2.5W Mono Filter-less Class-D Audio Amplifier

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
- Internal pull-low resistor on shut-down pins
- Short-circuit protection
- Over-temperature protection
- Loudspeaker power within 10% THD+N
  - 1.5W/ch into 8Ω loudspeaker
  - 2.5W/ch into 4Ω loudspeaker
- Loudspeaker efficiency
  - 89% @ 8Ω, THD+N=10%
  - 84% @ 4Ω, THD+N=10%

Applications

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

Description

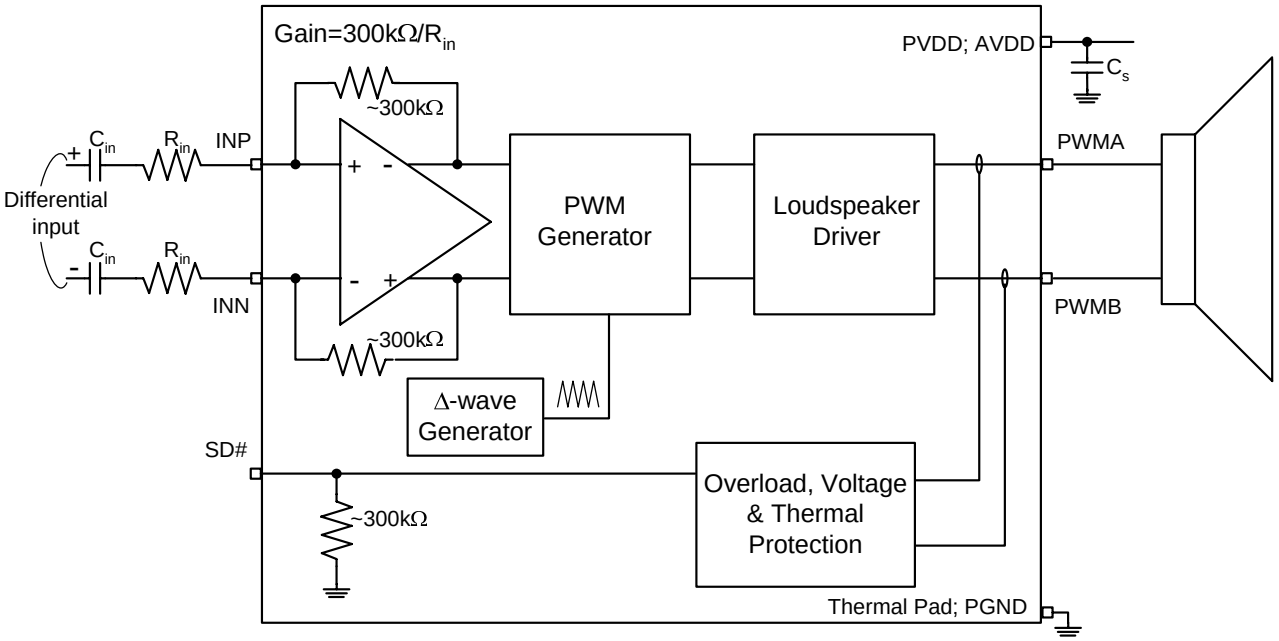
The AD5165A is a mono, filter-less class-D audio amplifier. Operating with 5.0V loudspeaker driver supply, it can deliver 2.5W output power into 4 Ω loudspeaker within 10% THD+N.

The AD5165A packaged as DFN 8L is a mono audio amplifier with high efficiency and suitable for the notebook computer, and portable multimedia devices.

Ordering Information

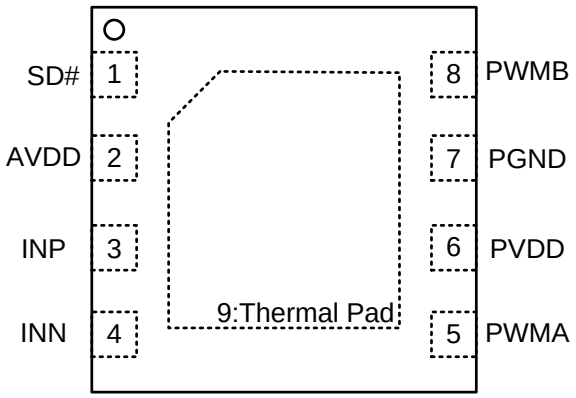
Part Number	Package	Comments
AD5165A	DFN 8L, 3x3 mm	Pb-free

Functional Block Diagram



Pin Assignments

DFN 8L, 3x3mm



Pin Description

Pin	NAME	TYP	DESCRIPTION
1	SD#	I	Shutdown AD5165A (Low active logic)
2	AVDD	P	Power Supply
3	INP	I	Positive differential input
4	INN	I	Negative differential input
5	PWMA	O	Positive output
6	PVDD	P	High current power supply
7	PGND	G	High current ground
8	PWMB	O	Negative output
9	Thermal Pad	G	Must be soldered to PCB's ground plane

Available Package

Package Type	Device no.	θ_{JA} (^{o}C/W)	Exposed Thermal Pad
DFN 8L (3x3)	AD5165A	45.8	Yes

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	Supply for lower power analog cells	2.5	5.0	V
PVDD	Supply for loudspeaker driver	2.5	5.0	V
	Input voltage	-0.3	AVDD	V
T_{stg}	Storage temperature	-65	150	^{o}C
T_a	Ambient operating temperature	0	70	^{o}C

Recommended Operating Conditions

SYMBOL	PARAMETER	TYP	UNIT
AVDD	Supply for lower power analog cells	2.5~5.0	V
PVDD	Supply for loudspeaker driver	2.5~5.0	V
V_{IH}	High-Level Input Voltage	2.0	V
V_{IL}	Low-Level Input Voltage	0.8	V
T_a	Ambient Operating Temperature	0~70	^{o}C

General Electrical Characteristics

SYMBOL	PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
I_{PD}	Supply current during power-down mode	AVDD=PVDD=5.0V; SD#=0		2	50	μA
V_{offset}	Output offset voltage	Input ac grounded, VDD=2.5V~5.0V		5	25	mV
	Junction temperature for driver shutdown		145	150	155	^{o}C
	Temperature hysteresis for recovery from shutdown		115	120	125	^{o}C
f_{sw}	Switching rate of loudspeakers driver		300	450	600	kHz
R_{SC}	Loudspeaker short-circuit detect resistance	PVDD = 5 V		2.8	3.2	Ω