

LOW VOLTAGE HEADPHONE AMPLIFIER for PORTABLE AUDIO

■ GENERAL DESCRIPTION

The **NJM2171A** is a low voltage headphone amplifier designed for portable audio items.

The **NJM2171A** operates directly for battery supply. It includes mute and standby circuit which require few external components and realize low current consumption and very low turn-noise at standby mode.

It is suitable for portable Mini-Disc, portable Compact-Disc, and other headphone amplifier application.

■ PACKAGE OUTLINE

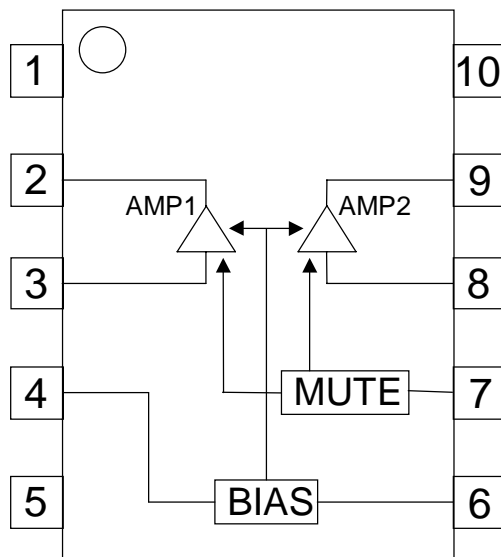


NJM2171AR

■ FEATURES

- Operating Voltage V⁺1=1.8 to 4.5V
V⁺2=0.9 to 4.5V
- Operating Current 450μA typ. @V⁺1=2.3V
700μA typ. @V⁺2=1.2V
- Supply Current in Power Down Mode 10μA typ. @V⁺1=2.3V
25μA typ. @V⁺2=1.2V
- Output Power Exceeds 5mW R_L=16Ω @THD=10%
- Fixed Voltage Gain 11.5dB typ.
- Package Outline VSP10
- Bipolar Technology

■ PIN CONFIGURATION



PIN FUNCTION

- 1.V⁺2
- 2.OUT1
- 3.IN1
- 4.STBY
- 5.V⁺1
- 6.V_{REF}
- 7.MUTE
- 8.IN2
- 9.OUT2
- 10.GND

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	5	V
Power Dissipation	P _D	(VSP8) 320	mW
Operating Temperature Range	T _{opr}	-20 to +75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ RECOMMENDED OPERATING CONDITIONS

(Ta=25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Operating Voltage Range1	V ⁺ 1	1.8	2.3	4.5	V
Operating Voltage Range2	V ⁺ 2	0.9	1.2	4.5	V

■ ELECTRICAL CHARACTERISTICS (V⁺1=2.3V, V⁺2=1.2V, R_g=600Ω, R_L=16Ω, f=1kHz, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC0}	V ⁺ 1=0V(1pin)	-	-	1	μA
	I _{CC1}	STANDBY ON, MUTE ON(1pin)	-	25	40	
	I _{CC2}	STANDBY ON, MUTE ON(5pin)	-	10	15	
	I _{CC3}	No signal(1pin)	-	700	1200	
	I _{CC4}	No signal(5pin)	-	450	700	
	I _{CC5}	P _O =0.5mW+0.5mW(1pin)	-	5.5	-	mA
	I _{CC6}	P _O =0.5mW+0.5mW(5pin)	-	0.8	-	
Reference Voltage	V _{REF}	No signal	0.55	0.60	0.65	V
Closed Loop Gain	G _V	V _{IN} =-30dBV	10.5	11.5	12.5	dB
Output Power	P _{O1}	THD=10%	5.0	8.5	-	mW
	P _{O2}	V ⁺ 1=1.8V, V ⁺ 2=0.9V, THD=10%	2.0	4.0	-	
Total Harmonic Distortion	THD1	P _O =1mW, R _L =16Ω	-	0.15	0.3	%
	TED2	P _O =5mW, R _L =16Ω	-	0.4	0.6	
Output Noise Voltage	V _{NO}	A-Weighted	-	-100	-96	dBV
Crosstalk	CT	V _{IN} =-30dBV	-	-80	-70	dBV
Mute Level	MUTE	MUTE-ON, V _{IN} =-30dBV, A-Weighted	-	-95	-80	dBV
Supply Voltage Rejection Ratio	SVR1	V ⁺ 1=1.8V+0.1Vrms, V ⁺ 2=0.9V	60	70	-	dB
	SVR2	V ⁺ 1=1.8V, V ⁺ 2=0.9V+0.1Vrms	60	70	-	

■ CONTROL TERMINAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
High Level Input Voltage	V_{IH}	STBY(4pin), MUTE(7pin)	1.2	-	V^{+1}	V
Low Level Input Voltage	V_{IL}	STBY(4pin), MUTE(7pin)	0	-	0.3	V

■ CONTROL TERMINAL EXPLANATION

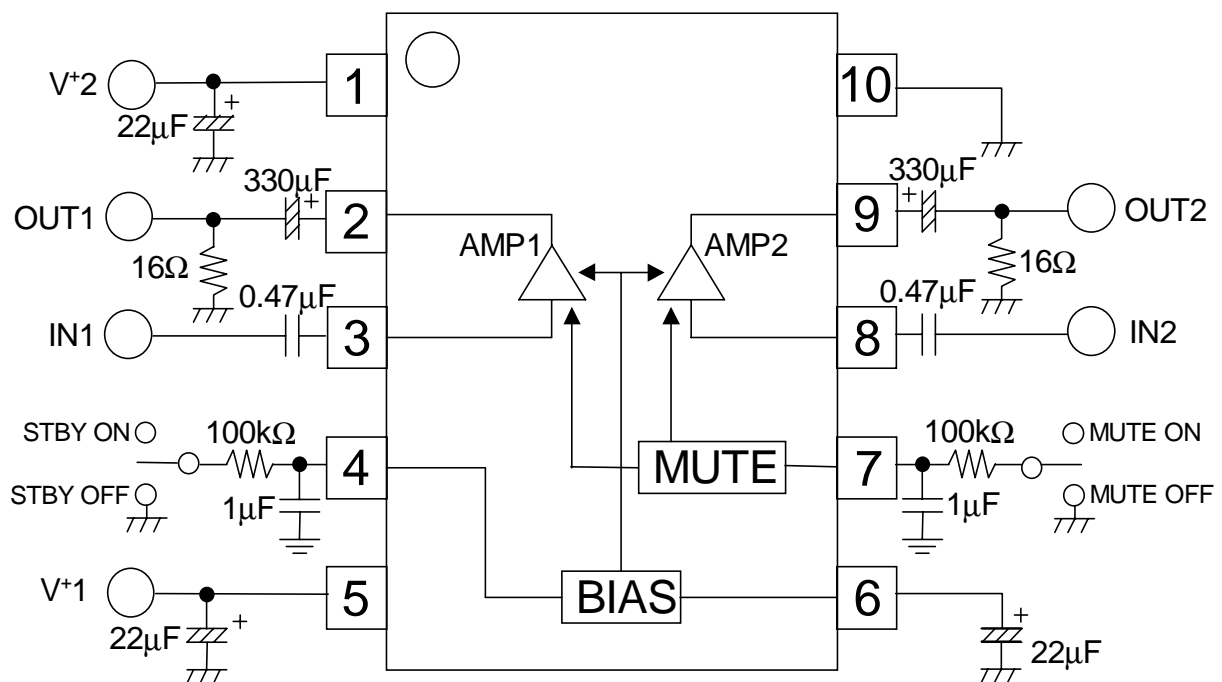
●STBY (4Pin)

PARAMETER	CONTROL SIGNAL	STATUS
STANDBY ON	H	IC is non-active.
STANDBY OFF	L	IC is active.

●MUTE (7Pin)

PARAMETER	CONTROL SIGNAL	STATUS
MUTE ON	H	IC doesn't output the signal.
MUTE OFF	L	IC output the signal.

■ APPLICATION CIRCUIT



[CAUTION]

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