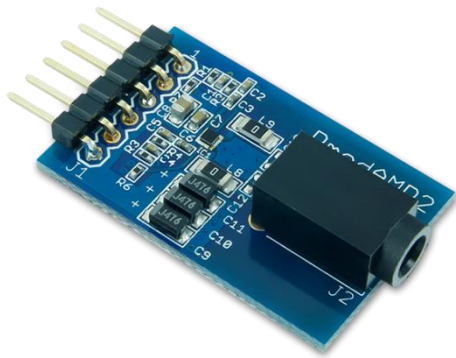# PmodAMP2™ Reference Manual

Revised April 15, 2016
This manual applies to the PmodAMP2 rev. A

Overview

The Digilent PmodAMP2 amplifies low power audio signals to drive a monophonic output. This module offers a digital gain select to allow output at a 6 or 12 dB gain with pop-and-click suppression.

The PmodAMP2.

Features include:

- Filterless, high efficiency audio amplifier
- Monophonic audio output
- Standard 1/8" (0.32 cm) mono speaker jack
- Micropower shutdown mode
- Pop–and-click suppression
- Digital gain select
- Small PCB size for flexible design at 1.25" × 0.8" (3.2 cm × 2.0 cm)
- 6-pin Pmod port with GPIO interface
- Follows Digilent Pmod Interface Specification Type 1

1 Functional Description

The PmodAMP2 utilizes Analog Devices SSM2377 Mono Class-D audio amplifier. This module is designed to accept an analog voltage signal as the incoming audio input, although a pulse-width modulated signal can also be easy accepted after it passes through the reconstruction filter. A Σ-Δ modulator internal to the SSM2377 nicely smoothes out the incoming analog signal to get a clean audio output signal.

2 Interfacing with the Pmod

The PmodAMP2 communicates with the host board via the GPIO protocol. What this entails for us is that there is not a timing protocol that we need to follow. Rather, as long as your incoming digital data has a sample rate of at least 16 kHz, the amplifier will be able to nicely handle the incoming data. Alternatively, an analog signal can be provided and will also result in a corresponding sound output.

A gain selection pin and active-low shutdown pins are also available for use. When the gain pin is driven high there is a 6 dB gain applied to the incoming audio signals and a 12 dB gain applied to audio signals when the pin is driven low.

The shutdown pin can be driven to a logic low level to place the SSM2377 into a very low power state with a shutdown current of only 100 nA placing very little strain on the power source. The Pmod can be brought back into normal operation mode by bringing the shutdown pin back to a logic high level for a maximum speaker output of 2.5W.

Pin	Signal	Description
1	AIN	Audio Input
2	GAIN	Gain Selection
3	NC	Not Connected
4	~SHUTDOWN	Active Low Shutdown
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V/5V)

Table 1. Connector J1: Pin descriptions as labeled on the Pmod.

Any external power applied to the PmodAMP2 must be within 2.5V and 5.5V; however, it is recommended that Pmod is operated at 3.3V.

3   Physical Dimensions

The pins on the pin header are spaced 100 mil apart. The PCB is 1.25 inches long on the sides parallel to the pins on the pin header and 0.8 inches long on the sides perpendicular to the pin header.

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