

**24 bit, 96 kHz Stereo A/D Converter**

**Features**

- 24-bit I<sup>2</sup>S audio data format output
- Single power supply 3.3 V for analog and digital
- Single-ended analog input with internal anti-alias filter
- SNR: 98 dB (A-weighted)
- DR: 99 dB (A-weighted)
- THD: -91 dB
- Master/slave mode selection
- Multiple sampling frequencies (F<sub>S</sub>): 8~96 kHz
- System clock: 128 F<sub>S</sub>, 256 F<sub>S</sub>, 384 F<sub>S</sub>, 512 F<sub>S</sub>
- Power down function
- Internal PLL
- 16-pin TSSOP package

input signals into 24-bit I<sup>2</sup>S digital audio data through on-chip anti-aliasing filter, multi-bit  $\Sigma$ - $\Delta$  modulator, decimation filter and high-pass filter which removes dc offsets. The AD12250A supports sampling frequencies from 8 kHz to 96 kHz and offers 128 F<sub>S</sub>, 256 F<sub>S</sub>, 384 F<sub>S</sub> or 512 F<sub>S</sub> system clock operation modes depending on sampling frequency and master/slave mode selection. The AD12250A is suitable for digital audio media applications which require high performance A/D conversion and low system cost.

**Applications**

- DVD recorders
- CD recorders
- MD players
- HDD players
- A/V receivers
- Personal Video recorders
- Musical Instrument
- Automotive audio applications

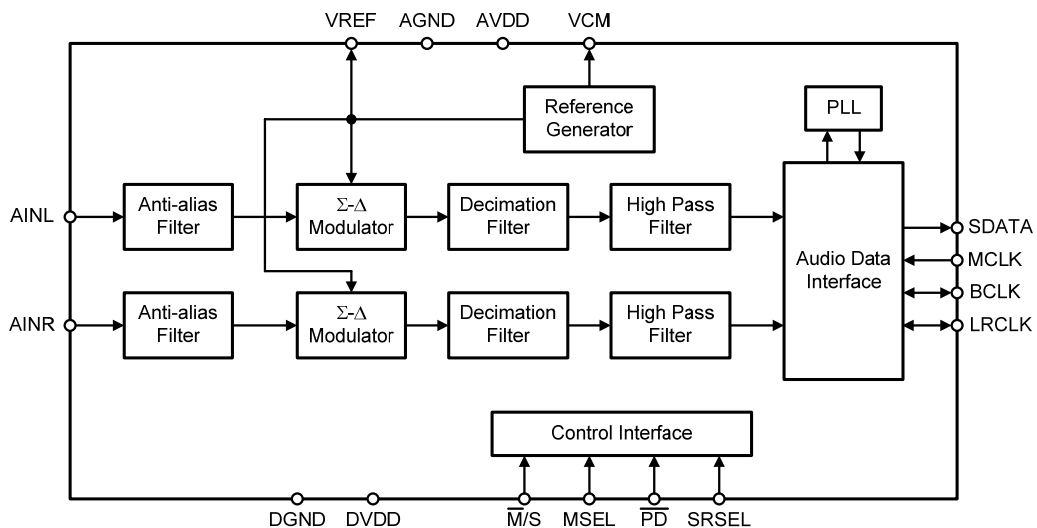
**ORDERING INFORMATION**

Product Number	Package	Comments
AD12250A-SG	16L TSSOP 4.4mm	Pb-free

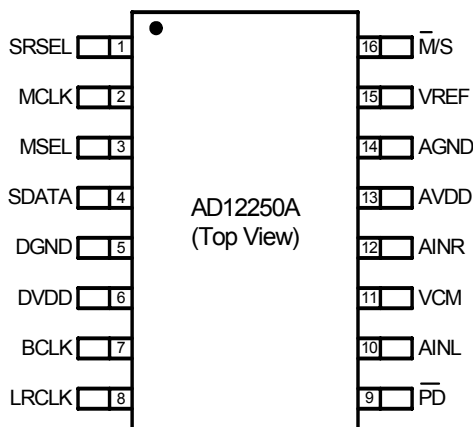
**Description**

The AD12250A converts stereo single-ended analog

**Functional Block Diagram**



**Pin Assignment**



**Pin Description**

Pin	Name	Type	Description	Characteristics
1	SRSEL	I	48kHz/96kHz sample rate selection	Schmitt trigger input buffer
2	MCLK	I	Master clock input	Schmitt trigger input buffer
3	MSEL	I	MCLK divided-by-2 selection in master mode	Schmitt trigger input buffer
4	SDATA	O	Serial audio data output	
5	DGND	P	Digital ground	
6	DVDD	P	Digital supply	
7	BCLK	I/O	Bit clock input/output (64Fs)	Schmitt trigger input buffer
8	LRCLK	I/O	Left/Right clock input/output (Fs)	Schmitt trigger input buffer
9	$\overline{\text{PD}}$	I	Power down, low active	Schmitt trigger input buffer
10	AINL	I	Left channel analog input	
11	VCM	O	Common-mode voltage	
12	AINR	I	Right channel analog input	
13	AVDD	P	Analog supply	
14	AGND	P	Analog ground	
15	VREF	O	Positive reference voltage	
16	$\overline{\text{M/S}}$	I	Master/Slave mode selection	Schmitt trigger input buffer

**Package Options**

Package Type	Part Number	Thermal Information
16L TSSOP 4.4mm	AD12250A-SG	$\theta_{JA} \cong 60 \text{ }^\circ\text{C/W}$ (Condition: still air)

**Absolute Maximum Ratings**

Symbol	Parameter	Min	Max	Units
DVDD	Supply for Digital Circuit	0	3.6	V
AVDD	Supply for Analog Circuit	0	3.6	V
	Analog Input Voltage	AGND	AVDD	V
	Digital Input Voltage	DGND	DVDD	V
T <sub>stg</sub>	Storage Temperature	-65	150	°C
T <sub>a</sub>	Ambient Operating Temperature	-40	85	°C

**Recommended Operating Conditions**

Symbol	Parameter	Min	Typ	Max	Units
DVDD	Supply for Digital Circuit	3.0	3.3	3.6	V
AVDD	Supply for Analog Circuit	3.0	3.3	3.6	V
T <sub>a</sub>	Ambient Operating Temperature	0		70	°C

**Digital Characteristics**

Symbol	Parameter	Min	Typ	Max	Units
V <sub>IH</sub>	High-Level Input Voltage	2.0			V
V <sub>IL</sub>	Low-Level Input Voltage			0.8	V
V <sub>OH</sub>	High-Level Output Voltage	2.4			V
V <sub>OL</sub>	Low-Level Output Voltage			0.4	V
C <sub>i</sub>	Input Capacitance		6.4		pF

**Power Supply Characteristics**

- Condition: T<sub>A</sub> = 25 °C, F<sub>S</sub> = 48 kHz, MCLK = 256 F<sub>S</sub>, slave mode, full-scale 1 kHz input signal

Symbol	Parameter	Condition	Min	Typ	Max	Units
AVDD	Supply for Analog Circuit		3.0	3.3	3.6	V
DVDD	Supply for Digital Circuit		3.0	3.3	3.6	V
I <sub>A</sub>	Analog Power Supply Current	AVDD = 3.3 V		18		mA
I <sub>D</sub>	Digital Power Supply Current	DVDD = 3.3 V		12		mA
P <sub>C</sub>	Power Consumption	Normal Operation, AVDD, DVDD = 3.3 V		99		mW
		Power Down		<0.5		μW
PSRR	Power Supply Rejection Ratio (Note1)	1 kHz signal at AVDD		56		dB

Note1: PSRR = 56dB for 1μF capacitor on VCM pin and 36dB for 0.1μF capacitor on VCM pin.