

# X-Powers AC107

## 2-Channel ADC with TDM Output for Multiple-MIC Devices



Revision 1.0

## Overview

The AC107 is a highly integrated 2-channel ADC with I2S/TDM output transition . It's designed for multi-microphone array in high definition voice capture and recognition application platforms.

The AC107 integrates two synchronized ADCs with independent programmable mic bias voltage and mic boost amplifier to deliver valid channel data that channel crosstalk can be eliminated. The analog input port MIC1P/N ~MIC2P/N is designed as two differential microphone pin or single-ended line-in pin. Two smart digital mic interfaces are supported to make low jitter clock output and decimation filter for up to two digital mic. Independent digital voice controllers are provided in each channel .

The integrated digital PLL supports a large range of input/output frequencies, and It can generate required system clocks from common reference clock frequencies such as 6-/12-MHz, 6.144-/12.288-MHz, 5.6448-/11.2896-MHz, 13MHz and 19.2MHz. The audio sample 8kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz, 96kHz is supported.

The AC107 can transit its 2 channels output data over the I2S port by standard I2S or PCM format. Also, one to eight device can be combined to transit up to 16 channels output data by a single TDM line. Furthermore, A new format called encoding mode can be used to transit 16 channels data when the I2S format of AP is normal protocol types.

The device includes several digital control such as high-pass filters, mixers and volume control.

AC107 is controlled through TWI interface (2-wire serial interface ) . It works only in slave mode .

The device is available in 20-pin 3x3 and 24-pin 4x4 QFN package

## Feature

### ■ ADC feature

- 103 dB dynamic range (A-weighted) @ 0 dB boost gain
- - 85 dB THD+N @ 0 dB boost gain
- 2 programmable boost amplifiers with 0dB to 30dB in 1dB step
- ADC sample rates supported: 8kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz , 96kHz
- Analog mixer and digital mixer in record data path

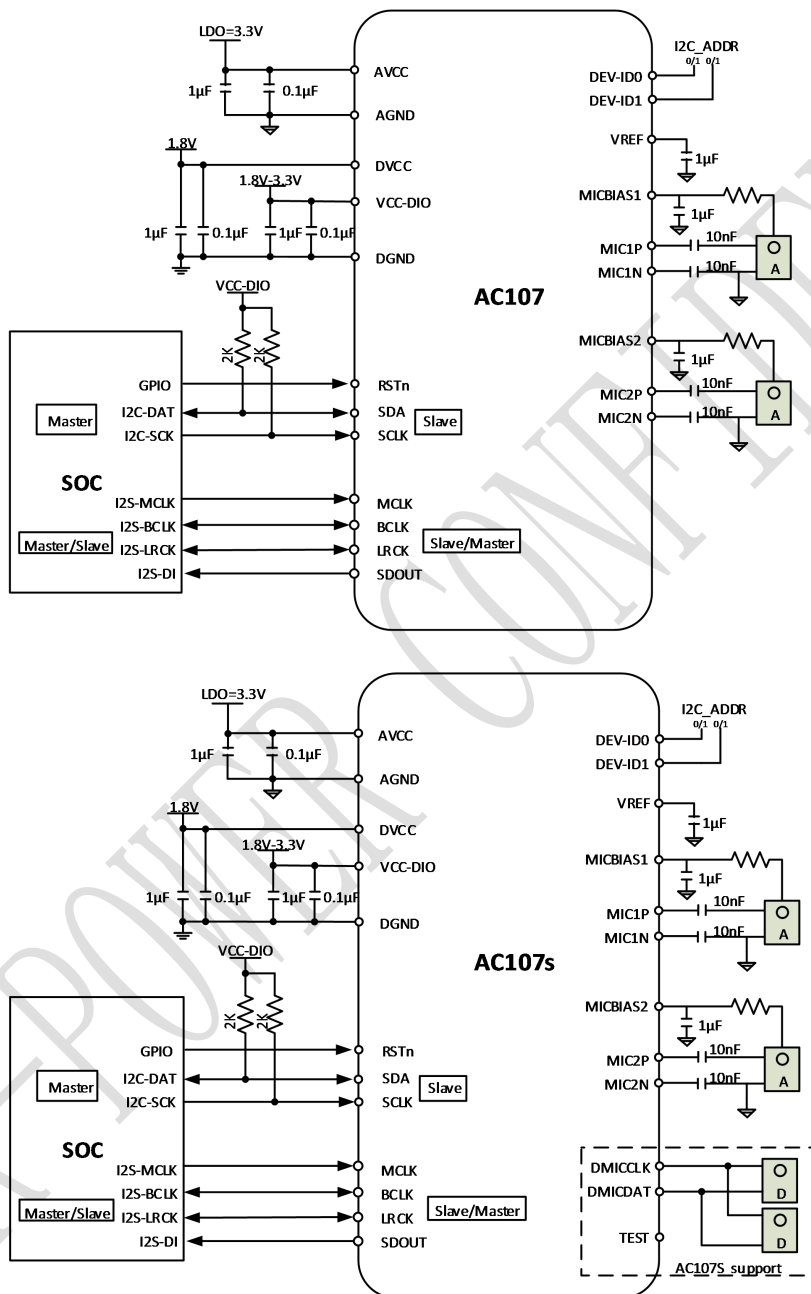
### ■ Analog Input and output

- Two fully differential microphone inputs: MIC1P/N ~MIC2P/N
  - Can be configured as pseudo differential, single-ended mode
  - Can be configured as digital MIC data pin
- Two low noise mic bias outputs: MIC1\_BIAS~MIC2\_BIAS
  - Programmable bias voltage 1.8V to 3.0V
  - 4uV noise level in signal bandwidth

## ■ Digital In/Out

- One digital microphone SCLK output@1M~3M
- One I2S data output transmits even 16 channel of 8 devices
- One PDM output transmits internal 2-channel data, especially for echo cancellation paths
- TWI control interface support up to 400 kHz
- AC107 for QFN20-pin 3x3 and AC107s for QFN24-pin 4x4 package

## Typical Application Diagram



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