

DUAL LOW VOLTAGE POWER AMPLIFIER

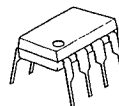
■ GENERAL DESCRIPTION

The NJM2076 is a dual power amplifier, which operates with 1.0V minimum supply voltage. The NJM2076 is suitable to small radio and head-phone of stereo and single BTL application.

■ FEATURES

- BTL operation $P_o \approx 90mW$ type.
- Minimum external components
- Headphone stereo Amp. with external transistors
- Low Operation Voltage (1.0V MIN.)
- Low Operating Current (4.7mA TYP.)
- Package Outline DIP8, DMP8, SIP9
- Bipolar Technology

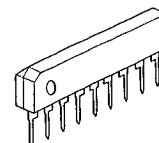
■ PACKAGE OUTLINE



NJM2076D

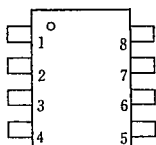


NJM2076M



NJM2076S

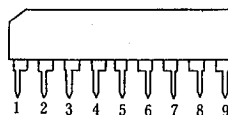
■ PIN CONFIGURATION



NJM2076D
NJM2076M

PIN FUNCTION

1. Inverting Amp. Input (A)
2. Non-Inverting Amp. Input(B)
3. V^+
4. Base(B)
5. (B) Output
6. GND
7. (A) Output
8. Base (A)



NJM2076S

PIN FUNCTION

1. V^+
2. Base (B)
3. (B) Output
4. Power GND
5. GND
6. (A) Output
7. Base (A)
8. Inverting Amp Input (A)
9. Non-Inverting Amp Input (B)

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	4.5	V
Maximum Input Signal	V _{IN}	200	mVrms
Power Dissipation	P _D	(DIP 8) 500 (SIP 9) 500 (DMP 8) 500	mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V⁺=1.5V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{cc}	Input: Open	—	4.7	7.0	mA

(I) Stereo Configuration (Test Circuit 1. R_L=16Ω)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Voltage Gain	A _v	V _{IN} =10mVrms	26.5	28.0	29.5	dB
Max. Output Power	P _{O1}	THD=10%(S-Type)	15	20.0	—	mW
	P _{O2}	THD=10%(D, M-Type)	15	17.5	—	mW
Total Harmonic Distortion	THD ₁	THD=10%, V ⁺ =1.0V P _O =1mW (126mVrms/16Ω)	—	3	—	mW
Output Noise Voltage	V _{NO1}	R _g =0, A Curve	—	50	150	μV
Ripple Rejection Ratio	RR ₁	R _g =0, f _R =1kHz, V _R =30mVrms	25	35	—	dB
Input Resistance	R _{IN}		25	33	43	kΩ
Output Pin Voltage	V _O (DC)		0.62	0.70	0.77	V

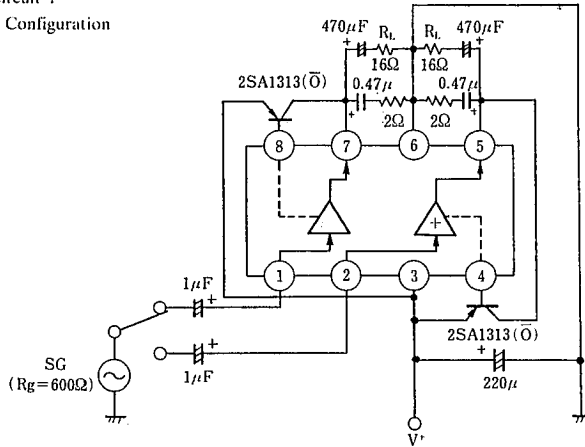
(II) BTL Configuration (Test Circuit 2. R_L=8Ω)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Max. Output power	P _{O3}	THD=10% (S-Type)	75	100	—	mW
	P _{O4}	THD=10% (D, M-Type)	75	90	—	mW
Total Harmonic Distortion	THD ₂	THD=10%, V ⁺ =1.0V (S-Type)	—	30	—	mW
		THD=10%, V ⁺ =1.0V (D, M-Type)	—	20	—	mW
Output Noise Voltage	V _{NO2}	P _O =10mW(283mVrms/8Ω) R _g =0, A Curve	—	1.5	4.5	μV
Ripple Rejection Ratio	RR ₂	R _g =0, f _R =1kHz, V _R =30mVrms	20	25	—	dB
Voltage Difference between Two Output Pins	ΔV _O (DC)		—	—	50	mV

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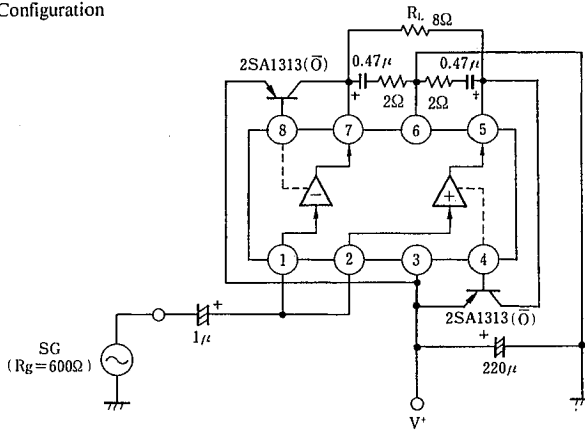
■ TEST CIRCUIT

· Test Circuit 1
Stereo Configuration



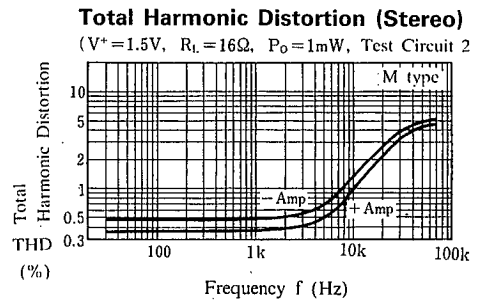
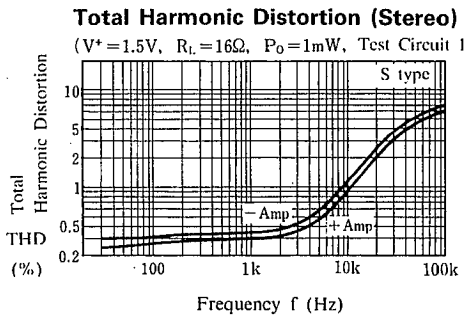
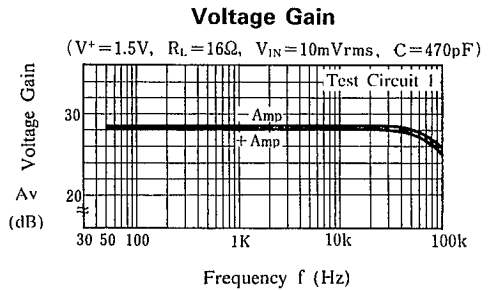
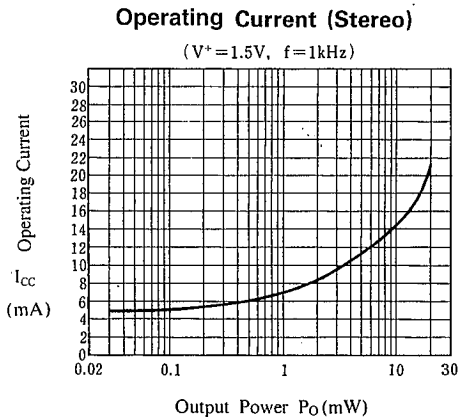
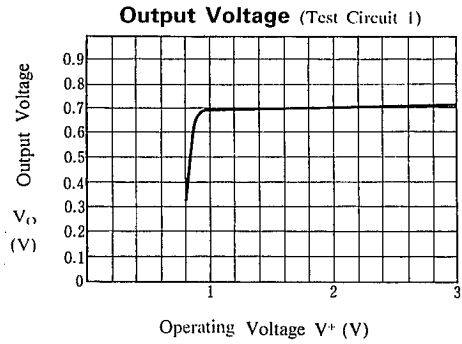
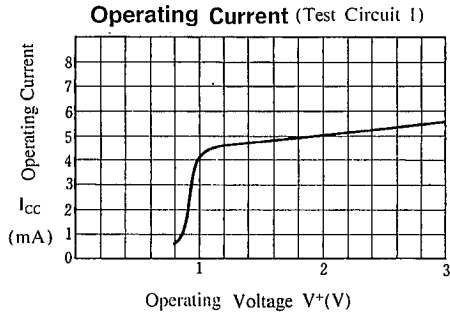
2SA1313(O): $h_{FE}=115\sim 125$
($I_c=100\text{mA}$)

· Test Circuit 2
BTL Configuration

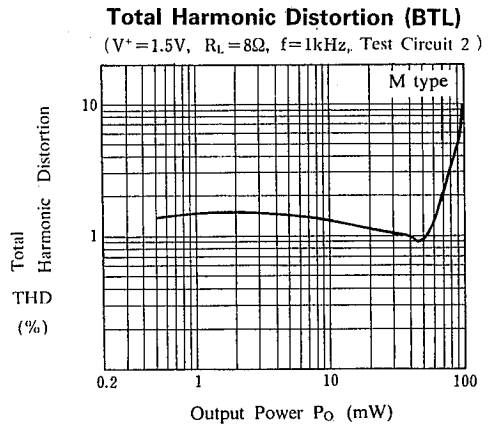
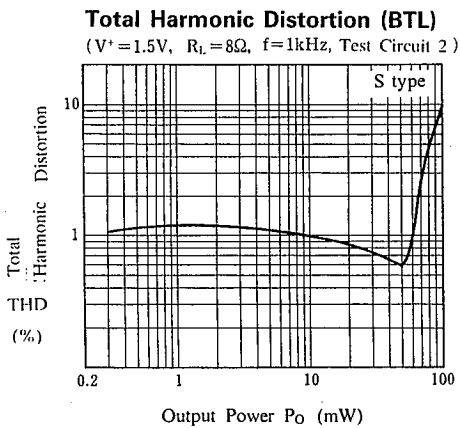
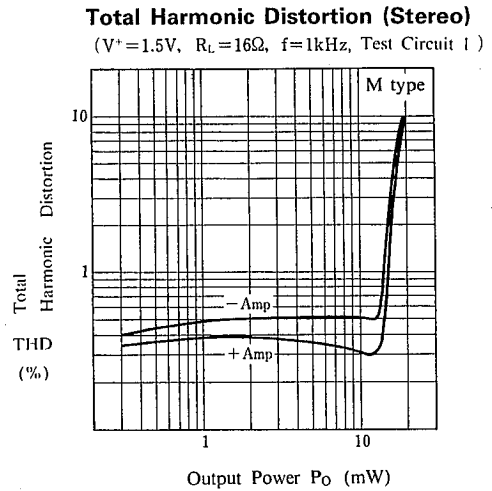
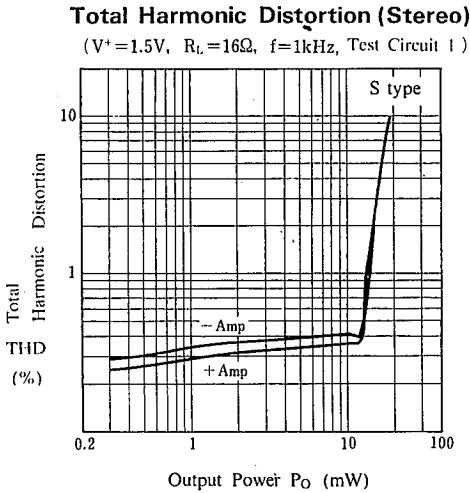
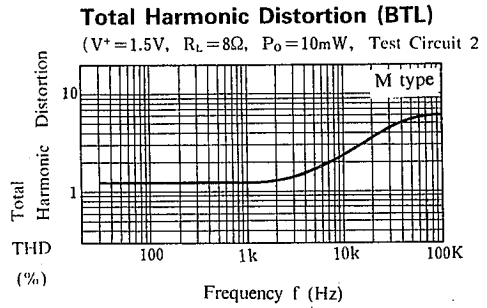
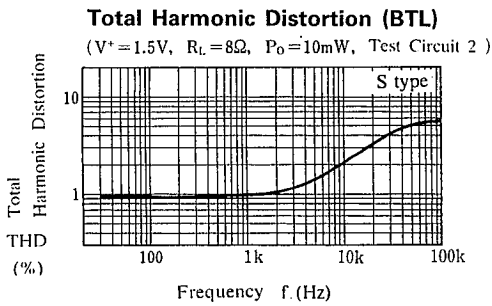


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■ TYPICAL CHARACTERISTICS

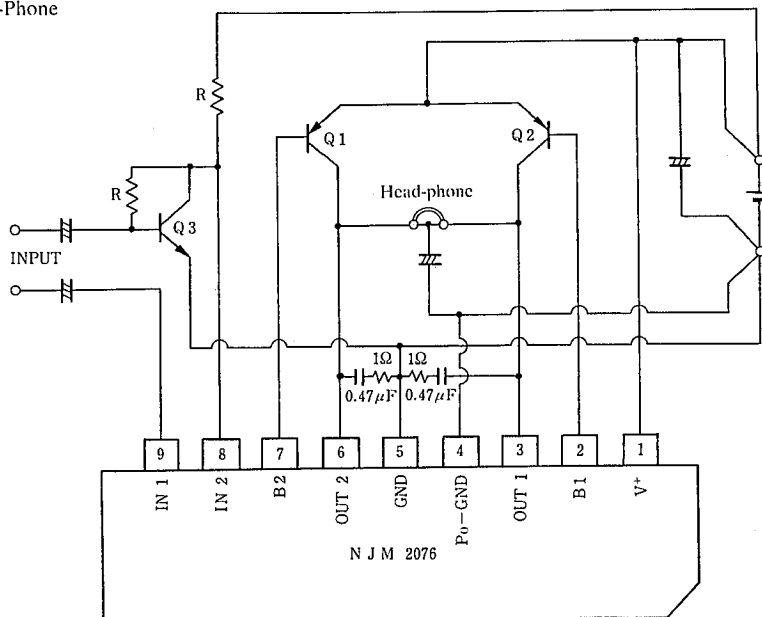


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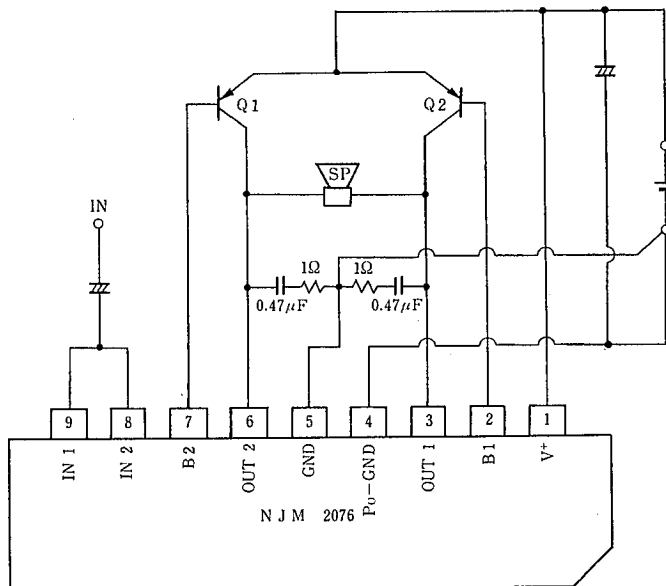


■ TYPICAL APPLICATION

1. For Stereo Head-Phone



2. BTL Amp. for Speaker



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■ NOTICE

(1) External PNP Transistor

Maximum output power becomes large with low saturation voltage transistor, and so select transistor of low saturation.
Saturation Voltage: less than 0.1V ($I_c=100\text{mA}$, $I_B=10\text{mA}$). $h_{FE}: 120$

(2) External Frequency Compensation

Recommend tantalum capacitor with low $\tan\delta$ (less than 0.25 at $f=10\text{kHz}$) and 1Ω resistor. Stable with large capacitor of less high frequency distortion and worse $\tan\delta$. For example: $1\mu\text{F}$, $\tan\delta \leq 0.6$

(3) Layout on PCB

Be careful to get maximum output power and low distortion set.

DIP/DMP: Signal ground has to be close to IC ground pin. Impedance of ground line must be low.

SIP: Two terminals (Power GND, GND) are connected at one point on PCB.

MEMO

[CAUTION]

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