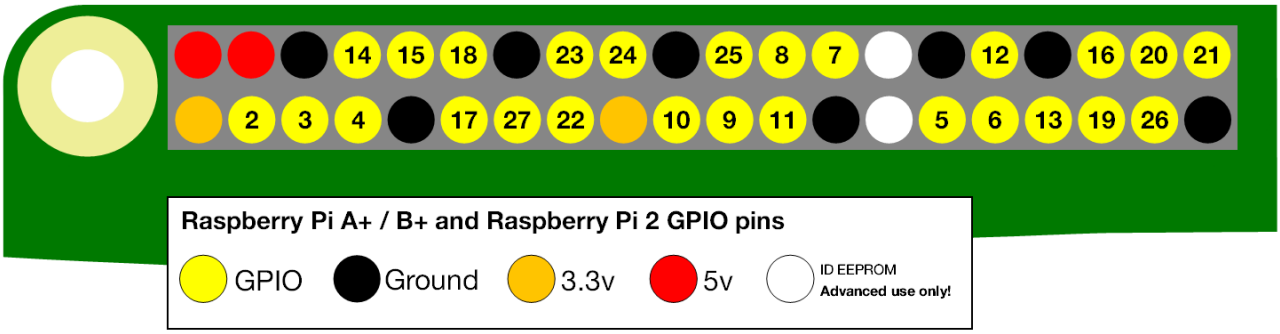
Hardware Electrical Info Cheatsheet

A. Young 11/11/2018

Raspi GPIO:

NOTE: PINS NOT NUMBERED IN ORDER.



- Provides both 3.3v and 5v
- Inputs are 3V3 (CMOS level) - need to drop voltage before taking 5V inputs
- Output max 16mA per pin, total current output not to exceed 51mA

- SPI Interface - SPI0: MOSI (GPIO10); MISO (GPIO9); SCLK (GPIO11); CE0 (GPIO8), CE1 (GPIO7)
- Info about GPIO pin impedance: http://www.thebox.myzen.co.uk/Raspberry/Understanding_Outputs.html
- pinout web app https://pinout.xyz/#

ADC: MCP3008

- 10bit ADC
- 8 channels
- SPI Interface
- Sampling Rate: 200kSPS
- Supply Voltage 2.7V to 5.5V
- Supply Current: 425µA (No need for external Supply)
- 16 pin DIP
- Conversion Time: 10µs
- Alternative part, same family is MCP3004 (less channels, but we only need one)
- Datasheet: https://cdn-shop.adafruit.com/datasheets/MCP3008.pdf

AD8232 Board:

- Supply range 2.0-3.5V
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- Hookup Guide: https://learn.sparkfun.com/tutorials/ad8232-heart-rate-monitor-hookup-guide?_ga=2.126626253.1325472777.1541926096-457725050.1540673738
- Board Homepage: https://www.sparkfun.com/products/12650
- Board Schematic: https://cdn.sparkfun.com/datasheets/Sensors/Biometric/AD8232_Heart_Rate_Monitor_v10.pdf

- Chip Datasheet: https://www.analog.com/media/en/technical-documentation/data-sheets/AD8232.pdf

Connections:

- GND
- 3.3v+
- Output Signal A0 to ADC Input pin CH0
- From page 23 of the datasheet:

DRIVING ANALOG-TO-DIGITAL CONVERTERS

The ability of AD8232 to drive capacitive loads makes it ideal to drive an ADC without the need for an additional buffer. However, depending on the input architecture of the ADC, a simple low-pass RC network may be required to decouple the transients from the switched-capacitor input typical of modern ADCs. This RC network also acts as an additional filter that can help reduce noise and aliasing. Follow the recommended guidelines from the ADC data sheet for the selection of proper R and C values.

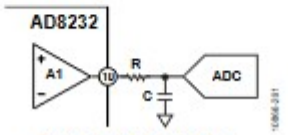
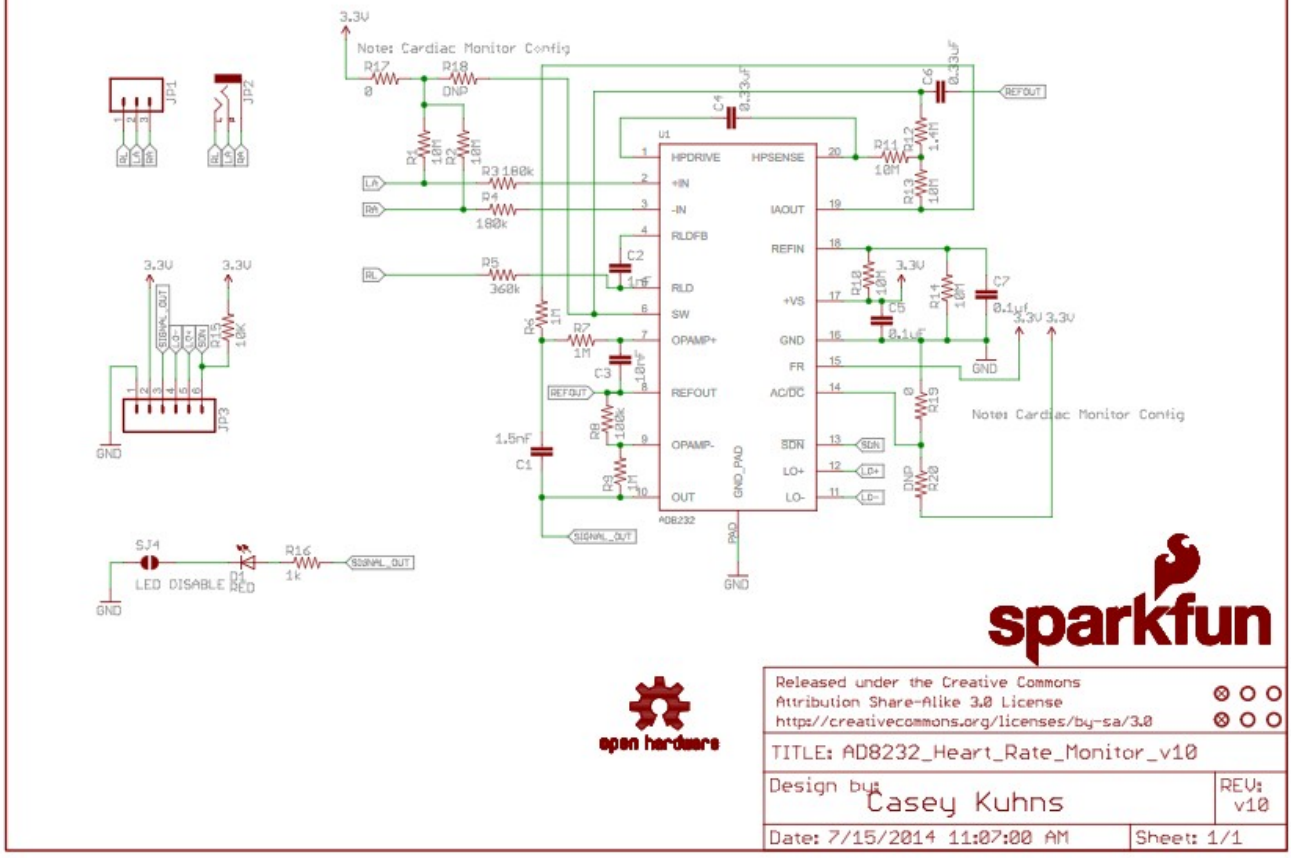


Figure 61. Driving an ADC



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TITLE: AD8232_Heart_Rate_Monitor_v10

Design by: Casey Kuhns

REV: v10

Date: 7/15/2014 11:07:00 AM

Sheet: 1/1