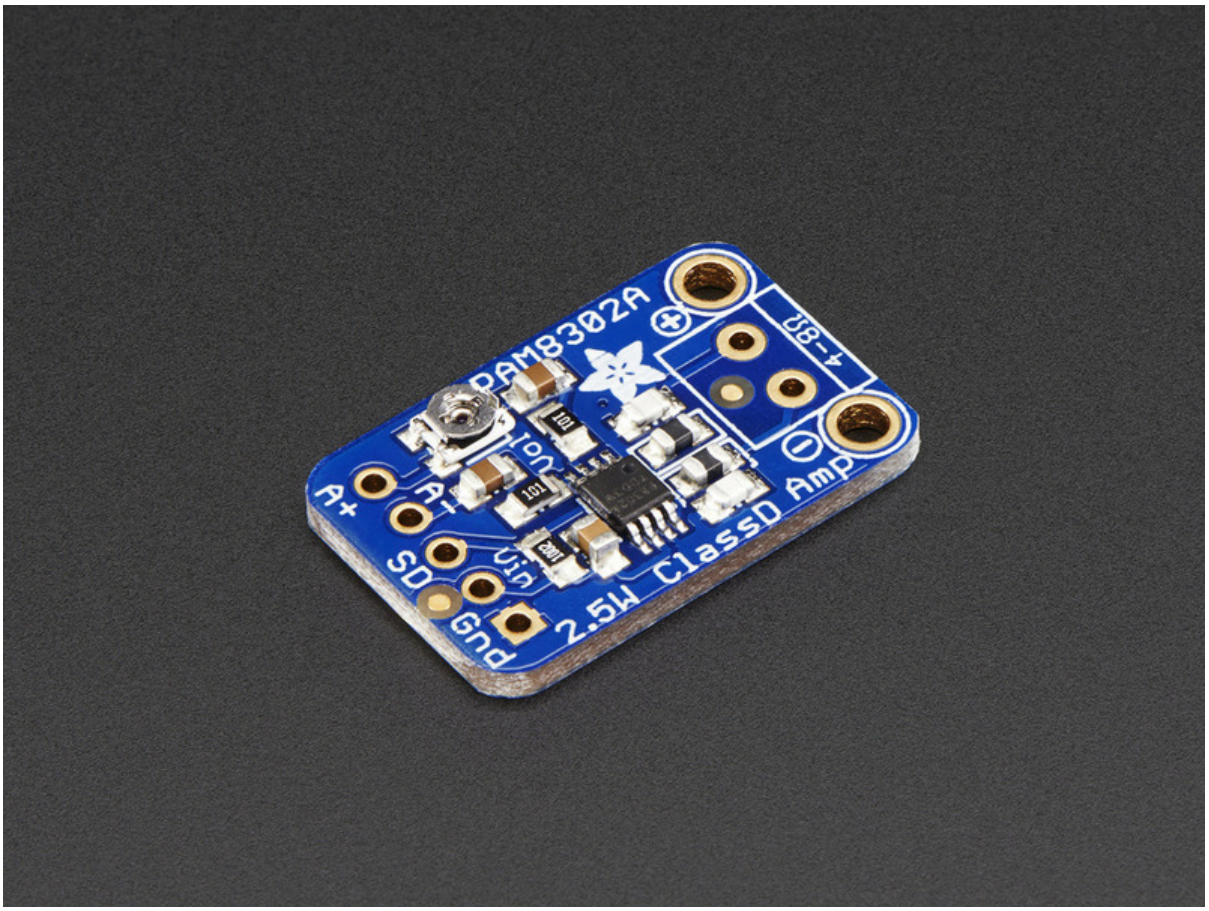
Adafruit PAM8302 - Mono 2.5W Class D Audio Amplifier

Created by Liz Clark



https://learn.adafruit.com/adafruit-pam8302-mono-2-5w-class-d-audio-amplifier

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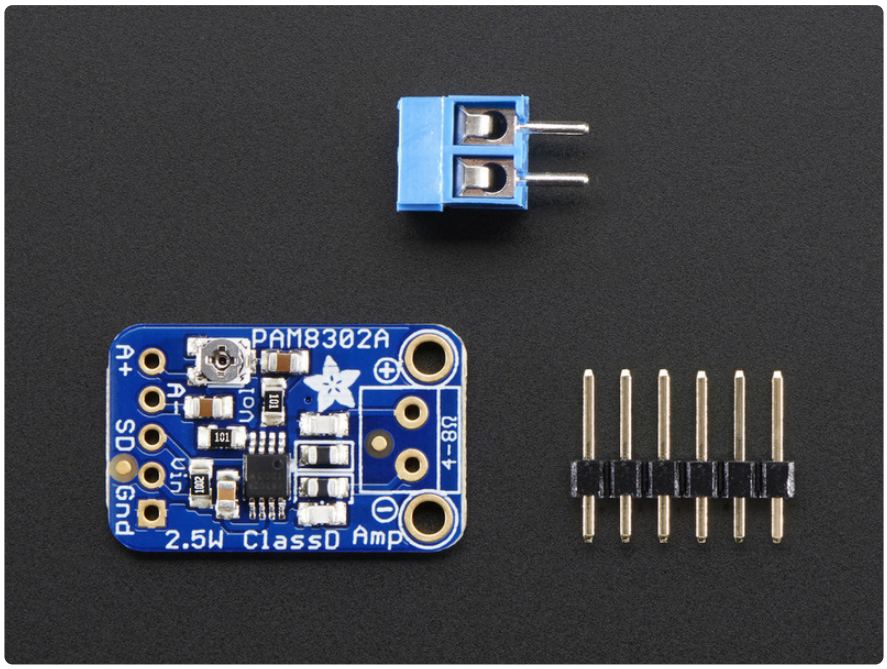
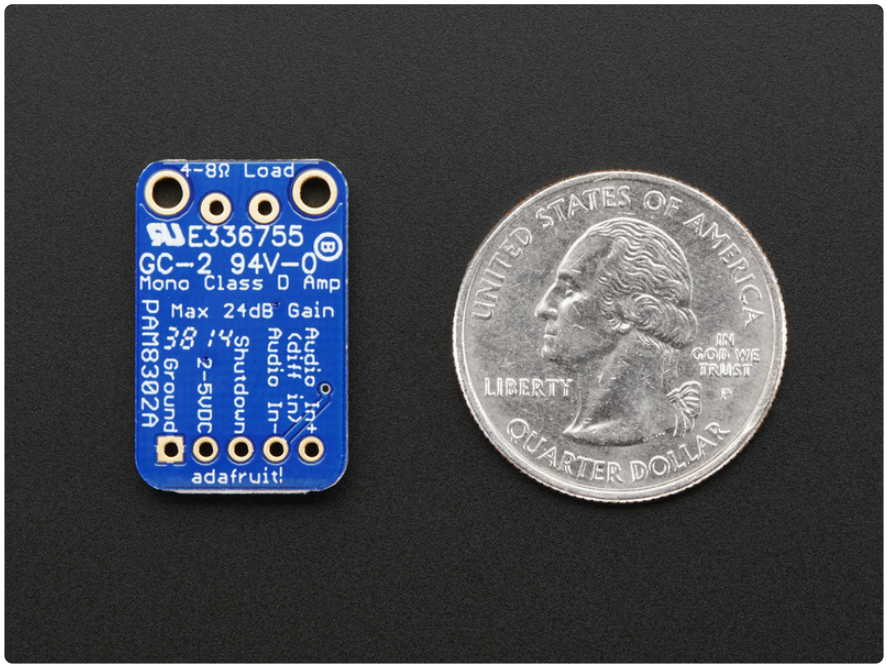
Table of Contents

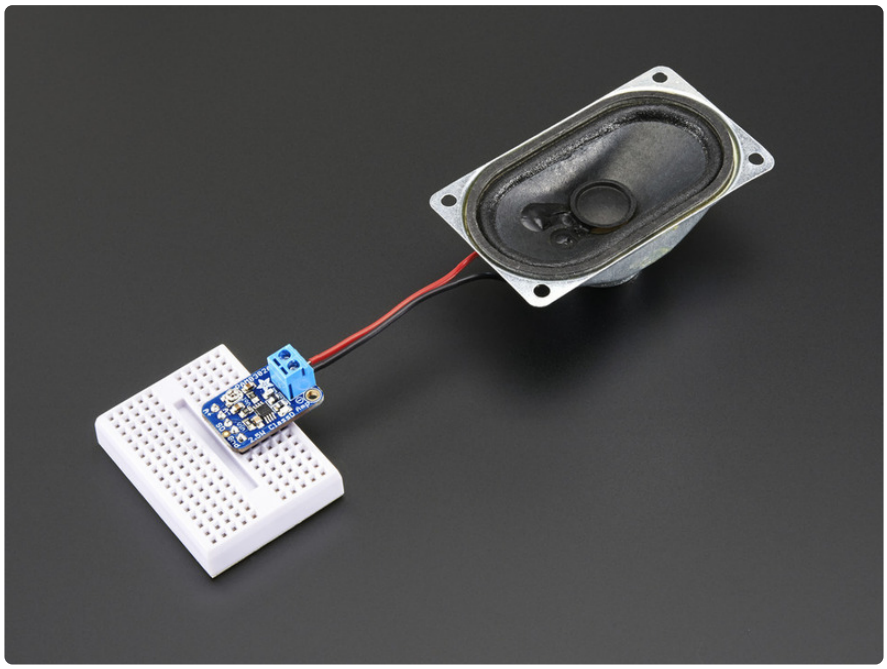
Overview



This super small mono amplifier is surprisingly powerful - able to deliver up to 2.5 Watts into 4-8 ohm impedance speakers. Inside the miniature chip is a class D controller, able to run from 2.0V-5.5VDC. Since the amp is a class D, its very efficient (over 90% efficient when driving an 8Ω speaker at over half a Watt) - making it perfect for portable and battery-powered projects. It has built in thermal and over-current protection but we could barely tell it got hot. There's even a volume trim pot so you can adjust the volume on the board down from the default 24dB gain. This board is a welcome upgrade to basic "LM386" amps!



The A+ and A- inputs of the amplifier go through 1.0uF capacitors, so they are fully 'differential' - if you don't have differential outputs, simply tie the Audio- pin to ground. The output is "Bridge Tied" - that means the output pins connect directly to the speaker pins, no connection to ground. The output is a high frequency 250KHz square wave PWM that is then 'averaged out' by the speaker coil - the high frequencies are not heard. All the above means that you can't connect the output into another amplifier, it should drive the speakers directly.

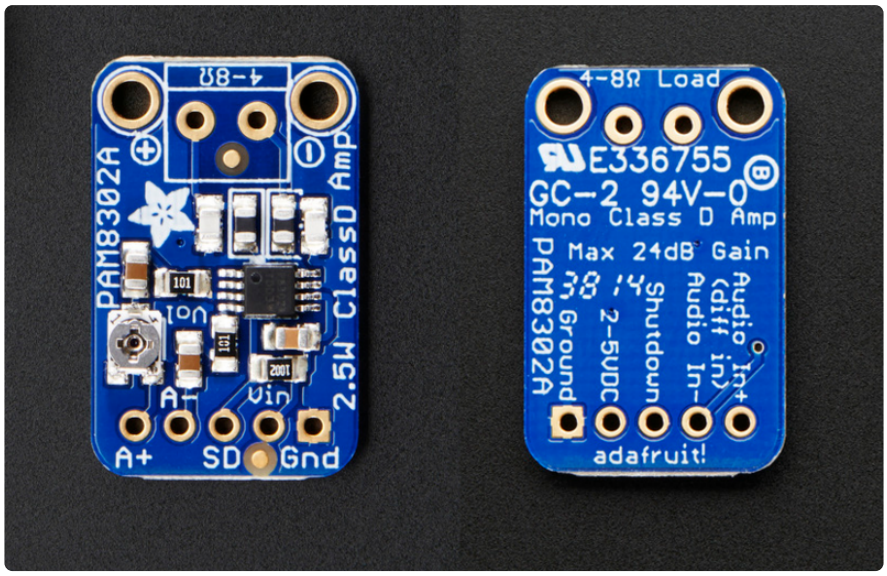


Comes with a fully assembled and tested breakout board. We also include header to plug it into a breadboard and a 3.5mm screw-terminal blocks so you can easily attach/detach your speaker. You will be ready to rock in 15 minutes! **Speaker is not included, use any 4 ohm or greater impedance speaker.**

- Output Power: 2.5W at 4Ω, 10% THD, 1.5W at 8Ω, 10% THD, with 5.5V Supply
- 50dB PSRR at 1KHz
- Filterless design, with ferrite bead + capacitors on output.
- Fixed 24dB gain, onboard trim potentiometer for adjusting input volume.
- Thermal and short-circuit/over-current protection
- Low current draw: 4mA quiescent and 0.5mA in shutdown (due to pullup resistor on SD pin)

Note: The terminal block included with your product may be blue or black.

Pinouts



This board is an audio amplifier and as a result, does not require code to work. It accepts an audio signal and outputs it to a speaker.

Power Pins

- **VIN** - This is the power pin. To power the board, give it 2.0V-5.5VDC.
- **GND** - This is common ground for power.

Input Pins

- **A+** and **A-** - Audio inputs for the amplifier. Signal goes through 1.0uF capacitors, so they are fully 'differential'. If you don't have differential outputs, simply tie the **A-** to ground.

Shutdown Pin

- **SD** - The shutdown pin. Can be used to power down the amplifier by tying to ground.

Output Pins

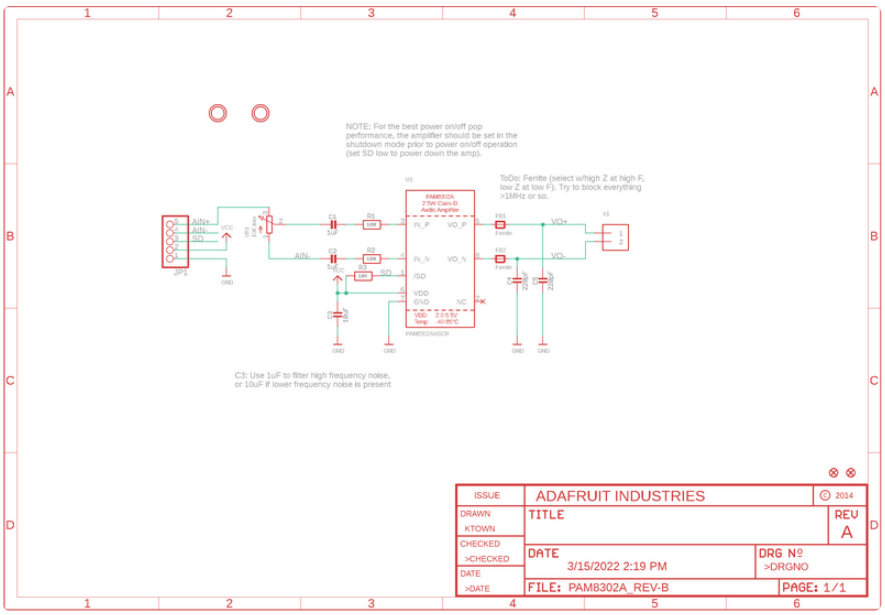
- + and - - Amplifier output pins. They are spaced to allow for a terminal block to be soldered in place. The output is "Bridge Tied" so that the output connects directly to the speaker pins, no connection to ground.

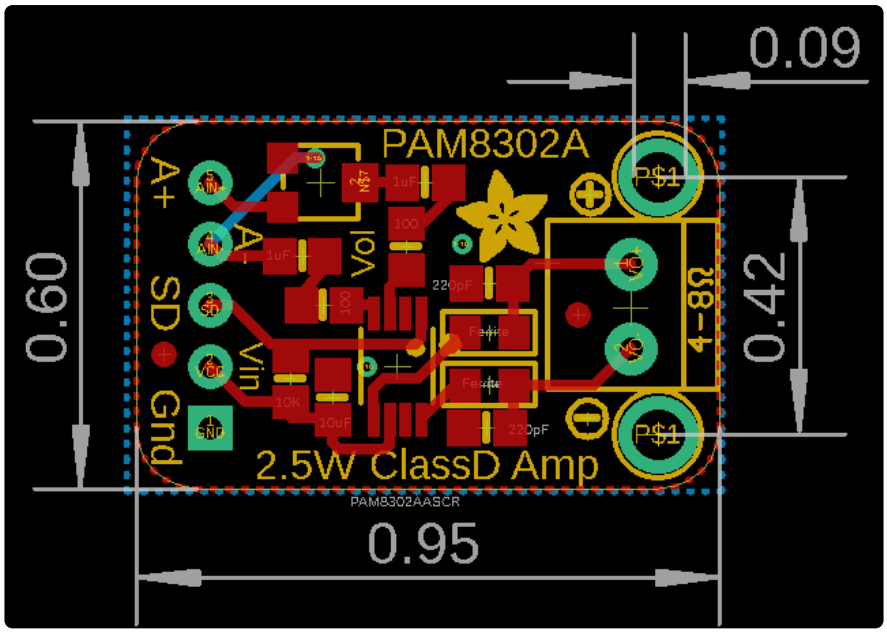
Downloads

Files

- PAM8302 Datasheet (https://adafru.it/FYC)
- EagleCAD PCB files on GitHub (https://adafru.it/-yB)
- Fritzing object in the Adafruit Fritzing Library (https://adafru.it/-yC)

Schematic and Fab Print




0.09
PAM8302A
A+
A-
SD
Gnd
Vin
Vol
P$1
4-8Ω
0.42
0.60
2.5W ClassD Amp
PAM8302AASCR
0.95