

■ Electrical Characteristics (Ta=25°C)

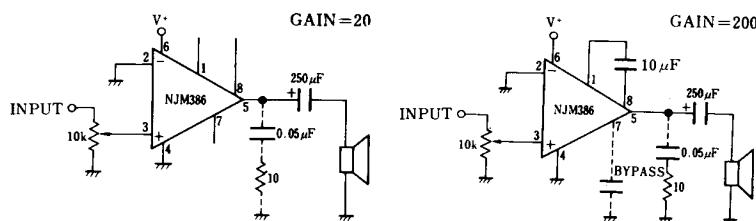
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V ⁺		4	—	12	V
Supply Current	I _{CC}	V ⁺ =6V, V _{IN} =0	—	3	8	mA
Output Power (note 2)	P _o	V ⁺ =6V, R _L =8Ω, THD=10%	250	325	—	mW
		V ⁺ =9V, R _L =16Ω, THD=10%	—	500	—	mW
Voltage Gain	A _V	V ⁺ =6V, f=1kHz	24	26	28	dB
		10μF from Pin 1 to 8	43	46	49	dB
Bandwidth	BW	V ⁺ =6V, Pins 1 and 8 Open	—	300	—	kHz
Total Harmonic Distortion	THD	V ⁺ =6V, R _L =8Ω, P _{OUT} =125mW	—	0.2	—	%
		f=1kHz, Pins 1 and 8 open	—	—	—	
Power Supply Rejection Ratio	SVR	V ⁺ =6V, f=1kHz, C _{BYPASS} =10μF	—	50	—	dB
		Pins 1 and 8 Open	—	—	—	
Input Resistance	R _{IN}		—	50	—	kΩ
Input Bias Current	I _B	V ⁺ =6V, Pins 2 and 3 Open	—	250	—	nA

(note 1) Set the maximum junction temperature to 125°C and reduce the thermal resistance to 143°C/W when the ambient temperature is high.

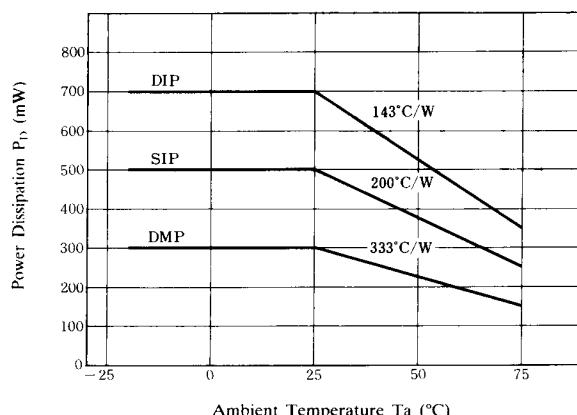
(note 2) Insert a 10Ω resistor and an 0.05μF capacitor in series to the ground terminal from pin 5.

■ Typical Application

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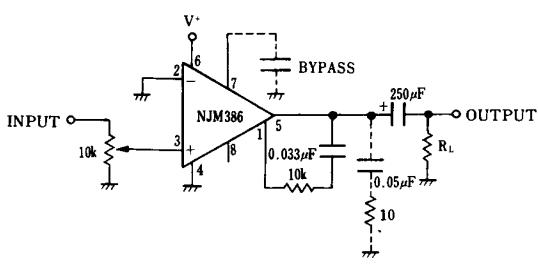


■ Power Dissipation vs. Ambient Temperature

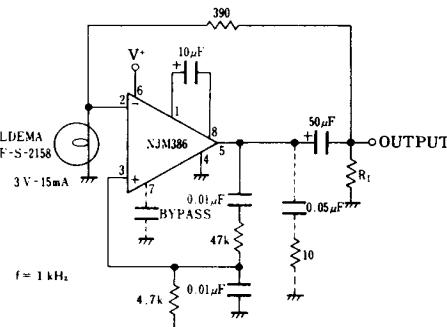


■ Typical Applications

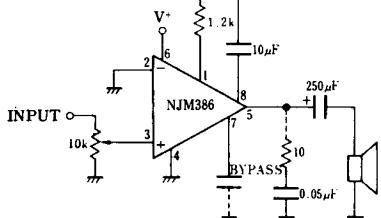
Amplifier with Bass Boost



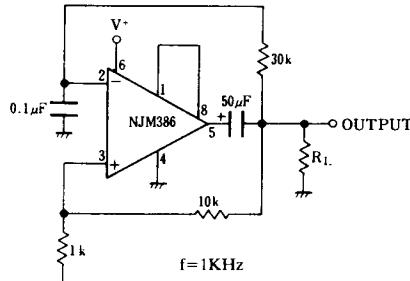
Low Distortion Power Wienbridge Oscillator



Amplifier 2



Square Wave Oscillator



Application Hints

GAIN CONTROL

To make the NJM386 a more versatile amplifier, two pins (1 and 8) are provided for gain control. With pins 1 and 8 open the $1.35k\Omega$ resistor sets the gain at 20 (26dB). If a capacitor is put from pin 1 to 8, bypassing the $1.35k\Omega$ resistor, the gain will go up to 200 (46 dB). If a resistor is placed in series with the capacitor, the gain can be set to any value from 20 to 200. Gain control can also be done by capacitively coupling a resistor (or FET) from pin 1 to ground.

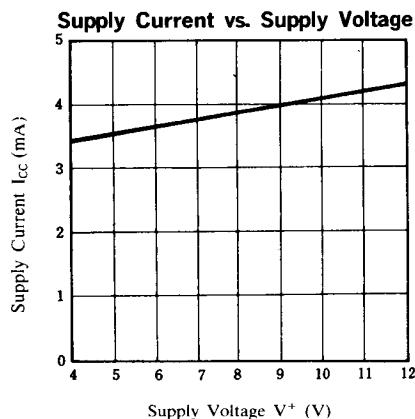
Additional external components can be placed in parallel with the internal feedback resistors to tailor the gain and frequency response for individual applications. For example, we can compensate poor speaker bass response by frequency shaping the feedback path. This is done with a series RC from pin 1 to 5 (paralleling the internal $15 k\Omega$ resistor). For 6 dB effective bass boost: $R \cong 15k\Omega$, the lowest value for good stable operation is $R_{MIN} = 10k\Omega$ if pin 8 is open. If pins 1 and 8 are bypassed then R as low as $2k\Omega$ can be used. This restriction is because the amplifier is only compensated for closed-loop gains greater than 9.

INPUT BIASING

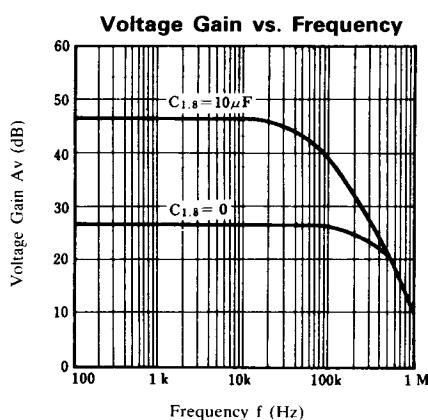
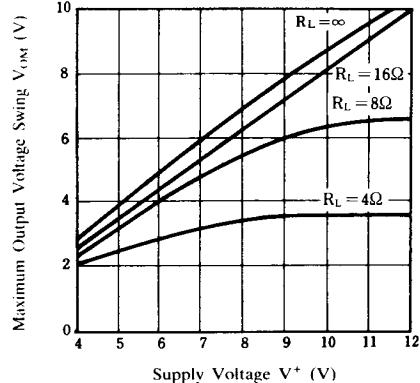
The schematic shows that both inputs are biased to ground with a $50k\Omega$ resistor. The base current of the input transistors is about 250 nA , so the inputs are at about 12.5 mV when left open. If the dc source resistance driving the NJM386 is higher than $250k\Omega$ it will contribute very little additional offset (about 2.5 mV at the input, 50 mV at the output). If the dc source resistance is less than $10k\Omega$, then shorting the unused input to ground will keep the offset low (about 2.5 mV at the input, 50 mV at the output). For dc source resistances between these values we can eliminate excess offset by putting a resistor from the unused input to ground, equal in value to the dc source resistance. Of course all offset problems are eliminated if the input is capacitively coupled.

When using the NJM386 with higher gains (bypassing the $1.35 k\Omega$ resistor between pins 1 and 8) it is necessary to bypass the unused input, preventing degradation of gain and possible instabilities. This is done with a $0.1\mu\text{F}$ capacitor or a short to ground depending on the dc source resistance on the driven input.

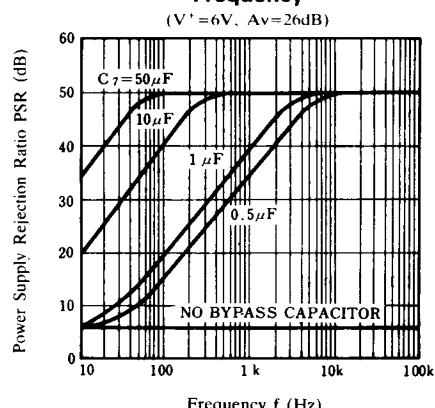
■ Typical Characteristics ($T_a=25^\circ\text{C}$)



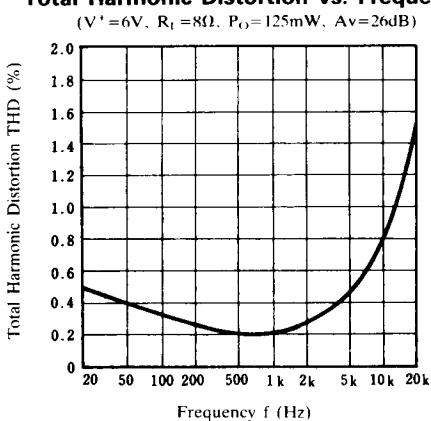
Maximum Output Voltage Swing vs. Supply Voltage



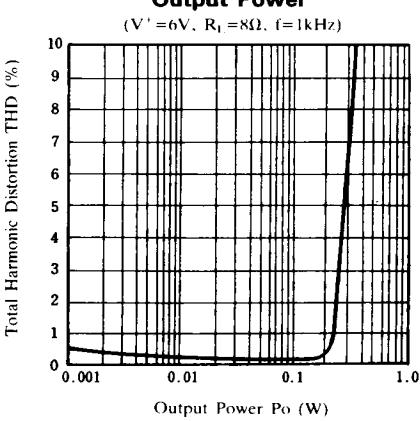
Power Supply Rejection Ratio vs. Frequency



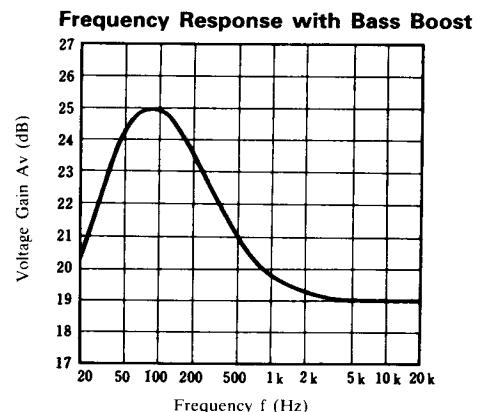
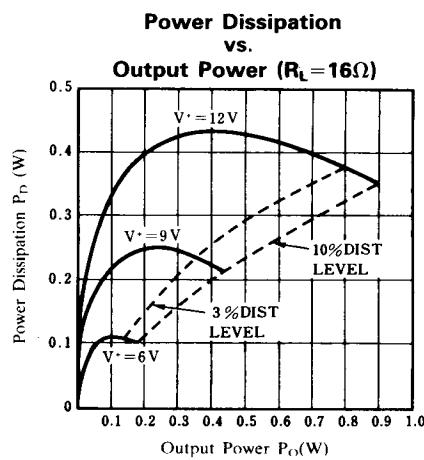
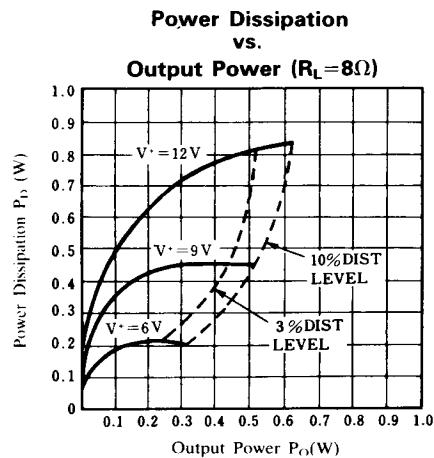
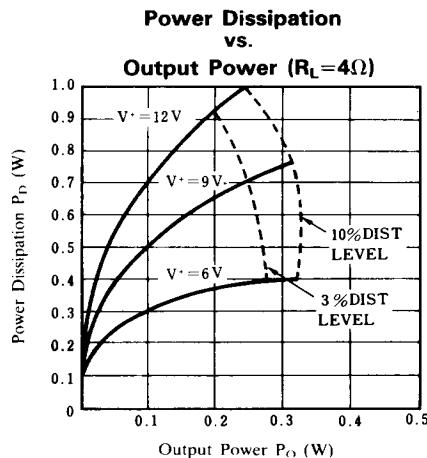
Total Harmonic Distortion vs. Frequency



Total Harmonic Distortion vs. Output Power



■ Typical Characteristics (Ta=25°C)



(In regard to Test Circuit.
Please refere to
Typical Application
"Amplifier with Bass Boost")