

## HEADPHONE AMPLIFIER for CD-ROM

### GENERAL DESCRIPTION

The **NJM2768B** is a headphone amplifier designed for CD-ROM.

It includes 0dB closed loop gain and mute circuit, requires few external component.

The **NJM2768B** realizes very low turn-noise at mute mode. It is suitable for CD-ROM, and other general audio headphone amplifier application.

### PACKAGE OUTLINE



**NJM2768BM (DMP8)**



**NJM2768BRB1 MSOP8(TVSP8)**

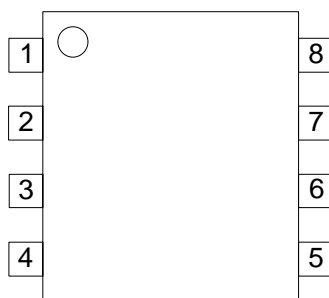
### FEATURES

- Operating Voltage 2.8 to 5.5V
- Operating Current 2mA typ. at  $V^+ = 5V$
- Fixed Gain 0dB typ.
- Stereo Headphone Output
- Internal Mute Circuit
- Bipolar Technology
- Package Outline

DMP8  
MSOP8(TVSP8)\*

\*MEET JEDEC MO-187-DA / THIN TYPE

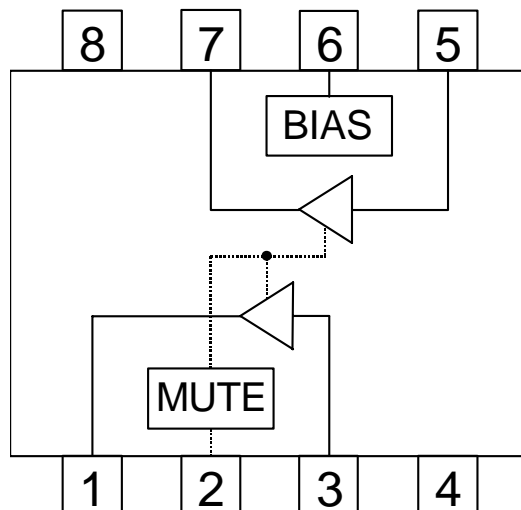
### PIN CONFIGURATION



#### PIN FUNCTION

- 1.OUT1
- 2.MUTE
- 3.IN1
- 4.GND
- 5.IN2
- 6.BIAS
- 7.OUT2
8. $V^+$

### BLOCK DIAGRAM



# NJM2768B

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	+7	V
Power Dissipation	P <sub>D</sub>	(DMP8) 375 750 (note) (MSOP8(TVSP8))320	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-50 to +150	°C

(note) At on PC board

## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=5.0V, Vin=0dBV, f=1kHz, R<sub>L</sub>=32Ω, Ta=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sup>+</sup>		2.8	5.0	5.5	V
Operating Current	I <sub>CC</sub>	No Signal	-	2.0	4.0	mA
Reference Voltage	V <sub>ref</sub>	No Signal	-	2.1	-	V
Closed Loop Gain	G <sub>v</sub>		-1	0	1	dB
Channel Balance	ΔG <sub>v</sub>		-0.5	0	+0.5	dB
Output Power	P <sub>O1</sub>	R <sub>L</sub> =32Ω, THD=0.1%	30	50	-	mW
	P <sub>O2</sub>	R <sub>L</sub> =16Ω, THD=0.1%	40	100	-	mW
Total Harmonic Distortion	THD		-	0.02	0.1	%
Output Noise Voltage	V <sub>no</sub>	R <sub>g</sub> =0Ω, A-Weighted	-	-104 (6.3)	-94 (20)	dBV (μVrms)
Mute Attenuation	ATT	V <sub>o</sub> /V <sub>in</sub>	-	-80	-70	dB
Channel Separation	CS		90	110	-	dB
Ripple Rejection Ratio	RR	V <sub>ripple</sub> =-20dBV, R <sub>g</sub> =0Ω	-	70	-	dB
Input Voltage H-level	V <sub>IH</sub>		2.0	-	V <sup>+</sup>	V
Input Voltage L-level	V <sub>IL</sub>		0.0	-	0.3	V

## ■ CONTROL PIN INFORMATION

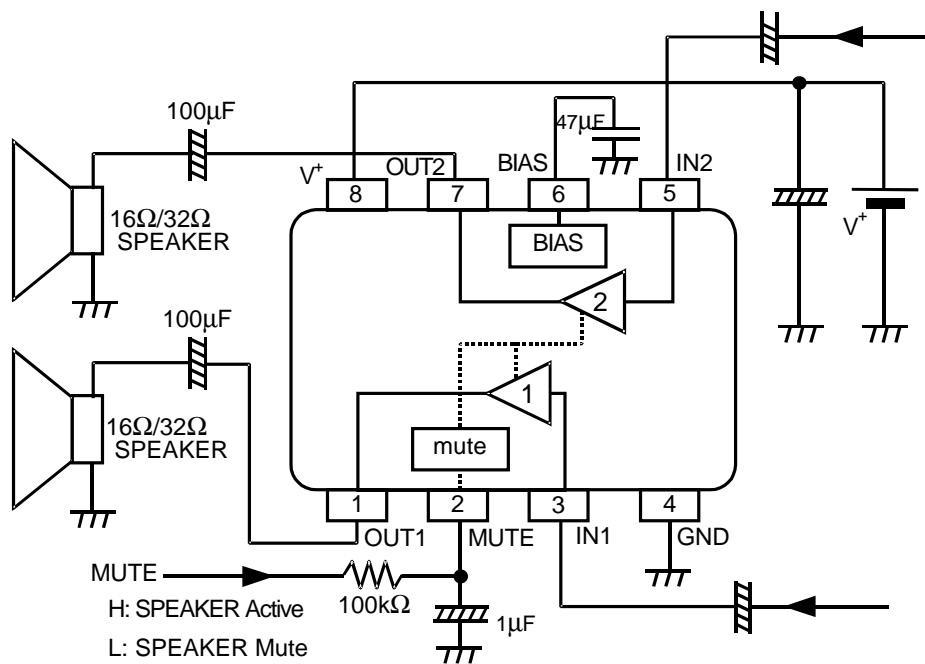
PARAMETER	CONTROL SIGNAL	OPERATING CONDITION
MUTE ON	L	NON-SIGNAL
MUTE OFF	H	OUTPUT SIGNAL

## ■ TERMINAL DESCRIPTION

PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE
1 7	OUT1 OUT2	OUTPUT1 OUTPUT2		$(V^+ - 1V_{BE})/2$
2	MUTE	MUTE CONTROL		-
3 5	IN1 IN2	INPUT1 INPUT2		$(V^+ - 1V_{BE})/2$
6	BIAS	REFERENCE VOLTAGE STABILIZED CAPACITOR CONNECT TERMINAL		$(V^+ - 1V_{BE})/2$

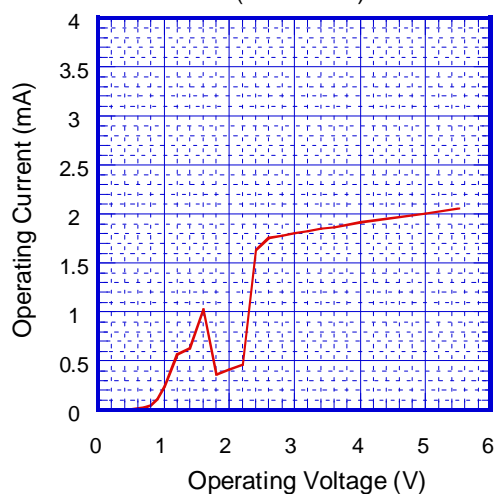
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## ■ TYPICAL APPLICATION

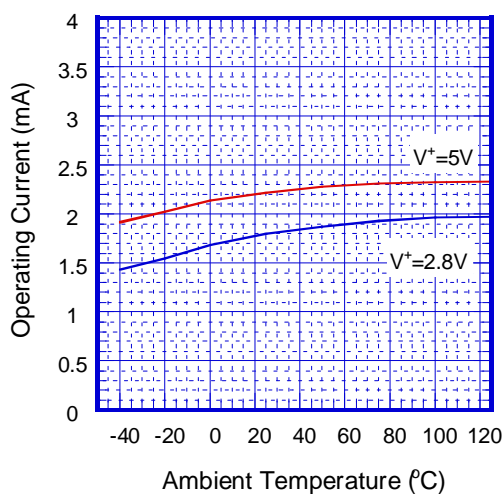


## ■ TYPICAL CHARACTERISTICS

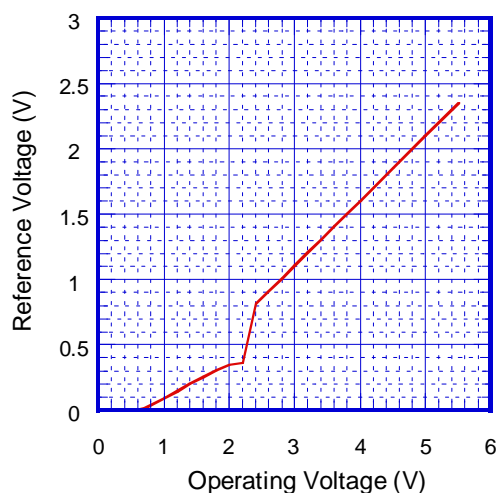
Operating Current vs. Operating Voltage  
(MUTE=V+)



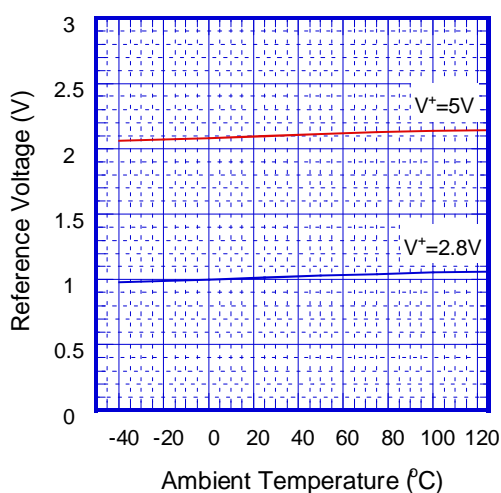
Operating Current vs. Ambient Temperature



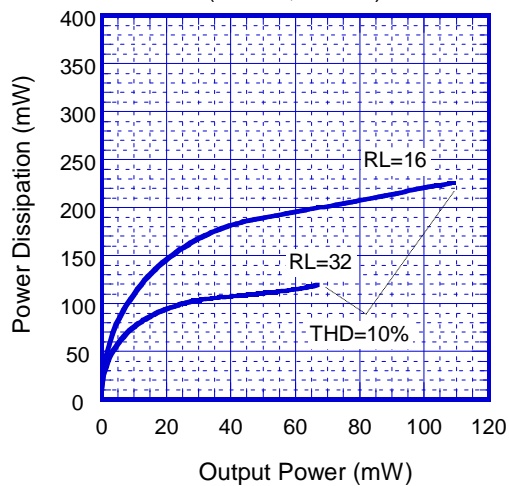
Reference Voltage vs. Operating Voltage



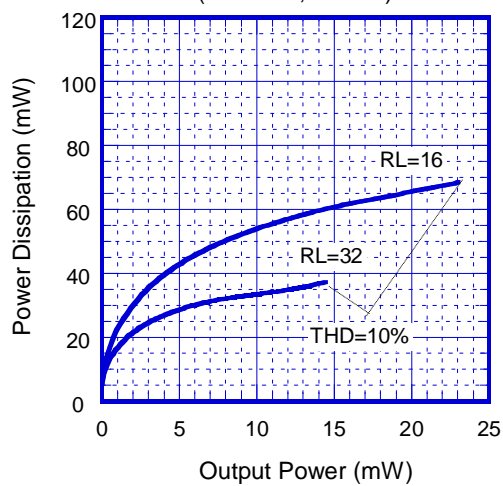
Reference Voltage vs. Ambient Temperature



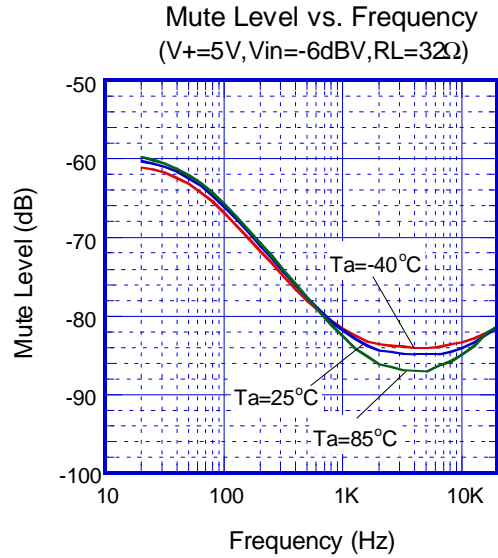
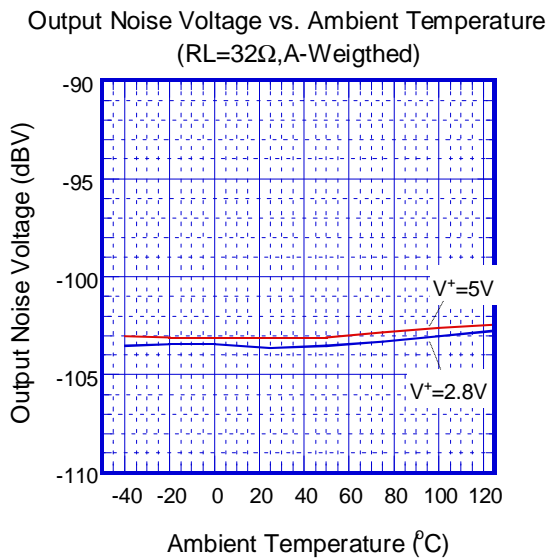
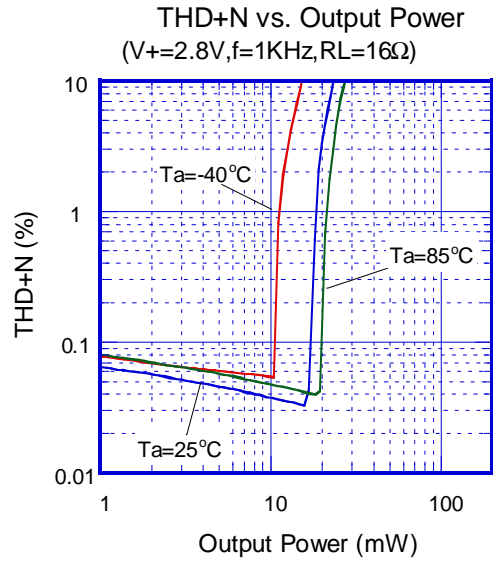
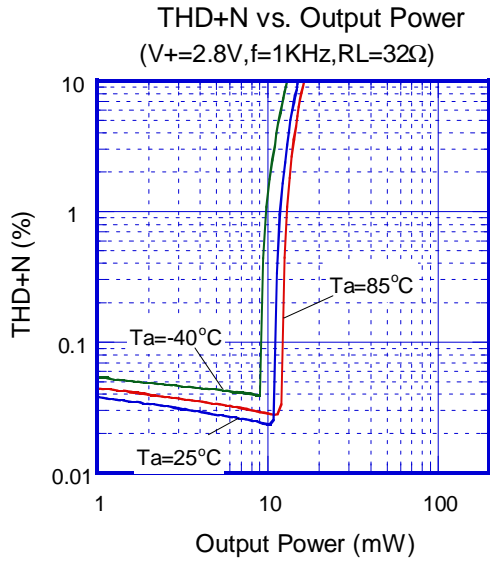
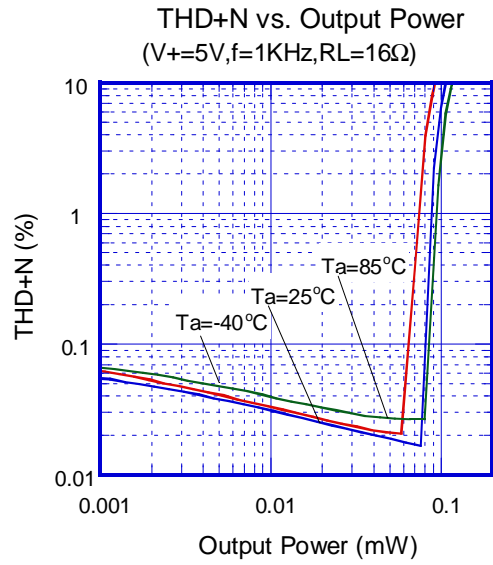
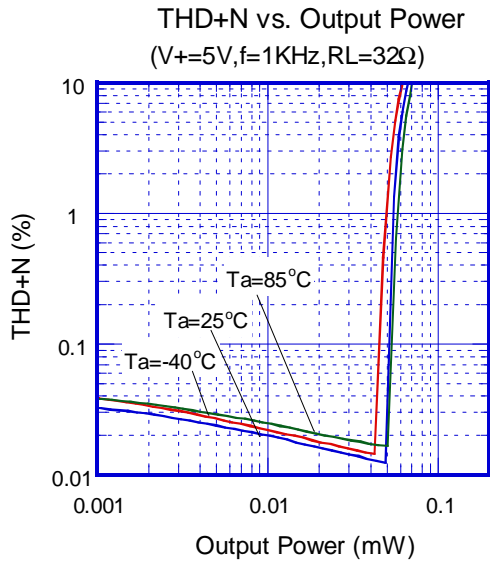
Power Dissipation vs. Output Power  
(V+=5V, f=1KHz)



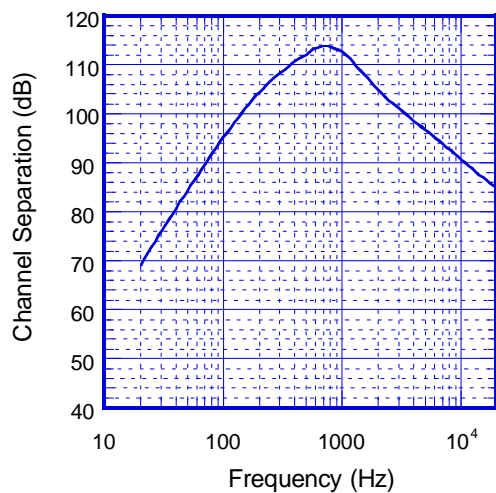
Power Dissipation vs. Output Power  
(V+=2.8V, f=1KHz)



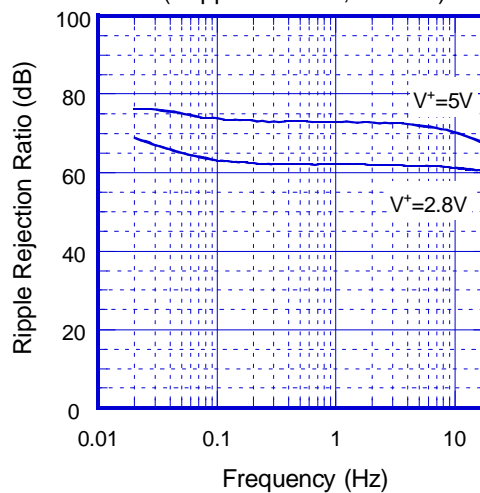
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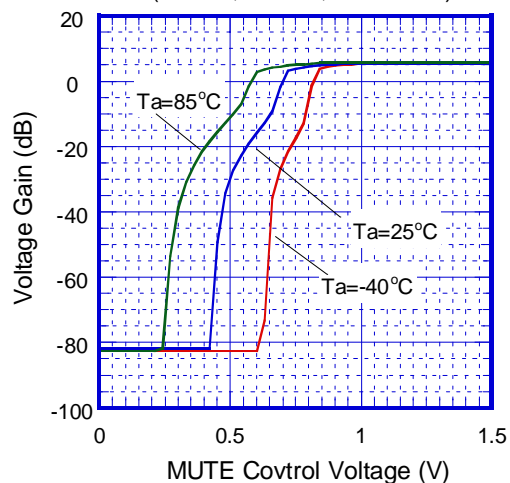
Channel Separation vs. Frequency  
( $V_+ = 5V, f = 1KHz, R_L = 32\Omega$ )



Ripple Rejection Ratio vs. Frequency  
( $V_{ripple} = -20dBV, R_L = 32\Omega$ )



Voltage Gain vs Mute Control Voltage  
( $V_+ = 5V, f = 1KHz, V_{in} = -6dBV$ )



**[CAUTION]**

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