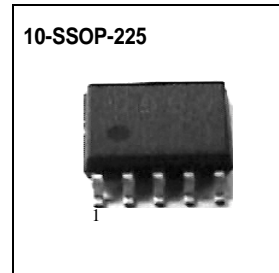


Stereo Headphone Amplifier

Description

The CO8301 is a monolithic integrated circuit and suitable dual amplifier for low power.



Feature

- Low quiescent current
- High power supply ripple rejection
- Low voltage operation
- A few of external part required
- Built in power save switch
- Built in mute switch

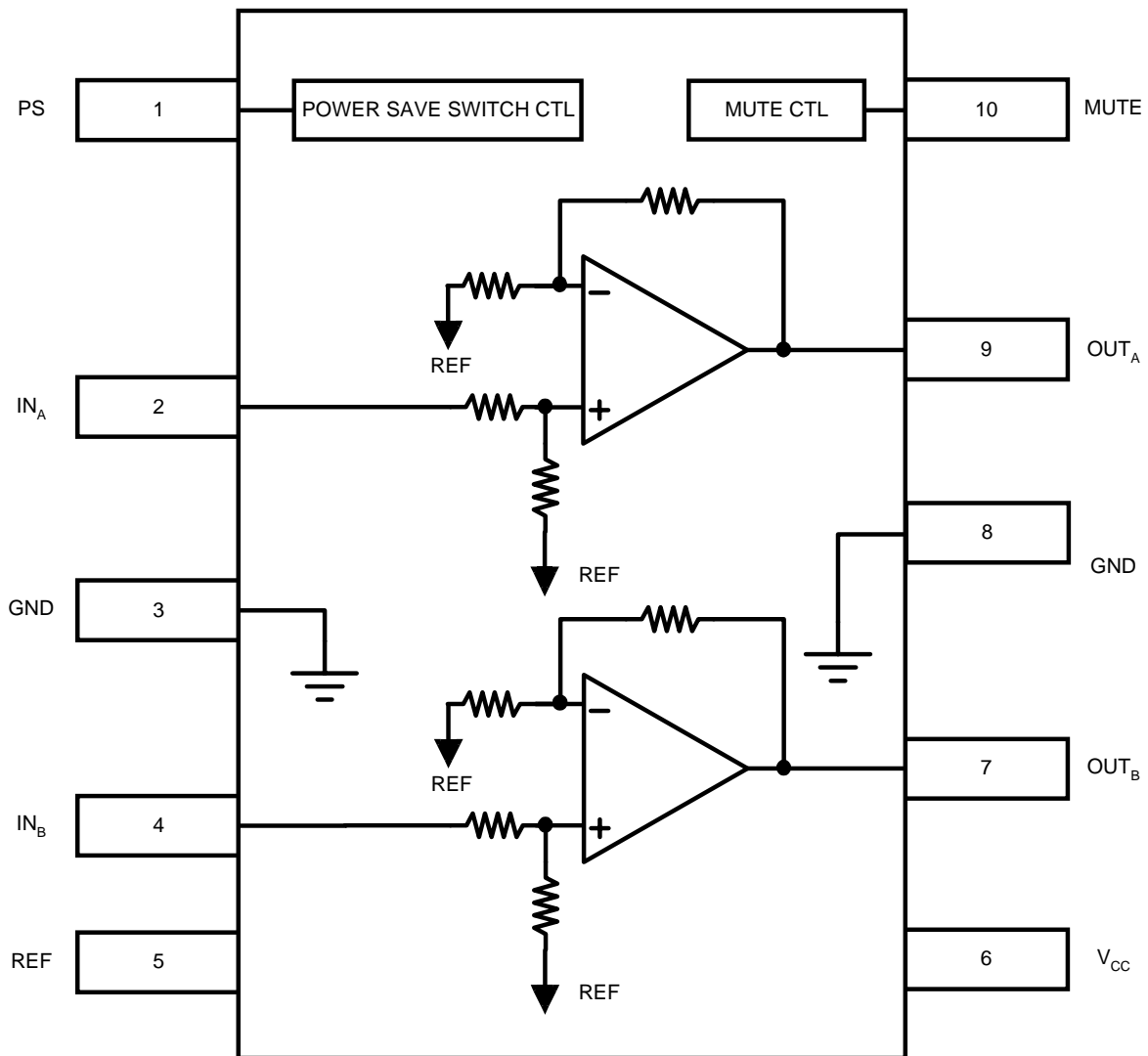
Typical Applications

- Portable compact disk player (DISCMAN)
- Portable mini disk player (MD)
- Disc-Man
- MP3 Player
- CD-Rom
- Other portable compact Disk Media Fan Motor Driver

* All specs and applications shown above subject to change without prior notice.

Stereo Headphone Amplifier

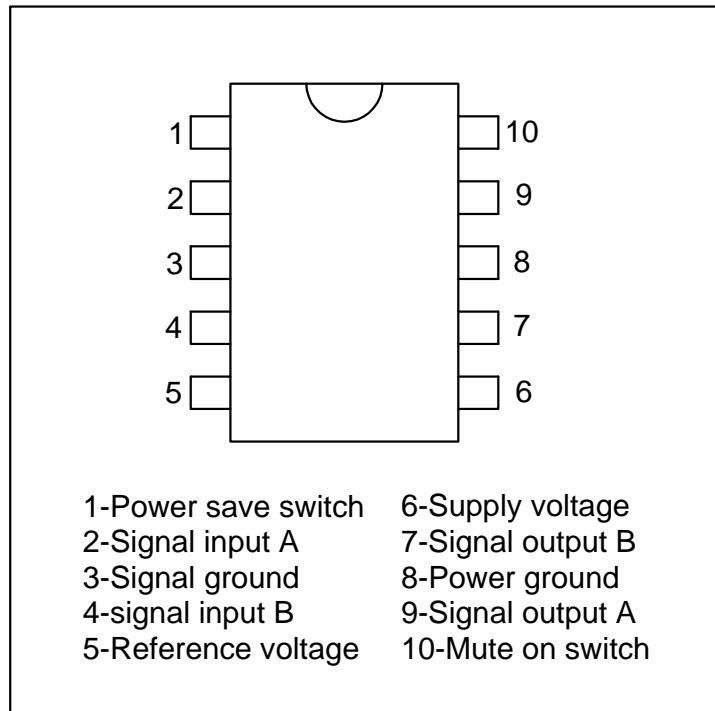
Block Diagram



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Stereo Headphone Amplifier

Pin Configuration



Ordering Information

Device	Package	Operating Temp.
CO8301	10-SSOP-225	-20 ~ +75 .

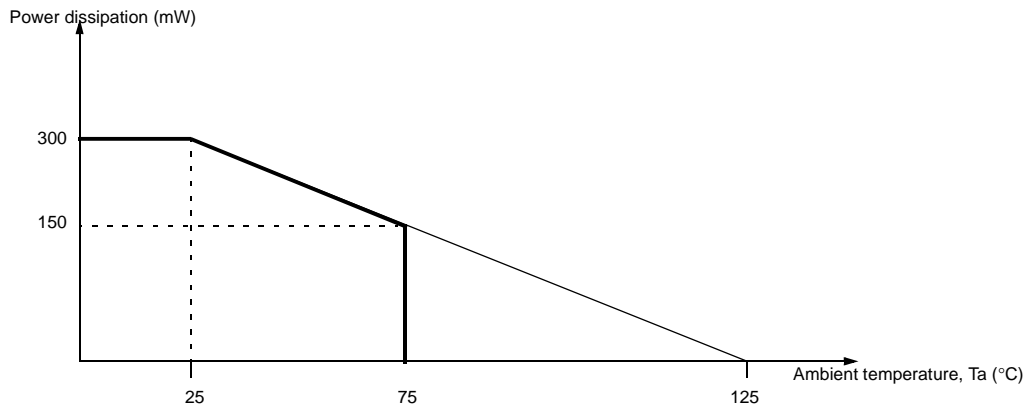
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Stereo Headphone Amplifier

Absolute Maximum Rating (Ta = 25)

Parameter	Symbol	Value	Unit	Remark
Maximum Supply Voltage	VCC	4.5	V	Maximum Supply Voltage
Power Dissipation	PD	300	mW	Power Dissipation
Operating Temperature	TOPR	-20 ~ +75	°C	Operating Temperature
Storage Temperature	TSTG	-55 ~ +125	°C	Storage Temperature
Thermal Resistance	T _{ja}	150	°C/W	-

Power Dissipation Curve



Recommended Operating Conditions (Ta = 25)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Supply Voltage	VCC	1.8	3.0	4.0	V
Recommended Load	RL	16	-	32	Ω

* All specs and applications shown above subject to change without prior notice.

Electrical Characteristics (RL = 16 Ω , Rg = 600 Ω , Ta = 25 $^{\circ}$ C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescent Current 1	ICC1	VCC = 2.4V	-	5.5	10.0	mA
Quiescent Current 2	ICC2	VCC = 4.5V, Mute = GND	-	1.0	2.0	mA
Quiescent Current 3	ICC3	VCC = 4.5V, PS = GND	-	-	1.0	μ A
Close Loop Voltage Gain 1	GVC1	VCC = 2.4V, f = 1kHz, VO = -10dBm	30	32	34	dB
Close Loop Voltage Gain 2	GVC1	VCC = 1.8V, f = 1kHz, VO = -20dBm	29	32	34	dB
Channel Balance 1	Δ GV1	VCC = 2.4V, f = 1kHz, VO = -10dBm	-	-	1.0	dB
Channel Balance 2	Δ GV2	VCC = 1.8V, f = 1kHz, VO = -20dBm	-	-	1.0	dB
Total Harmonic Distortion	THD	VCC = 2.0V, f = 1kHz, PO = 1mW	-	0.5	1.5	%
Ripple Rejection Ratio	RR	VCC = 1.8V, f = 100Hz, Rg = 1k Ω , VR = -20dBm, BPF = 100Hz	43	60	-	dB
Crosstalk	CT	VCC = 2.4V, f = 100Hz, Rg = 1k Ω , VO = -10dB	43	50	-	dB
Output Noise Voltage	VNOISE	VCC = 4.5V, Rg = 1k Ω , BPF = 20Hz ~ 20kHz	-	60	100	μ Vrms
Output Power	POUT	VCC = 3.0V, f = 1kHz, THD = 10%	20	40	-	mW
PS Attenuation Ratio	ATT _{PS}	VCC = 1.8V, f = 100Hz, PS = GND, VIN = -10dB	-	-	-80	dB
MUTE Attenuation Ratio	ATT _{MU}	VCC = 1.8V, f = 100Hz, MUTE = GND, VIN = -10dB	-	-	-80	dB
PS ON Input Current	IPSON	VCC = 1.5V, VREF \geq 0.85V	-	0.2	1.0	μ A
MUTE OFF Input Current	IMOFF	VCC = 1.5V, VREF \geq 0.85V	-	0.2	1.0	μ A
PS ON High Level	VHPS	VCC = 1.5V, VREF \geq 0.85V	0.5	0.65	-	V
MUTE OFF High Level	VHMU	VCC = 1.5V, VREF \geq 0.85V	0.5	0.65	-	V

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Application Information

1. PS Block

This block diagram describes the power save switch circuits.

The drive block is controlled by PS pin, which can be derived from micro controller.

It controls bias of the internal circuits of CO8301, so that it makes CO8301 operate when input voltage level reaches high level.

2. Mute Block

The block diagram describes the mute on switch circuits.

The drive block is controlled by MUTE pin, which can be derived from micro controller.

When the pin of mute turns on, it makes reference voltage of internal circuits approximately 0V, so that it keeps the device of CO8301 off.

3. AMP Block

This block diagram describes the AMP block with resistances, which control gain of CO8301.

The gain of CO8301 is $\frac{V_{OUT}}{V_{IN}} \cong 40 \cong 32[\text{dB}]$

Output voltage of CO8301 can be 40 times as much as input voltage, so it eliminates the number of external circuits and offers headphone input.

4. Popping Noise Reduction

If PS pin (Pin1 , Power save switch) connect the micro controller, the micro controller must follow the same sequence 1 in order to reduce popping noise on mute mode.

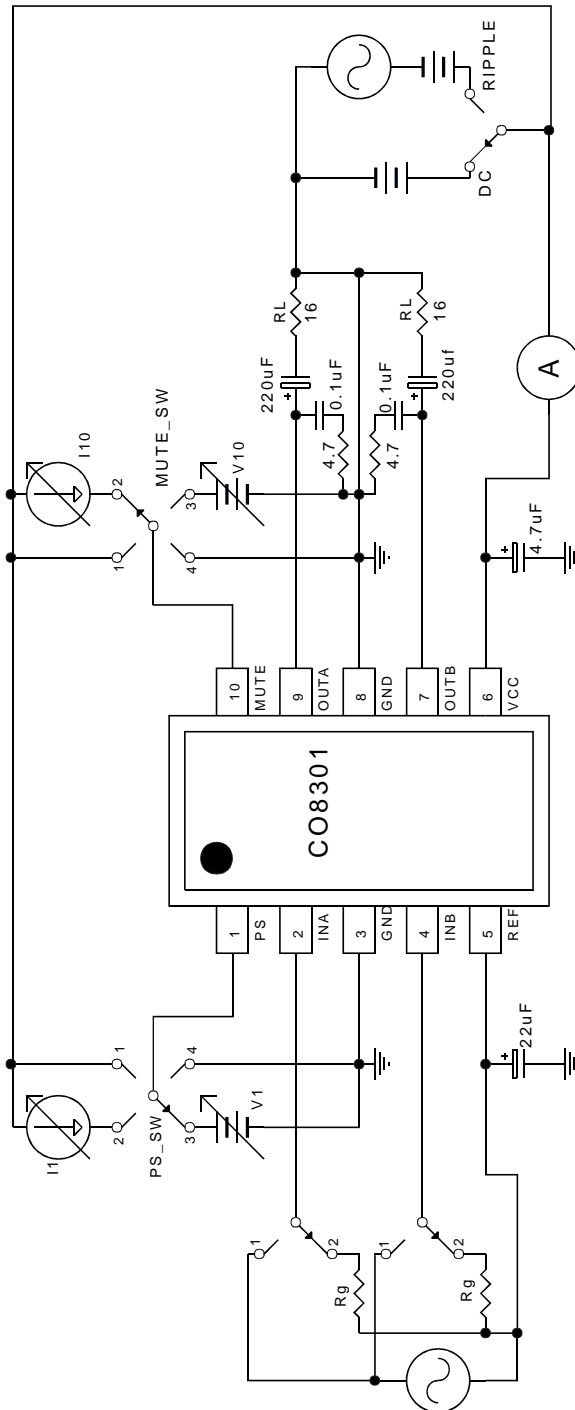
PS on → Mute on → PS off → Mute operation → PS on → Mute off → Normal operation (Sequence 1) If PS connect VCC, the micro controller follow the sequence 2.

Mute on → Mute Operation → Mute off → Normal operation (Sequence 2)

* All specs and applications shown above subject to change without prior notice.

Stereo Headphone Amplifier

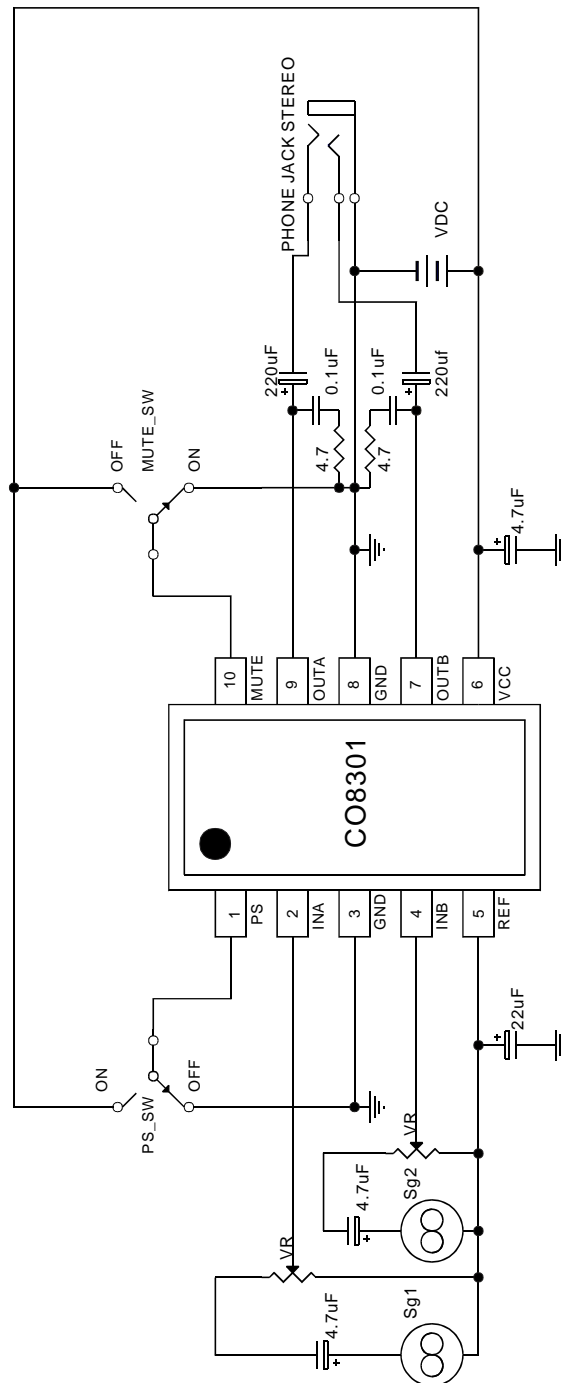
Test Circuits



* All specs and applications shown above subject to change without prior notice.

Stereo Headphone Amplifier

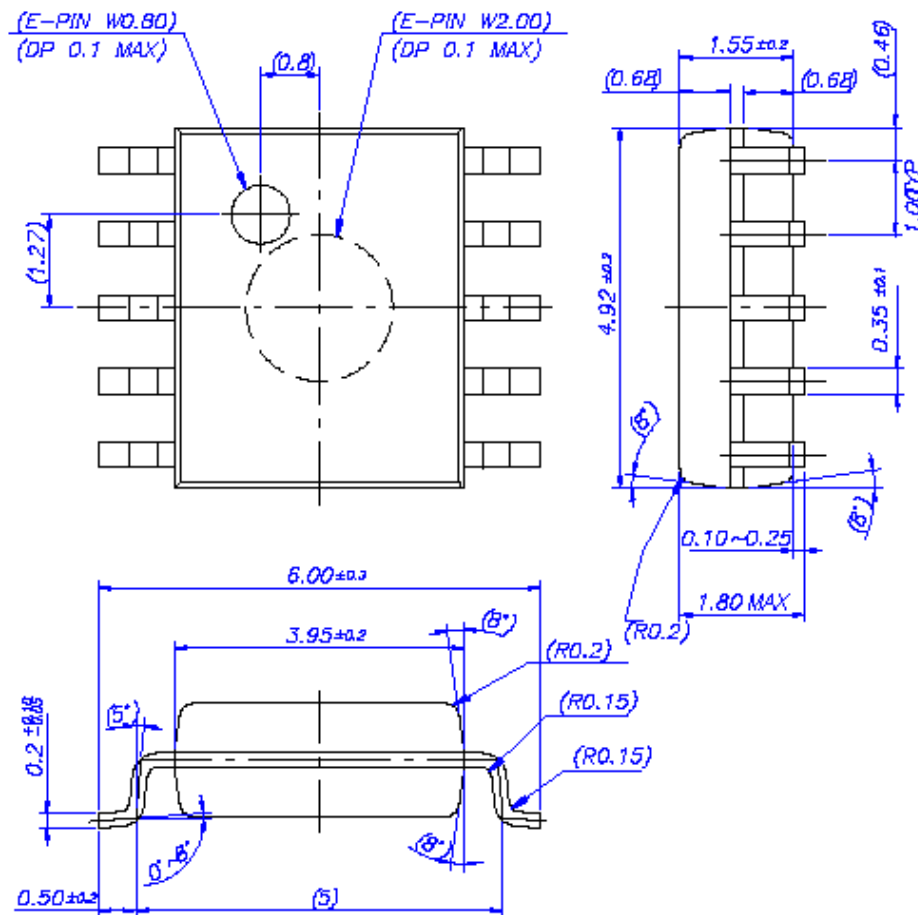
Typical Application Circuits



* All specs and applications shown above subject to change without prior notice.

Package Dimensions

10-SSOP-225



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