

## **2.5W/CH Stereo Filter-less Class-D Audio Amplifier with Headphone Driver**

### **Features**

- Supply voltage range: 2.5 V to 5.5 V
- Support single-ended or differential analog input
- Low static operation current
- Low shut-down current
- Short power-on transient time
- Two volume control modes
  - DC volume control from -38dB to +20dB
  - 4-step volume gain of +6, +12, +18, +24dB
- Independent shut-down control for left or right channel
- Short-circuit and thermal protection
- Loudspeaker power within 10% THD+N
  - 1.5W/ch into 8Ω loudspeaker
  - 2.5W/ch into 4Ω loudspeaker
- Loudspeaker efficiency
  - 90% @ 8Ω,  $P_{o,10\% \text{ THD+N}}$
  - 85% @ 4Ω,  $P_{o,10\% \text{ THD+N}}$
- Headphone power within 1% THD+N
  - 120mW/ch into 16Ω headphone

### **Applications**

- Monitor audio
- PDA
- Portable multimedia devices
- Notebook computer
- Mobile phone

### **Description**

The AD5265A is a stereo, filter-less class-D audio amplifier with headphone driver. Operating with 5.0V loudspeaker driver supply, it can deliver 2.5W/CH output power into 4 Ω loudspeaker within 10% THD+N and 120mW/CH output power into 16Ω headphone within 1% THD+N.

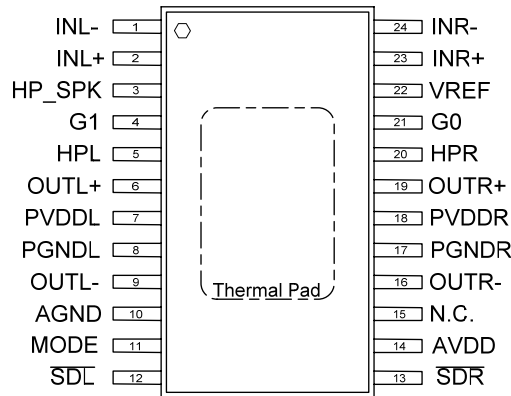
The AD5265A has two volume control modes by setting MODE pin. While MODE pin is set logic high, AD5265A is in DC volume control mode with 31-step volume gain from -38 dB to +20dB, adjusted by the DC voltage applied on G0 pin. Otherwise, AD5265A is the 4-step volume gain mode with +6dB, +12dB, +18dB, and +24dB gain, selected by setting G0 and G1 pins. The two volume adjustment modes are designed to fit the different volume control requirements in various applications. Not only the stereo class-D amplifier, AD5265A also has a fixed gain (-1V/V) stereo class-AB headphone driver.

The AD5265A packaged as E-TSSOP 24L is a stereo audio amplifier with high efficiency, which leads to longer battery life, less heat sink requirement, smaller board size and lower system cost, and suitable for the notebook computer, and portable multimedia devices. With the independent shut-down control for left or right channel, the AD5265A is more convenient to control the left and right channels.

### **Ordering Information**

Part Number	Package	Comments
AD5265A-SEG	E-TSSOP 24L	Pb-free

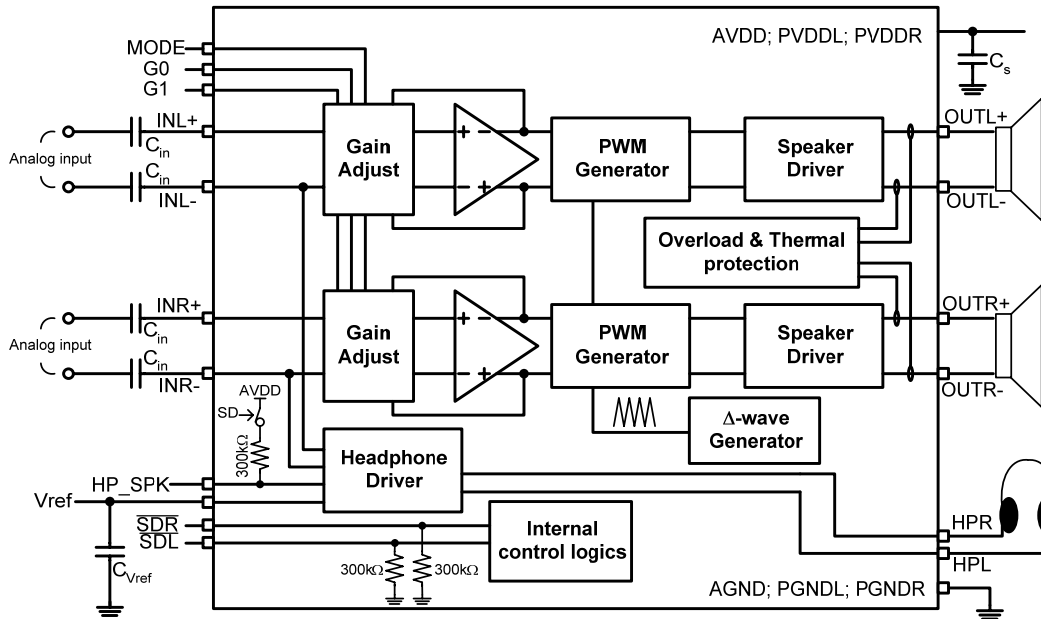
### Pin Assignments



### Pin Description

NAME	TYP	DESCRIPTION	CHARACTERISTIC	
1	INL-	I	Left channel Input (-)	
2	INL+	I	Left channel Input (+)	
3	HP_SPK	I	0: SPK mode; 1: HP mode	
4	G1	I	Gain selection	with 300 k $\Omega$ pull-low resistor
5	HPL	O	Left channel headphone driver	
6	OUTL+	O	Left channel output (+)	
7	PVDDL	P	High current power supply	
8	PGNDL	G	High current ground	
9	OUTL-	O	Left channel output (-)	
10	AGND	G	Ground	
11	MODE	I	0: 4-gain control; 1:DC Vol. control	with 300 k $\Omega$ pull-low resistor
12	$\overline{SDL}$	I	Shut-down left channel (Low active)	with 300 k $\Omega$ pull-low resistor
13	$\overline{SDR}$	I	Shut-down right channel (Low active)	with 300 k $\Omega$ pull-low resistor
14	AVDD	P	Power supply	
15	N.C.	x	N.C.	
16	OUTR-	O	Right channel output (-)	
17	PGNDR	G	High current ground	
18	PVDDR	P	High current power supply	
19	OUTR+	O	Right channel output (+)	
20	HPR	O	Right channel headphone driver	
21	G0	I	Gain selection(mode=0) /DC vol. level(mode=1)	
22	VREF	O	Reference voltage	
23	INR+	I	Right channel Input (+)	
24	INR-	I	Right channel Input (-)	
Thermal Pad	G		Must be soldered to PCB's ground plane	

**Functional Block Diagram**



**Available Package**

Package Type	Device no.	$\theta_{JA}$ (°C/W)	Exposed Thermal Pad
E-TSSOP 24L	AD5265A	32.3	Yes ( <b>Note1</b> )

**Note1:** The thermal pad is at the bottom of package. To optimize the performance of thermal dissipation, solder the thermal pad to PCB's ground plane is suggested.

**Absolute Maximum Ratings**

SYMBOL	PARAMETER	MIN	MAX	UNIT
AVDD	Power supply for lower power analog cells	2.5	5.5	V
PVDDL(R)	Power supply for loudspeaker driver	2.5	5.5	V
	Input voltage	-0.3	AVDD	V
T <sub>stg</sub>	Storage temperature	-65	150	°C
T <sub>a</sub>	Ambient operating temperature	0	70	°C