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New Japan Radio Co.,Ltd.

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## 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.

### ■ FEATURES

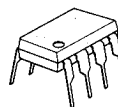
- Low Operating Voltage (1.0V min)
- Minimum external components
- Low Operating Current
- Package Outline DIP8, DMP8
- Bipolar Technology

### ■ APPLICATION

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

### ■ PIN CONFIGURATION

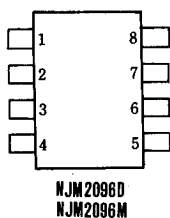
### ■ PACKAGE OUTLINE



NJM 2096 D



NJM 2096 M



#### PIN FUNCTION

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

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

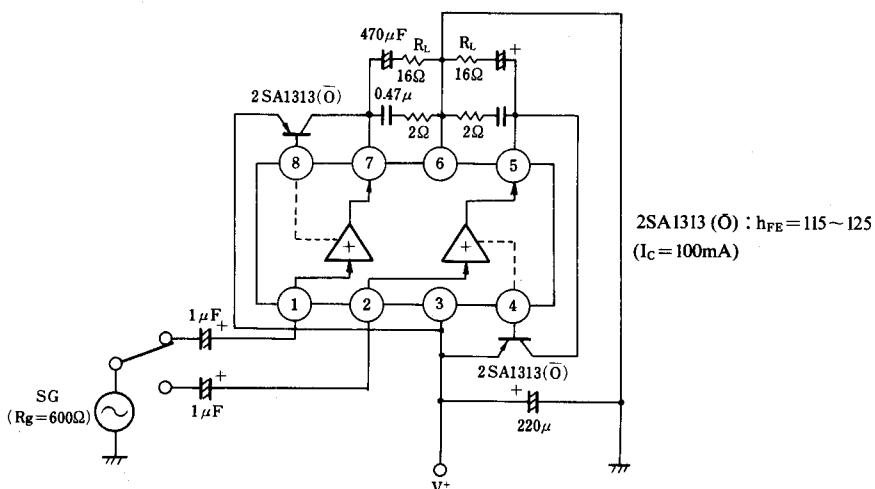
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	4.5	V
Power Dissipation	P <sub>D</sub>	(DIP8) 500 (DMP8) 300	mW
Maximum Input Signal	V <sub>IN</sub>	200	mVrms
Operating Temperature Range	T <sub>opr</sub>	-20~+75	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C

## ■ ELECTRICAL CHARACTERISTICS

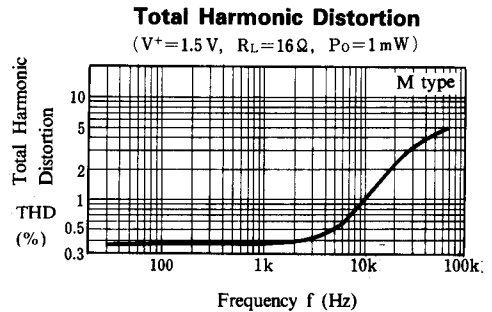
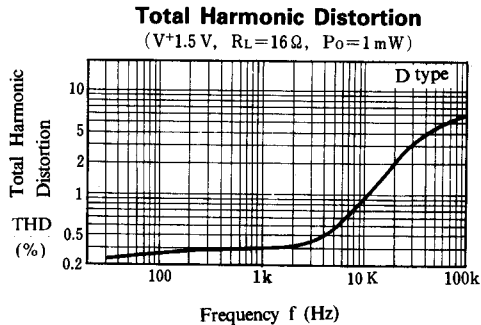
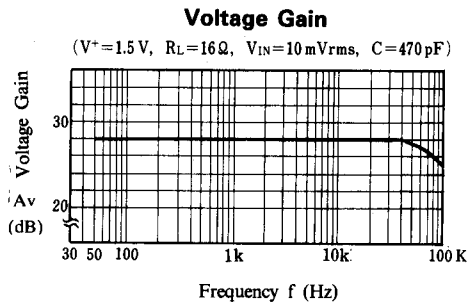
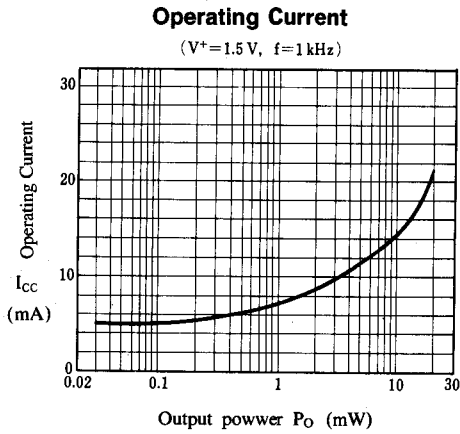
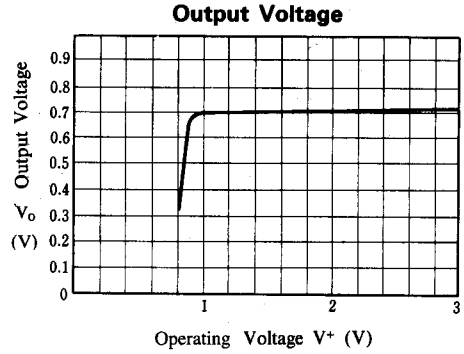
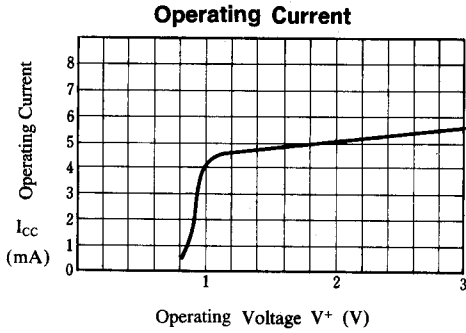
(Ta=25°C, V\*=1.5V, R<sub>L</sub>=16Ω)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I <sub>cc</sub>	V <sub>IN</sub> =Open	—	4.7	7	mA
Maximum Output Power	P <sub>OI</sub>	THD=10% D M	15	20	—	mW
Max. Output Power at Low Supply Voltage	P <sub>O</sub>	THD=10%, V* = 1.0V	—	3	—	mW
Voltage Gain	A <sub>v</sub>	V <sub>IN</sub> =10mVrms	26.5	28	29.5	dB
Total Harmonic Distortion	THD	P <sub>O</sub> =1mW	—	0.4	0.8	%
Ripple Rejection Ratio	RR	R <sub>g</sub> =0Ω, V <sub>r</sub> =30mVrms, F <sub>r</sub> =1kHz	25	35	—	dB
Input Resistance	R <sub>IN</sub>		25	33	43	kΩ
Output Noise Voltage	V <sub>NO</sub>	R <sub>g</sub> =0Ω, A Curve	—	40	150	μV
Output Pin Voltage	V <sub>O</sub> (DC)		0.62	0.70	0.77	V
Voltage Difference between Two Output Pins	ΔV <sub>O</sub> (DC)		—	—	50	mV

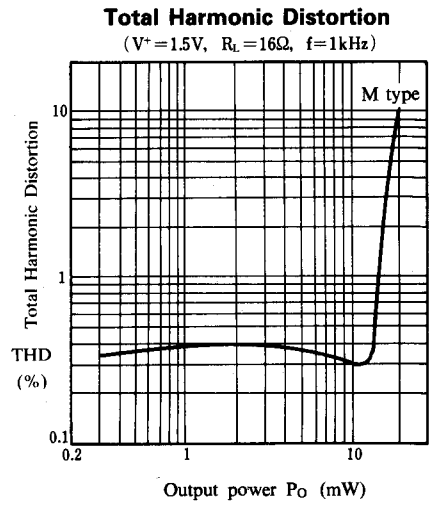
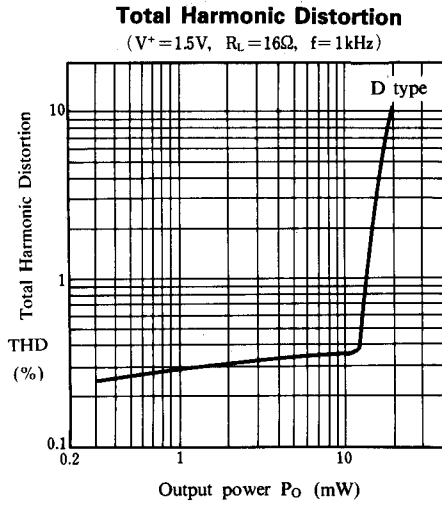
## ■ TEST CIRCUIT



## ■ TYPICAL CHARACTERISTICS

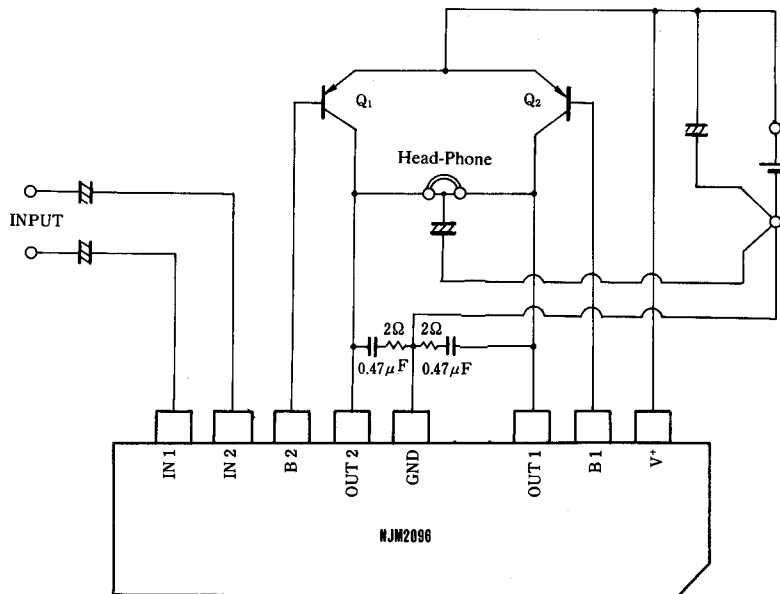


## ■ TYPICAL CHARACTERISTICS



## ■ 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.  
 hFF: 120

### (2) External Frequency Compensation

Recommend tantalum capacitor with low  $\tan \delta$  (less than 0.25 at  $f=10\text{kHz}$ ) and 2Ω 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.

## MEMO

[CAUTION]

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