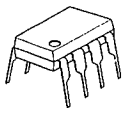
LOW VOLTAGE DUAL POWER AMPLIFIER

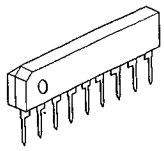
■ GENERAL DESCRIPTION

The NJM2096 is a dual power amplifier, which operates with 1.0V minimum supply voltage. The NJM2096 is suitable to small radio and head-phone stereo. The NJM2096 is resemble to the NJM2076, but two amplifiers are the same.

■ PACKAGE OUTLINE



NJM2096D



NJM2096S

NJM2096M

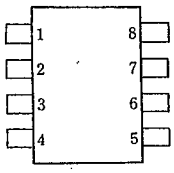
■ FEATURES

- Low Operating Voltage (1.0V min)
- Minimum external components
- Low Operating Current
- Package Outline DIP8, DMP8, SIP9
- Bipolar Technology

■ APPLICATION

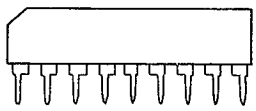
- Head-phone Stereo, Portable Radio, Portable TV, Hand-carry Tele-communication Set.

■ PIN CONFIGURATION



NJM2096D
NJM2096M

PIN FUNCTION
1. Non-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)



NJM2096S

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

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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

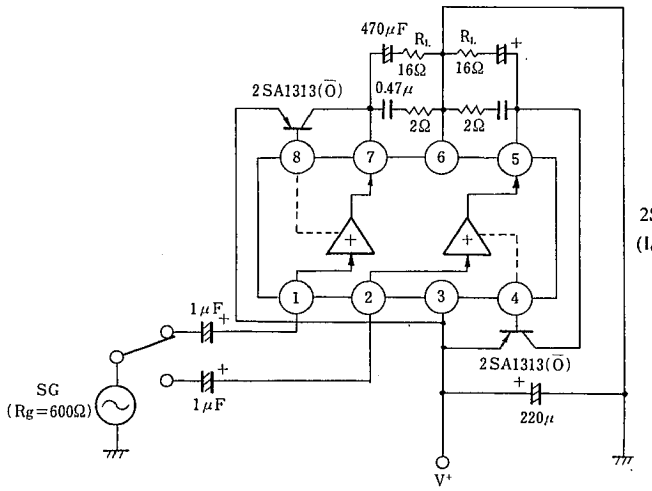
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	4.5	V
Power Dissipation	P_D	(DIP8) 500 (SIP9) 500 (DMP8) 300	mW
Maximum Input Signal	V_{IN}	200	mVrms
Operating Temperature Range	T_{opr}	−20～+75	℃
Storage Temperature Range	T_{stg}	−40～+125	℃

■ ELECTRICAL CHARACTERISTICS

(Ta=25℃, V^+=1.5V. R_L=16Ω)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{cc}	V_{IN}=Open	—	4.7	7	mA
Maximum Output Power	P_{OI}	THD=10% D&S	15	20	—	mW
		M	15	17.5	—	mW
Max. Output Power at Low Supply Voltage	P_O	THD=10%, V^+= 1.0V	—	3	—	mW
Voltage Gain	Av	V_{IN}=10mVrms	26.5	28	29.5	dB
Total Harmonic Distortion	THD	P_O=1mW	—	0.4	0.8	%
Ripple Rejection Ratio	RR	Rg=0Ω, V_r =30mVrms. F_r =1kHz	25	35	—	dB
Input Resistance	R_{IN}		25	33	43	kΩ
Output Noise Voltage	V_{NO}	Rg=0Ω, A Curve	—	40	150	μV
Output Pin Voltage	V_O (DC)		0.62	0.70	0.77	V
Voltage Difference between Two Output Pins	ΔV_O(DC)		—	—	50	mV

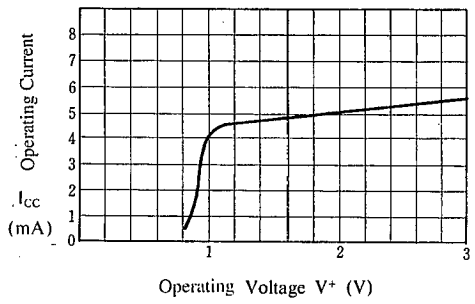
■ TEST CIRCUIT



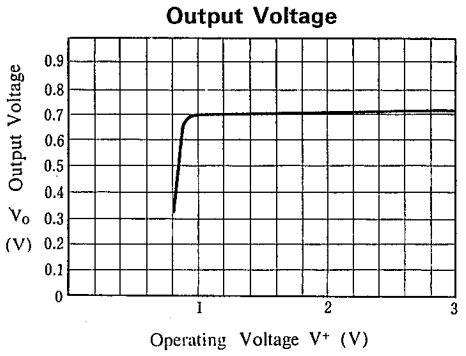
2SA1313 (Ō) : h_{FE}=115～125
(I_C=100mA)

■ TYPICAL CHARACTERISTICS

Operating Current

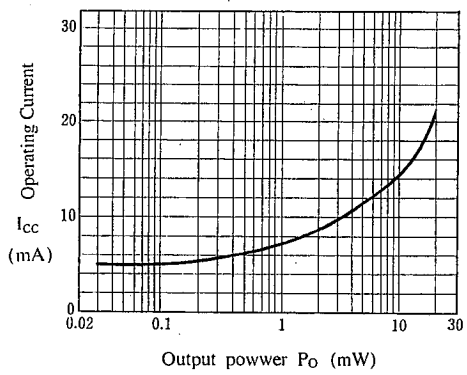


Output Voltage



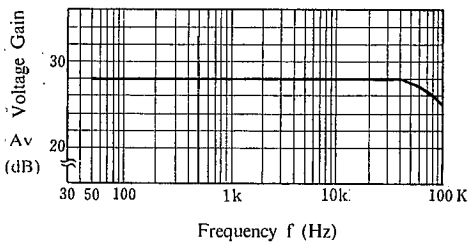
Operating Current

(V+=1.5 V, f=1 kHz)



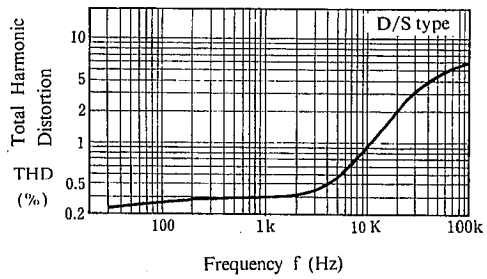
Voltage Gain

(V+=1.5 V, R_L=16Ω, V_{IN}=10 mVrms, C=470 pF)



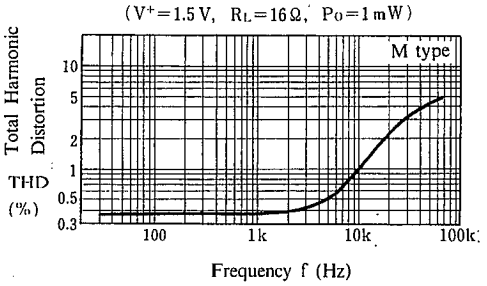
Total Harmonic Distortion

(V+1.5 V, R_L=16Ω, P_O=1 mW)



Total Harmonic Distortion

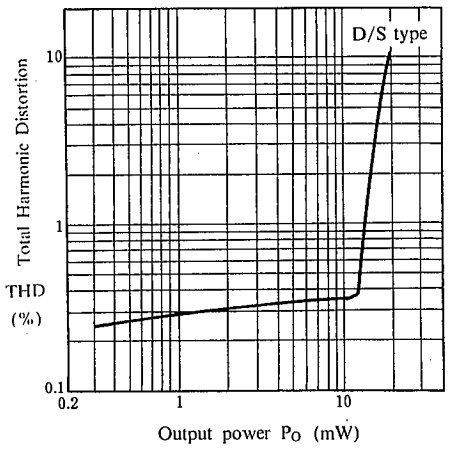
(V+=1.5 V, R_L=16Ω, P_O=1 mW)



■ TYPICAL CHARACTERISTICS

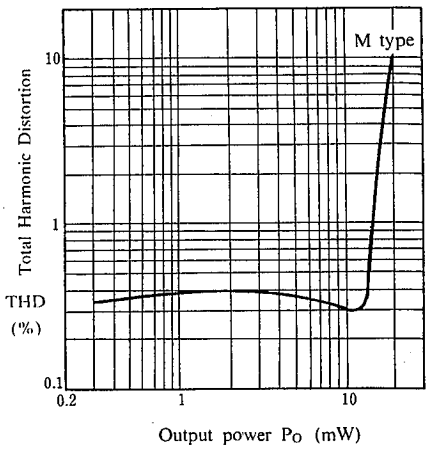
Total Harmonic Distortion

(V^+=1.5V, R_L=16Ω, f=1kHz)



Total Harmonic Distortion

(V^+=1.5V, R_L=16Ω, f=1kHz)



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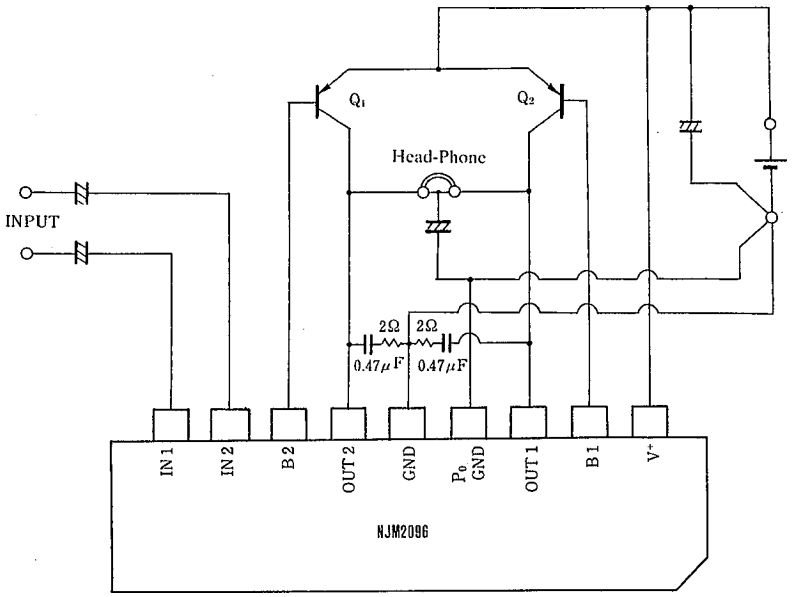
■ TYPICAL APPLICATION

Stereo Head-Phone



■ NOTICE

(1) External PNP Transistor

Maximum output power becomes large with low saturation voltage transistor, and so select transistor of low saturation voltage.

h_{FE}: 120

(2) External Frequency Compensation

Recommend tantalum capacitor with low tan δ (less than 0.25 at f=10kHz) and 2Ω resistor. Stable with large capacitor of less high frequency distortion and worse tanδ. For example: 1μF, tanδ≦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