

# AD1984A SoundMAX HD Audio Codec With 4 DACs, 4 ADCs, SPDIF Out

#### **Features**

- 2 stereo headphone amplifiers
- Line outputs and inputs
- Analog microphone inputs
- Retaskable ports
- 192 kHz DACs/ADCs
  - 2 independent stereo DAC/ADC
  - pairs
    Simultaneous record of 2 stereo channels
  - Simultaneous playback of 2 stereo channels
  - All independent sample rates, 8 kHz through 192 kHz
  - 16-, 20-, and 24-bit resolution
  - Selectable stereo mixer on outputs
- Stereo Digital Microphone Interface
- Two 192 kHz digital microphone channels
- Supports 1 or 2 microphones per nig
- Selectable bit clock rates of 1.5 MHz, 2.0 MHz, and 3.0 MHz
- Mono and stereo array support
- All sample rates, 8 kHz through 192 kHż
- 16-, 20-, and 24-bit resolution Digital PCM gain control
- S/PDIF Output
  - Supports 44.1 Hz through 192 kHz sample rates
  - 16-, 20-, and 24-bit data; PCM and AC3 formats
  - Digital PCM gain control Auxiliary Pins
- Impedance and presence detection on all jacks
- Full analog mixer with DAC inputs
- 3 independent microphone bias pins
- Digital and analog PCBeep
- 3 general-purpose digital I/O (GPIO) pins
- 3.3 V analog supply voltage 1.7 V to 1.9 V or 3.3 V digital supply
- 1.5 V or 3.3 V HD Audio link signaling voltage
- Advanced power management modes
- Security feature prevents unauthorized recording
- 48-lead, RoHS compliant QFN package

#### Software

- Voice input enhancements
- Output enhancements

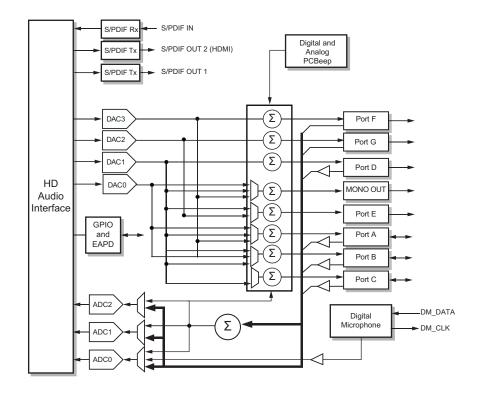
### **Applications**

- **Embedded Audio**
- Point Of Sale Systems

#### Overview

The AD1984A audio codec and software provide superior high definition audio quality and performance. The AD1984A has two 192 kHz DAC pairs, two 192 kHz ADC pairs, an S/PDIF output, a 2-channel digital microphone interface, and digital and analog PCBeep. These features make the AD1984A the right choice for embedded systems where performance is key. The AD1984A is available in a 48-lead, RoHS compliant lead frame chip scale package in both reels and trays.

### **Block Diagram**



#### Part Number AD1984A

**Description** SoundMAX HD Audio Codec

### Table 1. Performance Characteristics

Parameter	Min	Тур	Max	Unit
Line-Out Drive (10 $k\Omega$ loads—DAC to Pin) Total Harmonic Distortion (THD + N) Dynamic Range ( $-60$ dB in ref to $f_S$ A-Weighted) Signal-to-Noise Ratio		-86 101 101		dB dB dB
Headphone Drive (32 $\Omega$ loads—DAC to Pin)  Total Harmonic Distortion (THD + N)  Dynamic Range ( $-60$ dB in ref to f <sub>S</sub> A-Weighted)  Signal-to-Noise Ratio		-84 101 101		dB dB dB
Input Ports (Mic Boost = 0 dB) Total Harmonic Distortion (THD + N) Dynamic Range (–60 dB in ref to f <sub>S</sub> A-Weighted) Signal-to-Noise Ratio		-80 92 92		dB dB dB

### Table 2. Specifications

Parameter	Min	Тур	Max	Unit
Analog-to-Digital Converte	ers			
Resolution		24		Bits
Gain Error (Full-Scale Span Relative to Nominal Input Voltage)			±10	%
Interchannel Gain Mismatch (Difference of Gain Errors)		±0.2	±0.5	dB
ADC Offset Error			±5	mV
ADC Crosstalk				
Line Inputs (Input L, Ground R, Read R; Input R, Ground L, Read L)		-94		dB
Line Inputs to Other		-100	-80	dB
Digital-to-Analog Converte	ers	<b>-</b>	•	
Resolution		24		Bits
Gain Error (Full-Scale Span Relative to Nominal Input Voltage)			±10	%
Interchannel Gain Mismatch (Difference of Gain Errors)			±0.5	dB
DAC Crosstalk (Input L, Zero R, Measure R_OUT; Input R, Zero L, Measure L_OUT)		-104		dB
Analog Mixer	<u>'</u>	<u></u>	l .	
Signal-to-Noise Reduction (SNR) Input to Output		95		dB
Step Size: All Mixer Inputs		1.5		dB
Input Gain/Attenuation Range: All Mixer Inputs			+12.0	dB

## **Ordering Information**

Device Set Order ID	Package Type	Package	Operating Temperature		
AD1984AJCPZ*	QFN	48-Lead QFN, 7x7 mm	0°C to 70°C		
*Lead-free (Pb Free) and RoHS compliant					

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