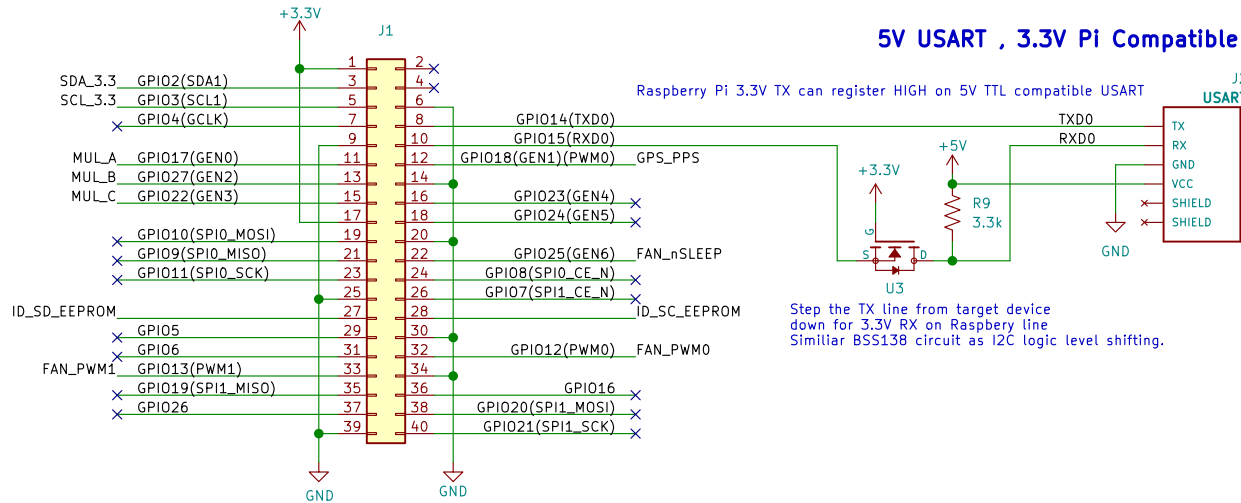
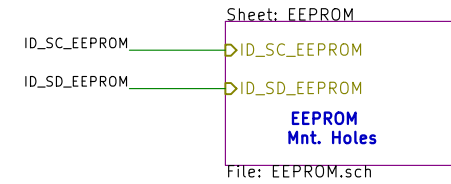


Raspberry Pi Header

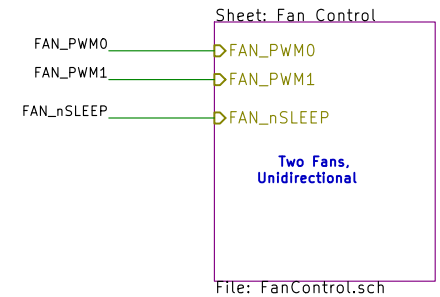
5V USART , 3.3V Pi Compatible



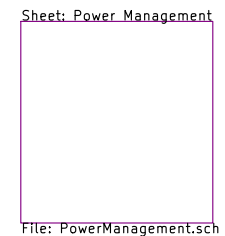
Raspberry Pi HAT Requirements: EEPROM



Fan 1: PWM controlled Fan 2: PWM controlled

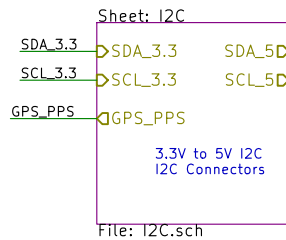


Power Mgmt.

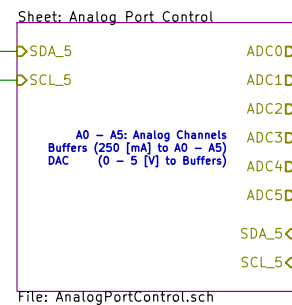


I2C Connectors and I2C Logic Level Conversion

SCL/SDA 5V is on the same I2C bus as 3.3V SCL/SDA

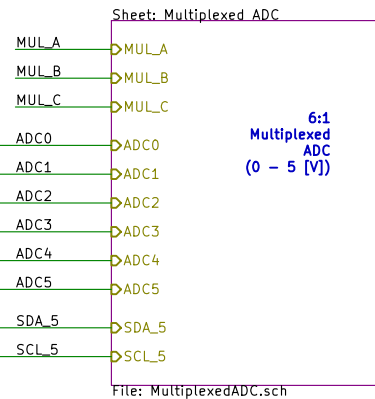


DAC/Buffer power control for Analog Sensors Analog Sensor Ports: A0-A5



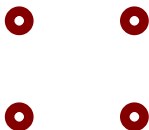
Software Driver:
zephyrus-iaq/Software/HAT/IAQ_DAC43608.py
zephyrus-iaq/Software/HAT/IAQ_AnalogPortController.py

Multiplexed 16-bit ADC



Software Driver:
zephyrus-iaq/Software/HAT/IAQ_Mux.py
zephyrus-iaq/Software/third_party/Adafruit_I2C.py
zephyrus-iaq/Software/third_party/Adafruit_ADS1x15.py

Mounting Holes



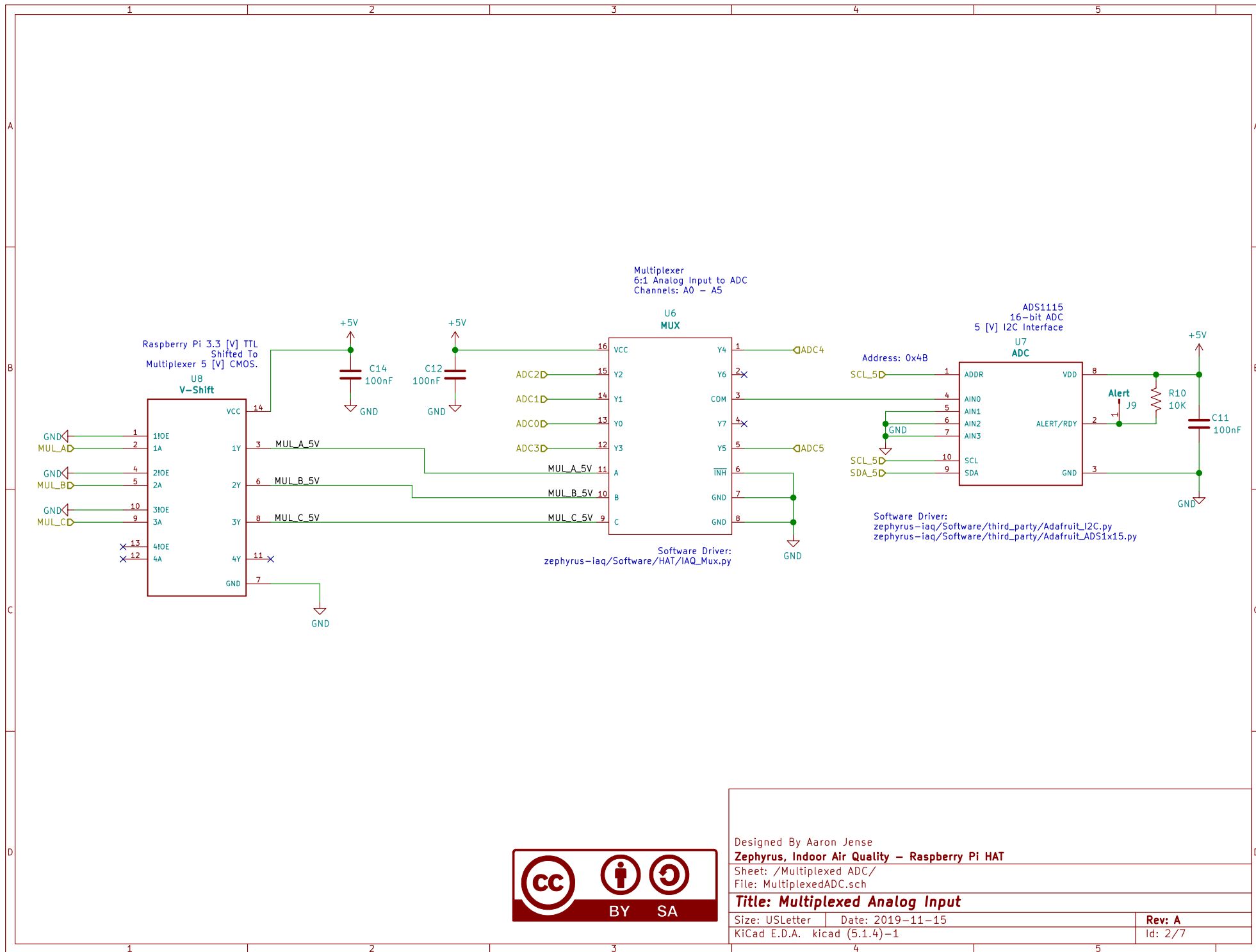
Designed By Aaron Jense
Zephyrus, Indoor Air Quality – Raspberry Pi HAT

Sheet: /
File: Zephyrus-IAQ-HAT.sch

Title: Top Level

Size: USLetter Date: 2019-11-15
KiCad E.D.A. kicad (5.1.4)-1

Rev: A
Id: 1/7



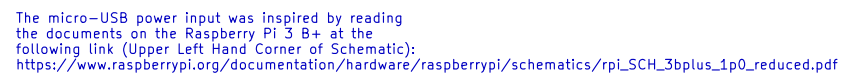
Designed By Aaron Jense
Zephyrus, Indoor Air Quality – Raspberry Pi HAT

Sheet: /Multiplexed ADC/
 File: MultiplexedADC.sch

Title: Multiplexed Analog Input

Size: USLetter | Date: 2019-11-15
 KiCad E.D.A. kicad (5.1.4)-1

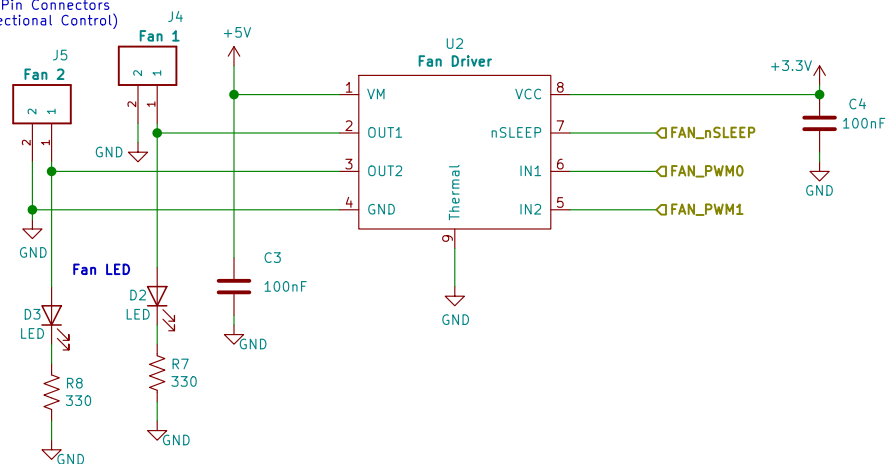
Rev: A
 Id: 2/7



No changes except for the voltage regulator that the micro-USB input feeds into.



Fan 2-Pin Connectors
(Unidirectional Control)



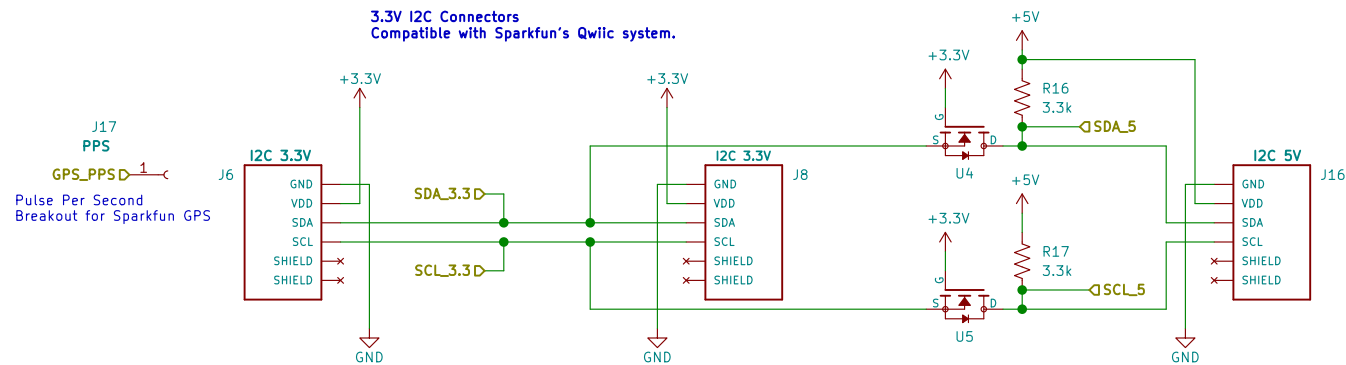
Designed By Aaron Jense
Zephyrus, Indoor Air Quality – Raspberry Pi HAT
 Sheet: /Fan Control/
 File: FanControl.sch

Title: Motor Driver for Fans

Size: USLetter Date: 2019-11-15
 KiCad E.D.A. kicad (5.1.4)-1

Rev: A
 Id: 4/7

3.3V and 5V I2C Connectors



The Bi-Directional logic level shift using the BSS138 was inspired by reading Sparkfun's schematic https://cdn.sparkfun.com/datasheets/BreakoutBoards/Logic_LevelBidirectional.pdf

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Changes:
There is no Pull-Up on the Source, because of the interl Raspberry Pi 1.8k Pull-Ups



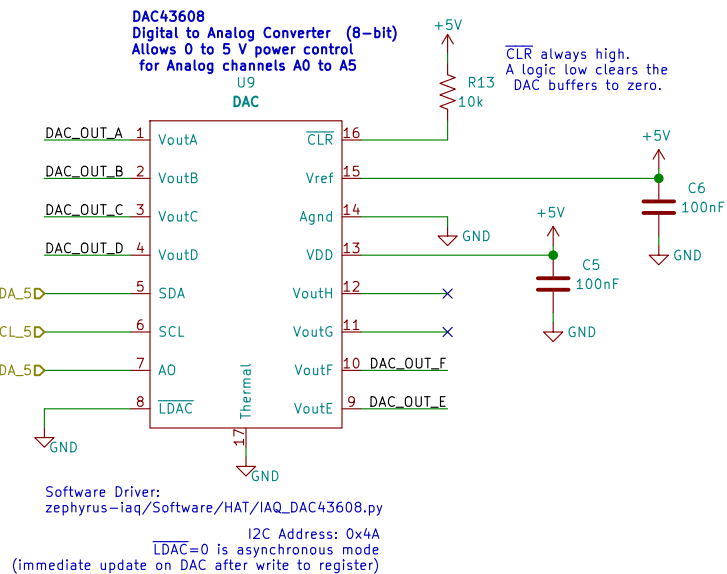
Designed By Aaron Jense
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Sheet: /I2C/
File: I2C.sch

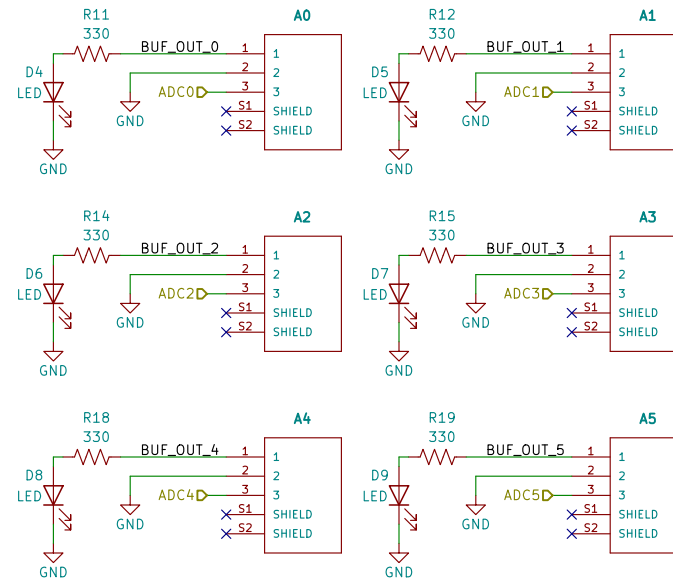
Title: I2C Connectors and Logic Level Conversion

Size: USLetter Date: 2019-11-15
KiCad E.D.A. kicad (5.1.4)-1

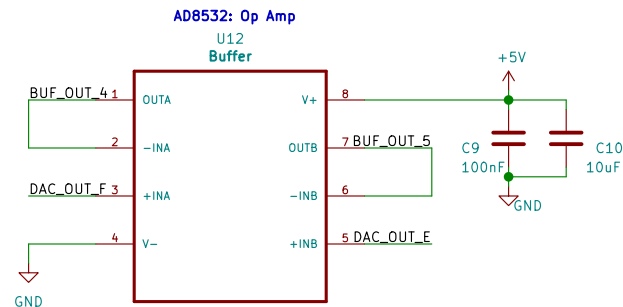
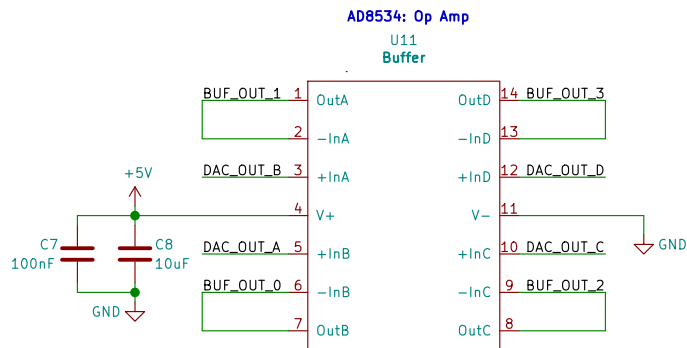
Rev: A
Id: 5/7



Analog Connector Ports [A0 – A5] (MQ Gas Sensors)
0 – 5 [V] from DAC
Up to 250 mA from Buffers



Buffers
Up to 250 mA per channel
Single Supply

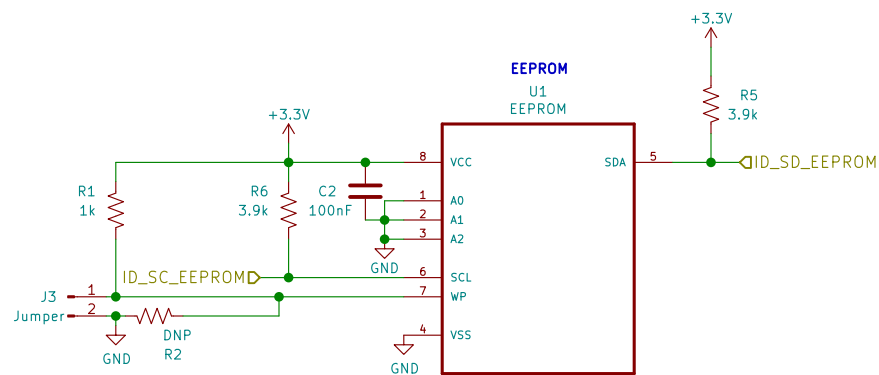


Designed By Aaron Jense
Zephyrus, Indoor Air Quality – Raspberry Pi HAT
Sheet: /Analog Port Control/
File: AnalogPortControl.sch

Title: Analog Port Control [A0–A5]

Size: USLetter Date: 2019–11–15
KiCad E.D.A. kicad (5.1.4)–1

Rev: A
Id: 6/7



At boot time this I2C interface will be interrogated to look for an EEPROM that identifies the attached board and allows automatic setup of the GPIOs (and optionally, Linux drivers).



Designed By Aaron Jense
Zephyrus, Indoor Air Quality – Raspberry Pi HAT
 Sheet: /EEPROM/
 File: EEPROM.sch

Title: Raspberry Pi HAT Specifications

Size: USLetter Date: 2019-11-15
 KiCad E.D.A. kicad (5.1.4)-1

Rev: A
 Id: 7/7