

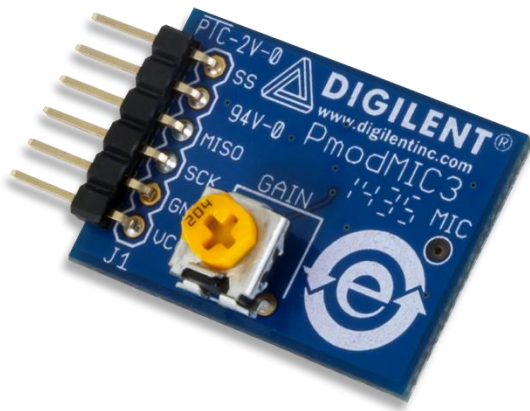
PmodMIC3™ Reference Manual

Revised April 12, 2016

This manual applies to the PmodMIC3 rev. A

Overview

The PmodMIC3 is a MEMS Microphone powered by the Knowles Acoustics [SPA2410LR5H-B](#) and the Texas Instruments [ADCS7476](#). Users may adjust the incoming volume to the system board with the small potentiometer before they receive the 12 bits of data through SPI.



The PmodMIC3.

Features include:

- MEMS Microphone module with digital interface
- Transform audio inputs with 12-bit A/D converter
- Adjust incoming volume with on-board potentiometer
- up to 1 MSPS of data
- Small PCB size for flexible designs 1.1 in × 0.8 in (2.8 cm × 2.0 cm)
- 6-pin Pmod port with SPI interface
- Follows Digiilent Pmod Interface Specification Type 2

1 Functional Description

The PmodMIC3 is designed to digitally report to the host board whenever it detects any external noise. By sending a 12-bit digital value representative of frequency and volume of the noise, this number can be processed by the system board and have the received sound accurately reproduced through a speaker. The on-board potentiometer can be used to modify the gain from the microphone into the ADC.

2 Interfacing with the Pmod

The PmodMIC3 communicates with the host board via the SPI protocol. The 12 bits of digital data are sent to the system board in 16 clock cycles with the most significant bit first. For the ADC7476, each bit is shifted out on each falling edge of the serial clock line after the chip select line is brought low with the first four bits as leading zeroes and the remaining 12 bits representing the 12 bits of data. The datasheet for the ADC7476 recommends that for faster microcontrollers or DSPs, the serial clock line is first brought to a high state before being brought low after the fall of the chip select line to ensure that the first bit is valid. More information about this can be found in the PmodMIC3 User Guide.

| Pin | Signal | Description |
|-----|--------|------------------------|
| 1 | SS | Chip select |
| 2 | NC | Not connected |
| 3 | MISO | Master-in slave-out |
| 4 | SCK | Serial clock |
| 5 | GND | Power supply ground |
| 6 | VCC | Power supply (3.3V/5V) |

Table 1. Pinout table diagram.

The PmodMIC3 is capable of converting up to 1 MSa per second of 12-bit data, making it an ideal Pmod to use in conjunction with the PmodI2S for an audio development application.

Any external power applied to the PmodMIC3 must be within 3V and 5.5V to ensure that the on-board chips operate correctly; however, it is recommended that Pmod is operated at 3.3V.

A sample timing diagram taken from the ADCS7476 datasheet representing the data that will be received by the system board from the Pmod is shown in Fig. 1.

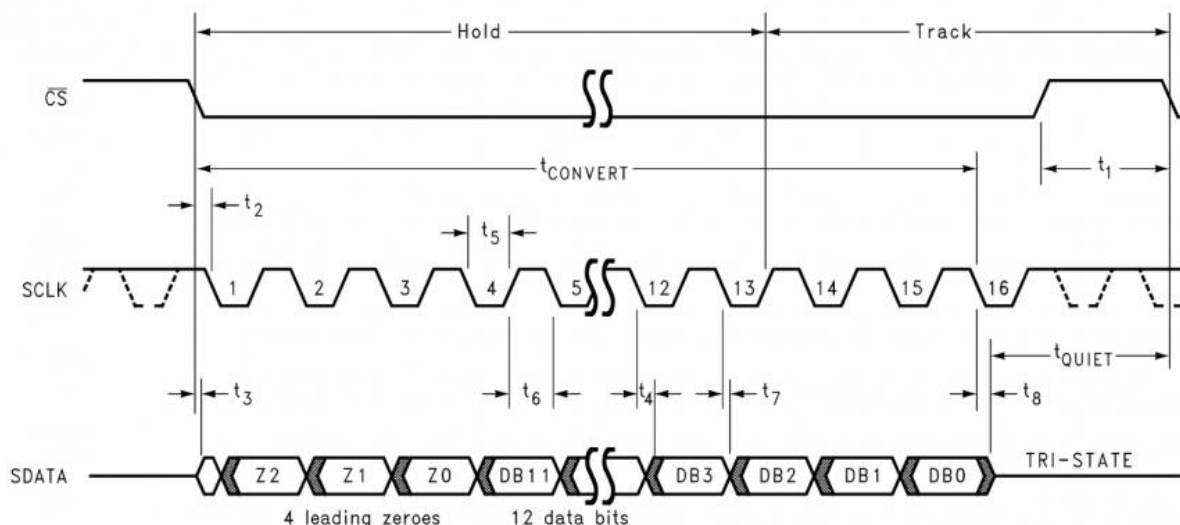


Figure 1. Timing diagram.

3 Physical Dimensions

The pins on the pin header are spaced 100 mil apart. The PCB is 1.1 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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