



Digital Receipt

This receipt acknowledges that **Turnitin** received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author: Matthew Stewart
Assignment title: DAH Checkpoint 2
Submission title: DAH Checkpoint 2 Submission
File name: CP2_Submission_Document_Final....
File size: 236.92K
Page count: 3
Word count: 854
Character count: 4,067
Submission date: 15-Oct-2020 07:27PM (UTC+0100)
Submission ID: 134238780

s1739768

DAH Checkpoint 2 Document

1. Explain what all connections to the ADC chip are for (do not simply copy information from the datasheet — explain the practical purpose of these connections).

CH0 []
CH1 []
CH2 []
CH3 []
CH4 []
CH5 []
CH6 []
CH7 []

MCP3208

16 [] V_{DD}
15 [] V_{REF}
14 [] AGND
13 [] CLK
12 [] D_{OUT}
11 [] D_{IN}
10 [] CS/SHDN
9 [] DGND

MCP3208

- Pins 1-8 (CH0-CH7) are 8 individual analogue input channels to read in analogue voltages at a point between a potential divider for example.
- Pin 16 (V_{DD}) is the connection to a power supply between +2.7V to 5.5V to power the ADC
- Pin 15 (V_{REF}) connects with a reference voltage to assign the highest binary output (4095) to, so is important to be accurate and consistent so that the conversions are accurate
- Pin 14 (AGND) is the analogue ground connection, to ground internal analogue circuitry
- Pin 13 (CLK) is the clock pin which synchronises both sides of data being sent and received so the receiver reads the bits when each bit is steady and valid
- Pin 12 (D_{OUT}) is the SPI serial data output pin and delivers the converted data bits serially
- Pin 11 (D_{IN}) is the SPI serial data input pin where instructions are received
- Pin 10 (CS/SHDN) is the chip select/shutdown pin and when it is set high, makes all other pins ignore changes sent to them allowing them to remain connected but not be in use, allows device to left in 'standby' mode which saves energy
- Pin 9 (DGND) is the digital ground connection, to ground internal digital circuitry, separate circuitry for analogue and digital to make sure they don't interfere

2. Explain the meaning of the return values of each Python method for the ADC.

- ADC0.analogCount () returns the number of analogue channels (8 for MCP3208)
- ADC0.analogResolution () returns the analogue resolution/bit count (12 for MCP3208)
- ADC0.analogMaximum () returns the maximum analogue integer value for converting a voltage input to binary number based on reference voltage (4095 for MCP3208)
- ADC0.analogReference () returns the voltage corresponding to the maximum analogue integer (reference voltage)
- ADC0.analogRead (channel) returns the integer value of the given analogue channel as converted from the voltage (see next question)
- ADC0.analogReadFloat (channel) returns the float value of the given analogue channel (the integer value over the maximum 4095)
- ADC0.analogReadVolt (channel) returns the voltage value of the given analogue
- ADC0.analogReadAll () returns a list of all channels' integer values

