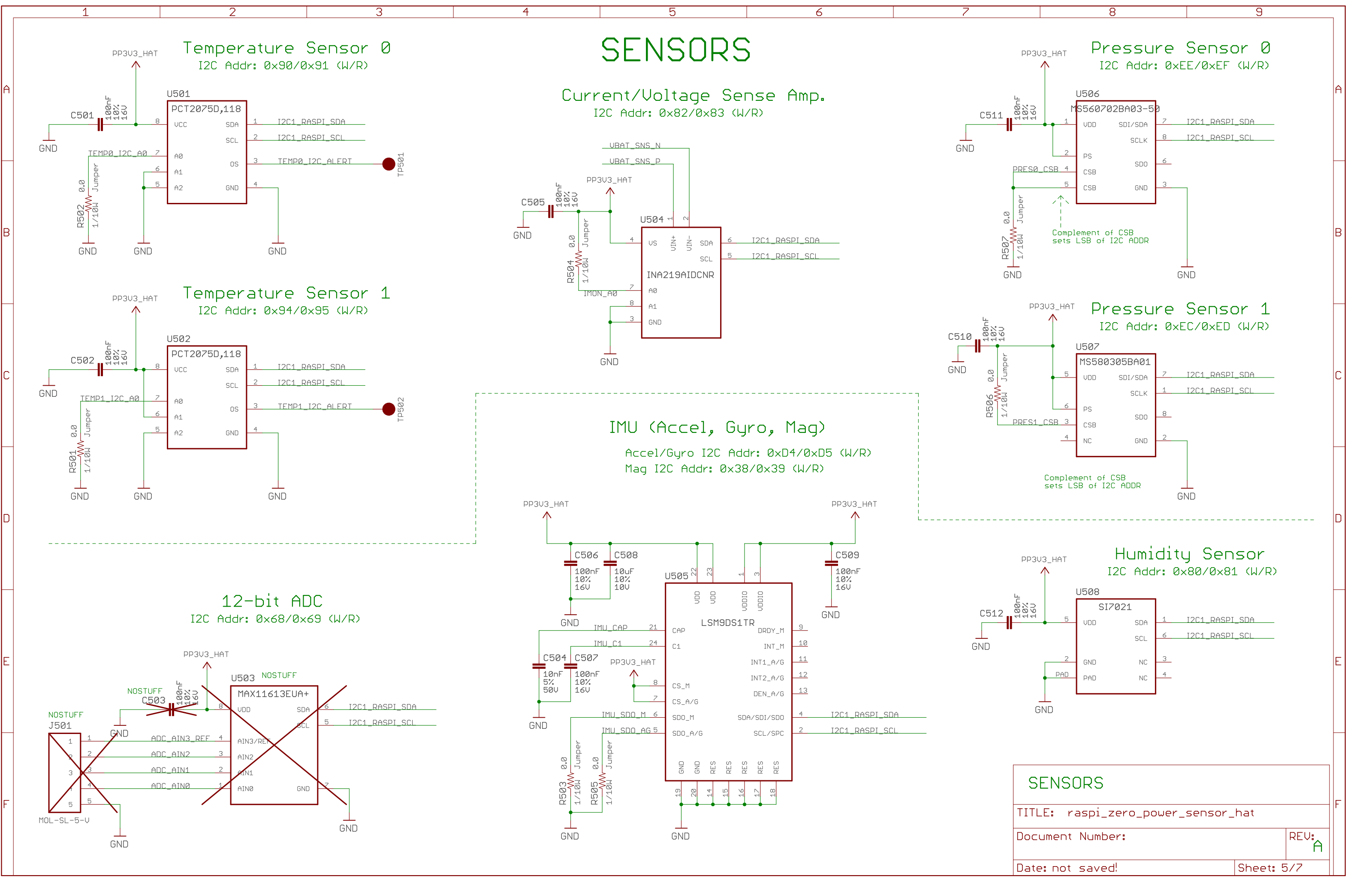
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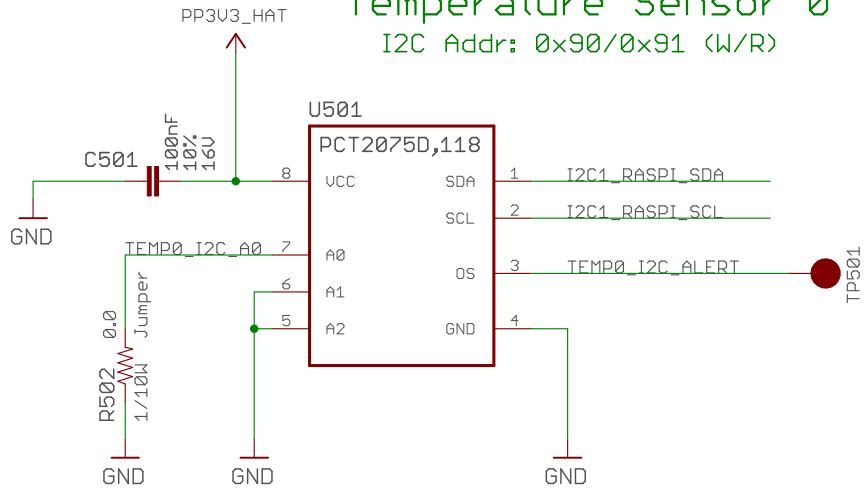
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SENSORS

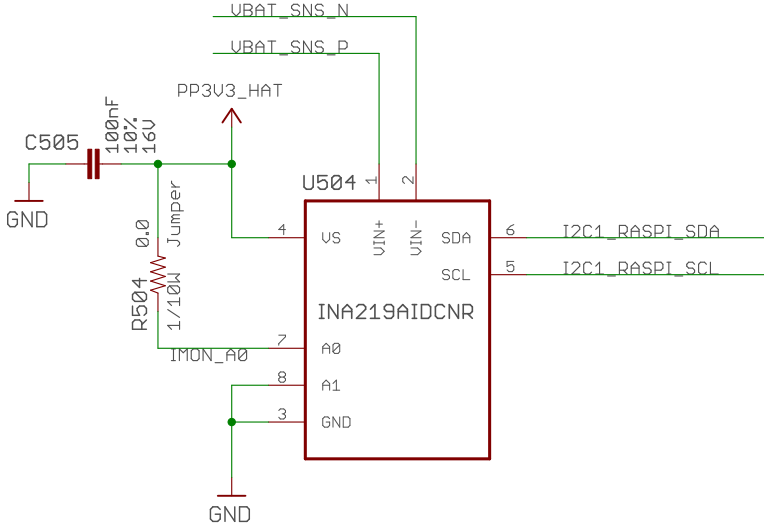
Temperature Sensor 0

I2C Addr: 0x90/0x91 (W/R)



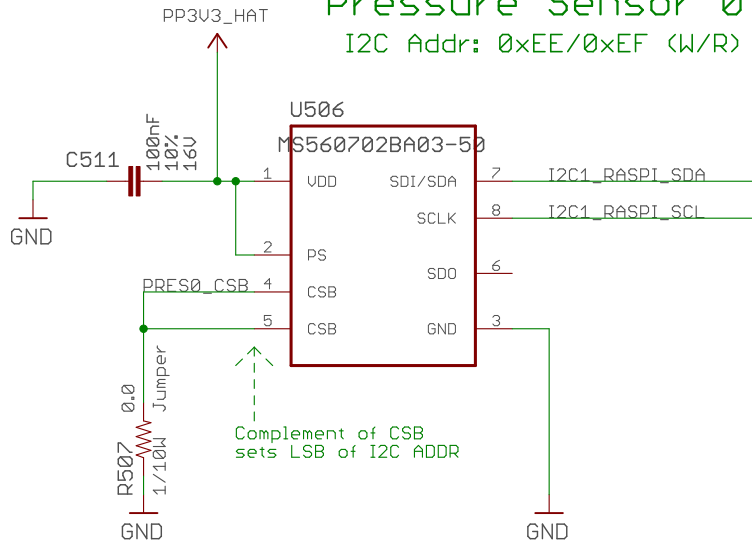
Current/Voltage Sense Amp.

I2C Addr: 0x82/0x83 (W/R)



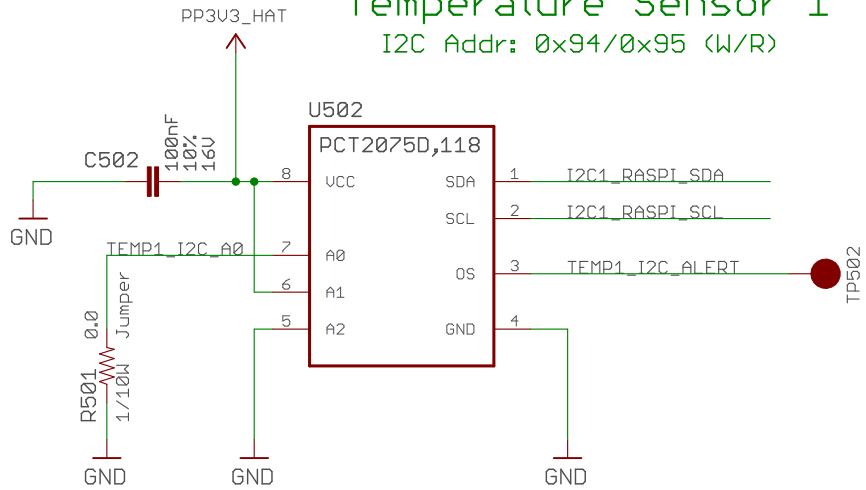
Pressure Sensor 0

I2C Addr: 0xEE/0xEF (W/R)



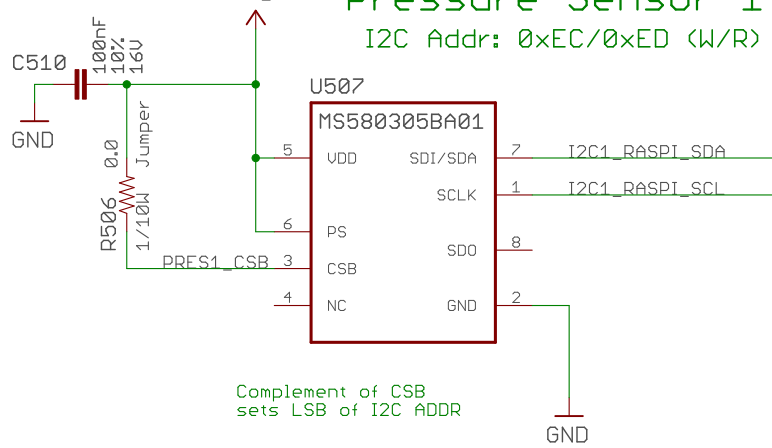
Temperature Sensor 1

I2C Addr: 0x94/0x95 (W/R)



Pressure Sensor 1

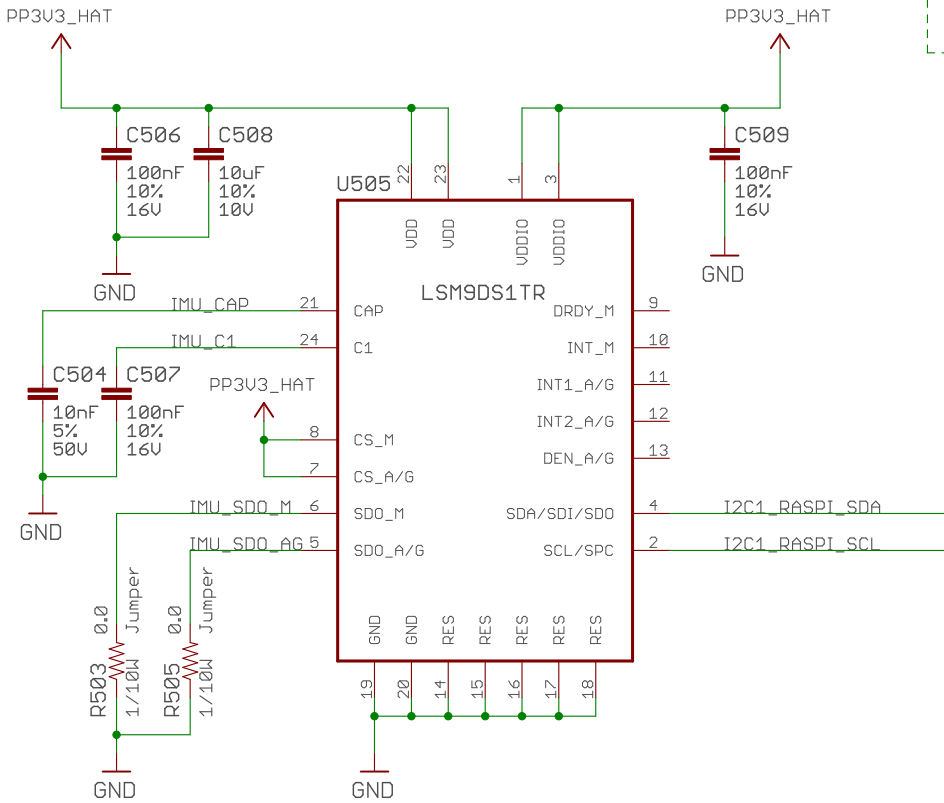
I2C Addr: 0xEC/0xED (W/R)



IMU (Accel, Gyro, Mag)

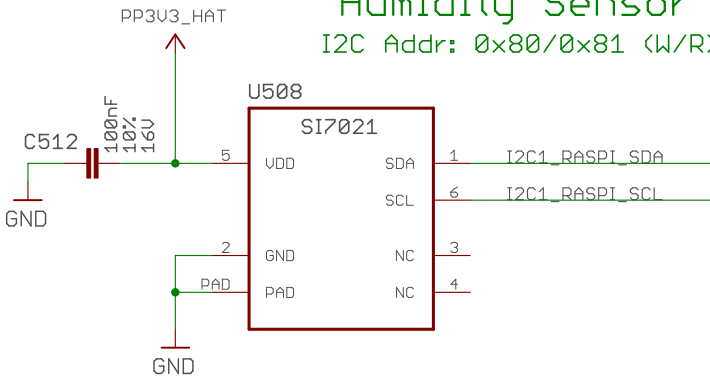
Accel/Gyro I2C Addr: 0xD4/0xD5 (W/R)

Mag I2C Addr: 0x38/0x39 (W/R)



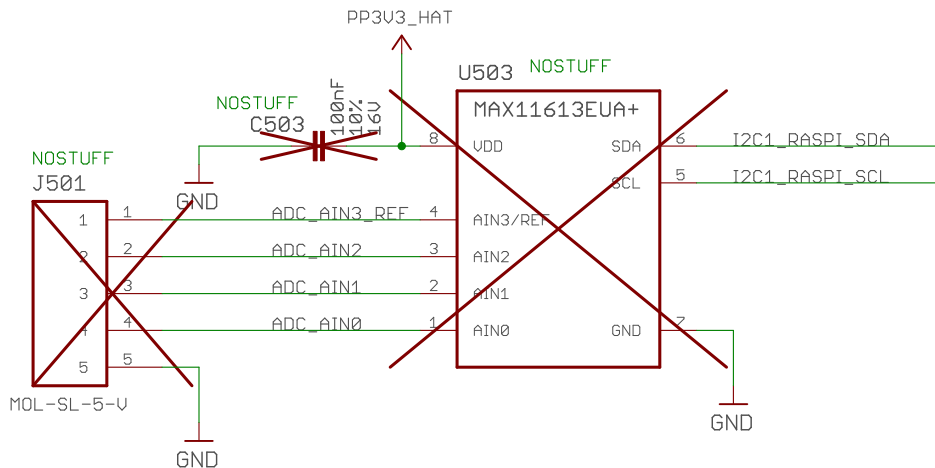
Humidity Sensor

I2C Addr: 0x80/0x81 (W/R)



12-bit ADC

I2C Addr: 0x68/0x69 (W/R)



SENSORS

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CONNECTOR ASSEMBLY and EXTERNAL SENSORS

J301: 5V Charger Input

BOM701	SL 70066 2PIN HOUSING	'Digi-key	'WM2900-ND
BOM702	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM703	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND

3x 12mm Nylon Standoffs (Top Righ, Bottom Right, Bottom Left)

Not listed on BOM, enough for 6 HATs (Amazon: B01HBYDH70)

J401: 1-cell Li-Ion Battery Input

BOM704	SL 70066 2PIN HOUSING	'Digi-key	'WM2900-ND
BOM705	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM706	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND

2000mAh 3.7V Battery ordered from Adafruit (Part Number: 2011)

J501: ADC Inputs

BOM708	SL 70066 2PIN HOUSING	'Digi-key	'WM2900-ND
BOM709	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM710	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM711	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM712	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM713	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND

J601: RasPi Power/GPIO Header

BOM714	HEADER-RECT-MALE-2X6	'Digi-key	'952-2125-ND
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J602: 1-Wire Temperature Sensor

BOM715	SL 70066 3PIN HOUSING	'Digi-key	'WM2901-ND
BOM716	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM717	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM718	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM719	1-Wire Temperature Sensor	'Digi-key	'DS18B20+-ND
BOM720	1-Wire Temperature Sensor	'Digi-key	'DS18B20+-ND

J603: MCU IO

BOM721	SL 70066 4PIN HOUSING	'Digi-key	'WM2902-ND
BOM722	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM723	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM724	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND
BOM725	SL 70058 GOLD CRIMP	'Digi-key	'WM2512CT-ND

J604: RasPi Reset/GPIO Header

BOM726	HEADER-RECT-MALE-2X3	'Digi-key	'952-2120-ND
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J605: I2C Debug Header

BOM727	HEADER-RECT-MALE-4X1	'Digi-key	'ST0111CT-04-ND
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ASSEMBLY_COMPONENTS

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