

### FEATURES

- 5 V multichannel audio system
- Accepts 16-/18-/20-/24-bit data
- Supports 24-bit and 96 kHz sample rate
- Multibit  $\Sigma$ - $\Delta$  modulators with data directed scrambling
- Differential output for optimum performance
- ADCs: -92 dB THD + N, 105 dB SNR and dynamic range
- DACs: -95 dB THD + N, 108 dB SNR and dynamic range
- On-chip volume control with "auto-ramp" function
- Programmable gain amplifier for ADC input
- Hardware and software controllable clickless mute
- Digital de-emphasis processing
- Supports  $256 \times f_s$ ,  $512 \times f_s$ , or  $768 \times f_s$  master clock
- Power-down mode plus soft power-down mode
- Flexible serial data port with right justified, left justified, I<sup>2</sup>S compatible, and DSP serial port modes
- TDM interface mode supports 8 in/8 out using a single SHARC<sup>®</sup> SPORT
- 52-lead MQFP (PQFP) plastic package

### APPLICATIONS

- Home theater systems
- Automotive audio systems
- DVD recorders
- Set-top boxes
- Digital audio effects processors

### PRODUCT OVERVIEW

The AD1836A is a high performance, single-chip codec that provides three stereo DACs and two stereo ADCs using ADI's patented multibit  $\Sigma$ - $\Delta$  architecture. An SPI<sup>®</sup> port is included, allowing a microcontroller to adjust volume and many other parameters. The AD1836A operates from a 5 V supply, with provision for a separate output supply to interface with low voltage external circuitry. The AD1836A is available in a 52-lead MQFP (PQFP) package.

### FUNCTIONAL BLOCK DIAGRAM

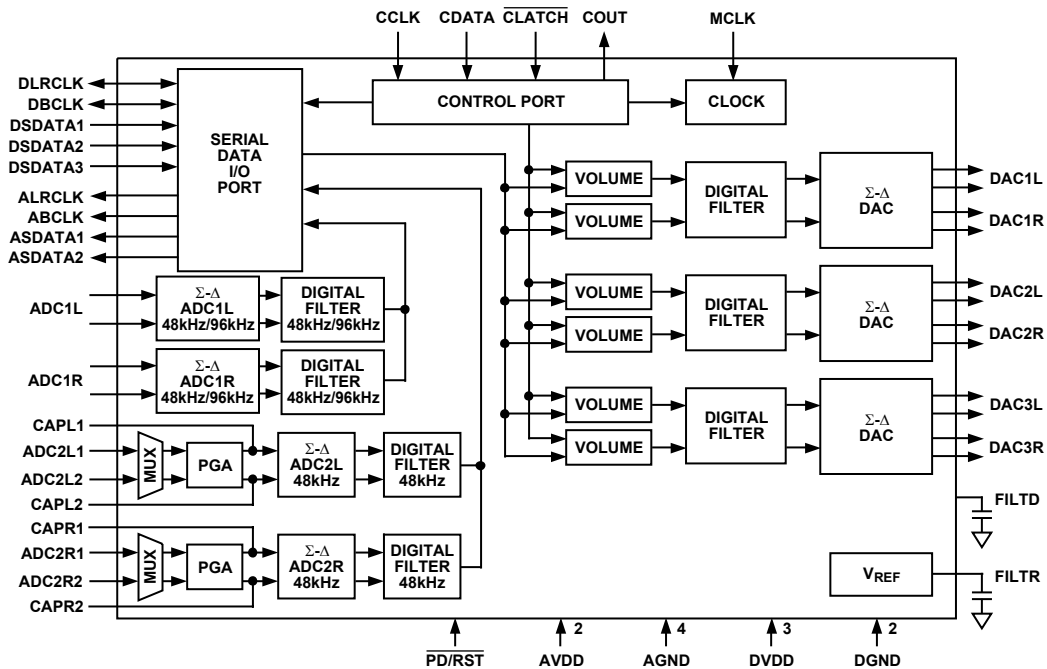


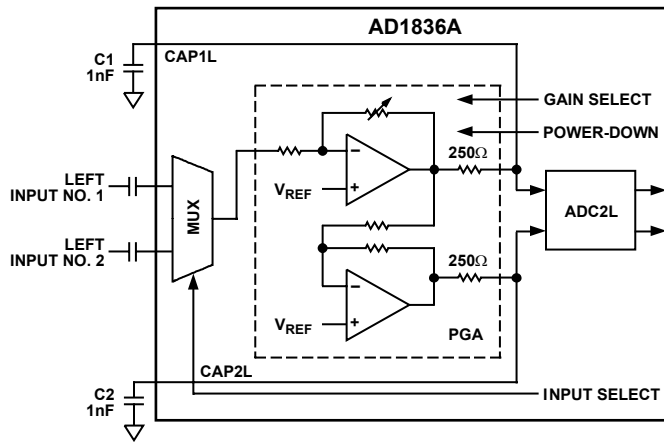
Figure 1.

### Rev. 0

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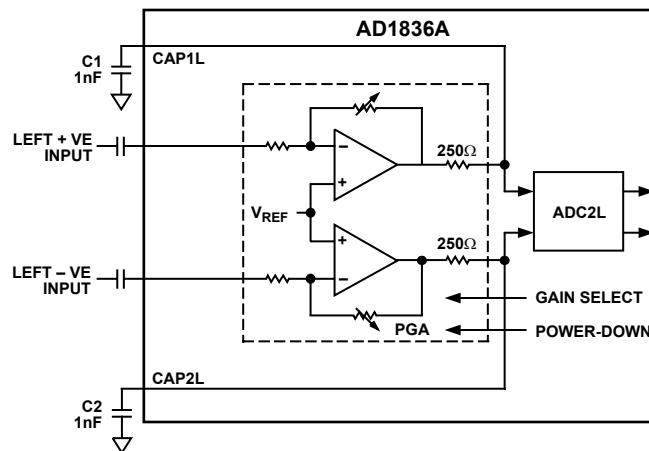
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# AD1836A



NOTE  
 ADC2 SINGLE-ENDED MUX PGA INPUT MODE—LEFT CHANNEL ONLY SHOWN.  
 CONTROL REGISTER 3 CONTENTS: 6 LSBs: SELECT INPUT NO. 1: 11 1010  
 SELECT INPUT NO. 2: 11 1111

Figure 13. Single-Ended MUX/PGA Mode



NOTE  
 ADC2 DIFFERENTIAL PGA INPUT MODE—LEFT CHANNEL ONLY SHOWN.  
 CONTROL REGISTER 3 CONTENTS: 6 LSBs: 00 1010

Figure 14. Differential PGA Mode

## OUTLINE DIMENSIONS

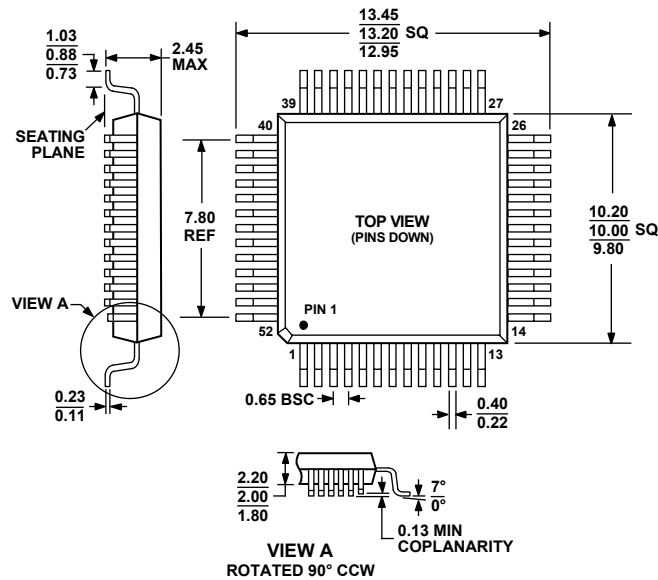


Figure 15. 52-Lead Plastic Quad Flat Package [MQFP]  
(S-52A)  
Dimensions shown in millimeters

### ESD CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although this product features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



### ORDERING GUIDE

AD1836A Products	Temperature Package	Package Description	Package Option
AD1836AAS	-40°C to +85°C Ambient	52-Lead MQFP	S-52A
AD1836AASRL	-40°C to +85°C Ambient	52-Lead MQFP	S-52A on 13" Reels
AD1836ACS	-40°C to +85°C Ambient	52-Lead MQFP	S-52A
AD1836ACSRL	-40°C to +85°C Ambient	52-Lead MQFP	S-52A on 13" Reels
EVAL-AD1836AEB		Evaluation Board	

**AD1836A**

**NOTES**