3W Filterless Class-D Stereo Audio Power Amplifier

Description

The PAM8403 is a stereo audio power amplifier that offers Class-AB performance with Class-D efficiency. It utilizes a low-noise, filterless architecture, eliminating the need for traditional Class-D output low-pass filters. Requiring minimal external components, it saves significant PCB space and system cost, making it an ideal choice for portable applications.

The PAM8403 delivers up to 3W of power at over 85% efficiency, and features system shutdown and mute control functions. Its specialized circuit architecture enhances noise immunity and reduces radio frequency (RF) interference.

Key Features

- Filterless Class-D amplifier with low quiescent current and low EMI
- 3W output power (delivers up to 3W at 4Ω load and 5V supply)
- High efficiency up to 90%
- Low THD+N, low noise
- Short circuit protection
- Thermal shutdown protection
- Minimal external components required, saving space and cost
- Package style: SOP-16 (Lead-Free / RoHS compliant)
- Shutdown current: 16μA
- Standby current: 6.3mA

Applications

- LCD TVs, Monitors
- Cellular phones / Hands-free speakerphones
- Notebook computers
- Portable DVD players, Handheld game consoles

Pin Configuration (SOP-16)

Pin No.	Pin Name	I/O	Description
1	OUTL+	O	Left Channel Non-Inverting Output
2, 15	PGND	GND	Power Ground
3	OUTL-	O	Left Channel Inverting Output
4, 13	PVDD	POWER	Power Supply
5	MUTE	I	Mute Control Input (Active Low)
6	VDD	POWER	Analog Power Supply
7	INL	I	Left Channel Input
8	VREF	I	Internal reference voltage; connect a bypass capacitor to GND
9	NC	NC	No Connection
10	INR	I	Right Channel Input
11	GND	GND	Analog Ground
12	SHDN	I	System Shutdown Control (Active Low)
14	OUTR-	O	Right Channel Inverting Output
16	OUTR+	O	Right Channel Non-Inverting Output

Electrical Characteristics

Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Max	Unit
V_{DD}	Operating Voltage	-	-0.3	5.5	V
V_I	Input Voltage	-	-0.3	V_{DD} + 0.3	V
T_A	Operating Temperature Range	-	-40	85	°C
T_J	Junction Temperature Range	-	-40	125	°C
T_{STG}	Storage Temperature Range	-	-65	150	°C
T_{SLD}	Soldering Temperature	5 Seconds	-	300	°C

Electrical Characteristics (T_A = 25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DD}	Supply Voltage	AVDD, PVDD	2.2	-	5.5	V
V_{IH}	SHDN Input High Voltage	V_{DD} = 5V	1.3	-	-	V
V_{IL}	SHDN Input Low Voltage	V_{DD} = 5V	-	-	0.4	V
V_{IH}	MUTE Input High Voltage	V_{DD} = 5V	1.3	-	-	V
V_{IL}	MUTE Input Low Voltage	V_{DD} = 5V	-	-	0.4	V

Package Dimensions (SOP-16)

Dimensions specified in millimeters (mm) unless otherwise noted:

- **Body Length:** 10.0 mm
- **Body Width:** 3.8 mm (6.0 mm including leads)
- **Body Height:** 1.6 mm
- **Lead Pitch:** 0.8 mm
- **Lead Width:** 0.4 mm