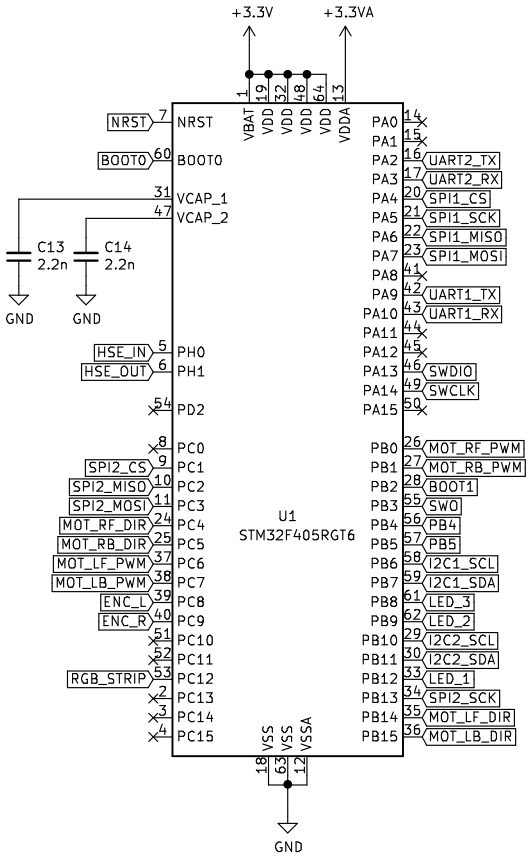
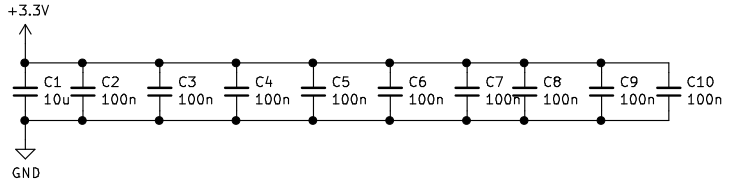
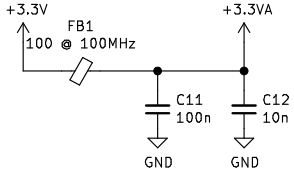
STM32F405 MCU



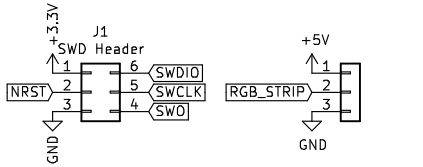
MCU VDD Filter



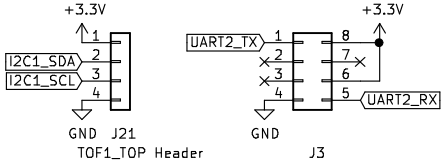
VDA Filter

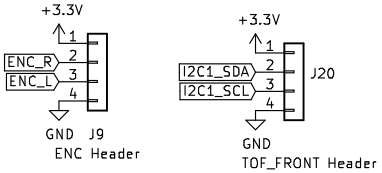


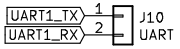
MCU Connectors

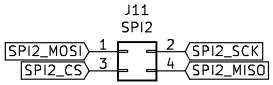


Read ST AN4989

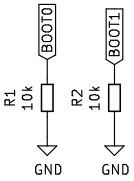




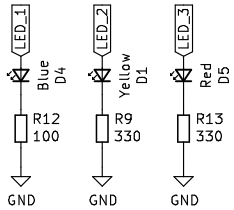




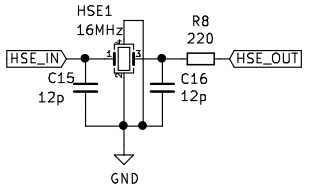
BOOT Pins



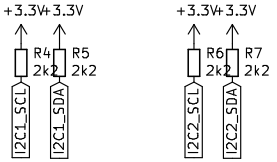
Onboard LEDs



MCU Crystal



I2C Pull-up



Sheets

Sheet: RPI	Sheet: Motors	Sheet: Power	Sheet: Sensors
File: rpi.sch	File: motors.sch	File: power.sch	File: sensors.sch

Buses

I2C1 = master, communication with peripherials
I2C2 = slave, communication with RPI

SPI1 = master, communication with RPI (tbd)
SPI2 = master, communication with peripherials
SPI3 = MOSI for RGB

UART1 = Serial debuging
UART2 = Serial with ESP01

Connectors

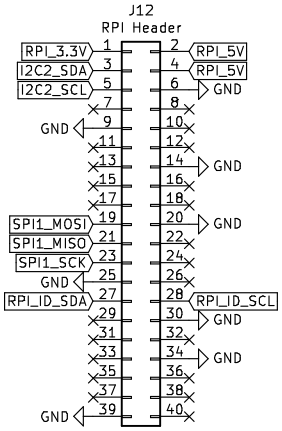
? x RBG Led Connector(s) (3)
4 x Motor Connectors (2)
2 x I2C Distance Sensors (4)
? x Front White Led (2)
? x GPIO Pins

Sheet: /
File: v1.sch

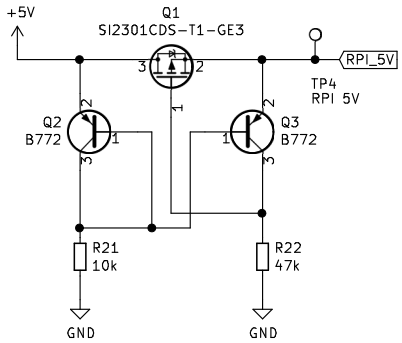
Title: Commodity – Microcontroller

Size: A4	Date: 2020-07-09	**Rev: v1**
KiCad E.D.A. kicad 5.1.5+dfsg1-2build2		Id: 1/5

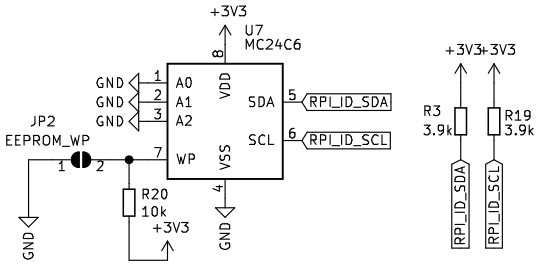
RPI IHeader



RPI Ideal Diode

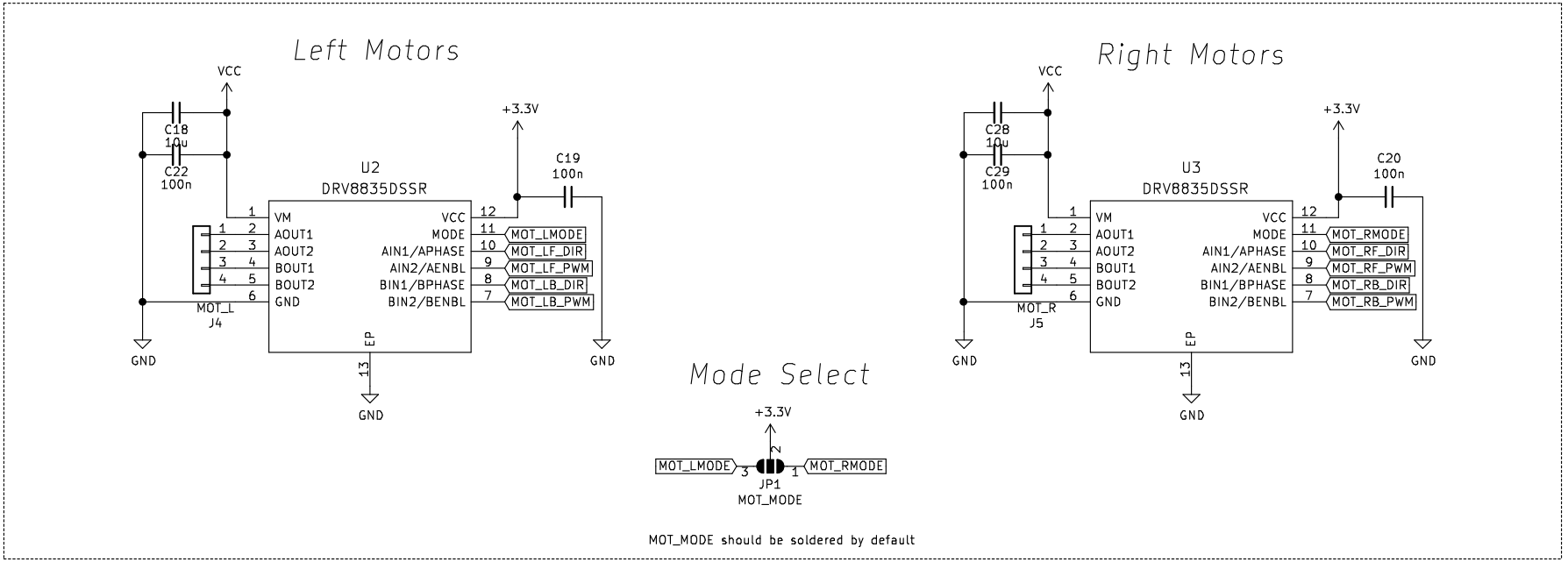


RPI HAT EEPROM



RPI board size: 65x56mm (87x56 with USB)
RPI hole2hole: 58x49
RPI Hole 2 Con: 3.54mm

Sheet: /RPI/ File: rpi.sch		
Title: Commodity – Raspberry PI		
Size: A4	Date: 2020-07-17	**Rev: v1**
KiCad E.D.A. kicad 5.1.5+dfsg1-2build2		Id: 2/5



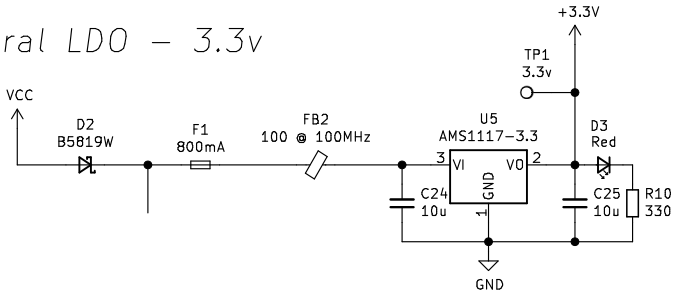
Encoders

DRV8835 Dual Low-Voltage H-Bridge IC

Datasheet: https://www.ti.com/lit/ds/symlink/drv8835.pdf
Sample Application: https://www.ti.com/lit/ug/slvu694/slvu694.pdf
Pololu Shield: https://www.pololu.com/file/0J803/drv8835-dual-motor-driver-shield-schematic.pdf

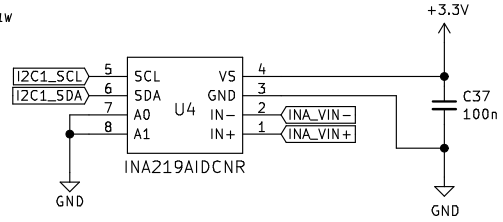
Sheet: /Motors/		
File: motors.sch		
Title: Commodity – Motors		
Size: A4	Date: 2020-07-10	**Rev: v1**
KiCad E.D.A. kicad 5.1.5+dfsg1-2build2		Id: 3/5

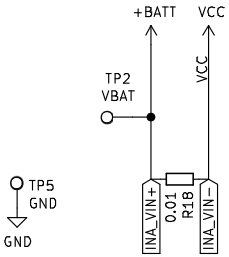
General LDO – 3.3v



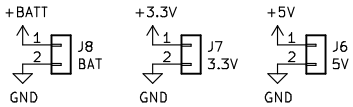
Power Monitor

I2C Address: 0x40
R_shunt = 0.10hm, 2512 @ 1W





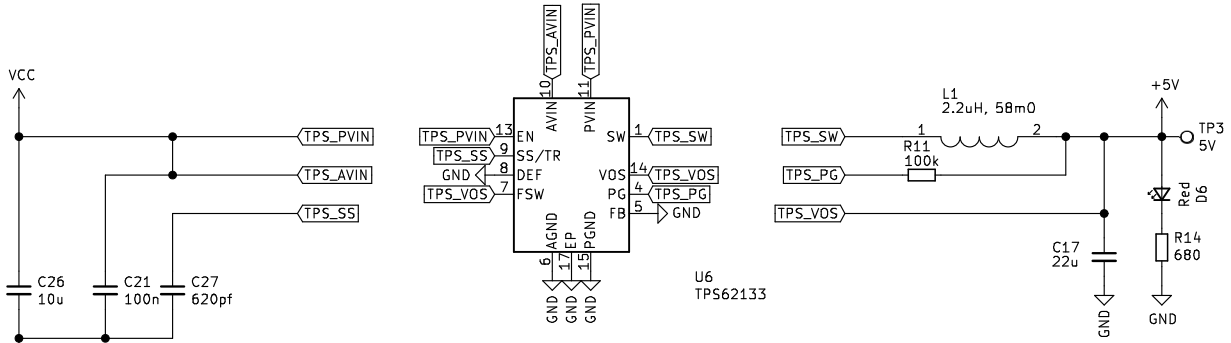
Power Connectors



Battery Buck – 5v

TPS6213x 3-V to17-V, 3-A Step-Down Converter In 3x3 QFN Package

Design: https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=83210779DEE30CCE
Datasheet: https://www.ti.com/lit/ds/symlink/tps62133.pdf
Reverse Polarity Protection: https://www.ti.com/lit/an/slva139/slva139.pdf
Max Ripple: 5% @ 5V



Sheet: /Power/		
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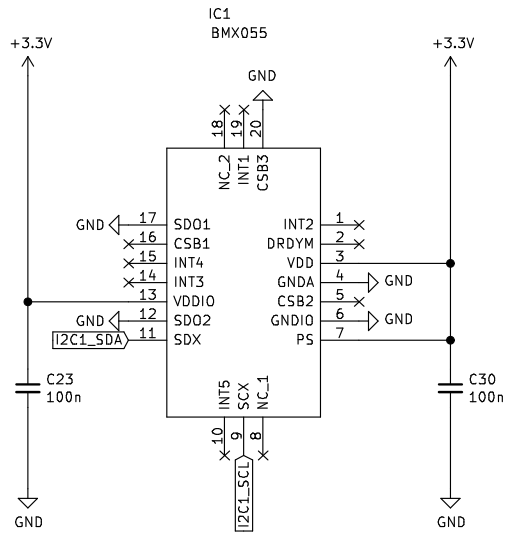
Title: Commodity – Power		
Size: A4	Date: 2020-07-13	**Rev: v1**
KiCad E.D.A. kicad 5.1.5+dfsg1-2build2		Id: 4/5

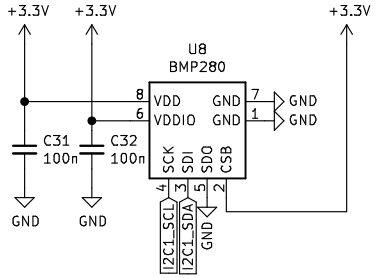
9 Axis IMU

Accelerometer: 0x18
Gyroscope: 0x68
Magnetometer: 0x10



Environment Sensor

I2C Address: 0x76



Sheet: /Sensors/		
File: sensors.sch		
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Size: A4	Date: 2020-07-13	**Rev: v1**
KiCad E.D.A. kicad 5.1.5+dfsg1-2build2		Id: 5/5