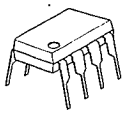
DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

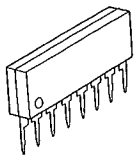
The NJM4560 integrated circuit is a high-gain, wide-bandwidth, dual operational amplifier capable of driving 20V peak-to-peak into 400Ω loads.The NJM4560 combines many of the features of the NJM4558 as well as providing the capability of wider bandwidth, and higher slew rate make the NJM4560 ideal for active filters, data and telecommunications, and many instrumentation applications. The availability of the NJM4560 in the surface mounted micro-package allows the NJM4560 to be used in critical applications requiring very high packing densities.

■ PACKAGE OUTLINE



NJM4560D

NJM4560M

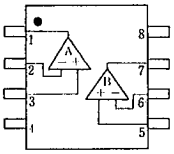


NJM4560L

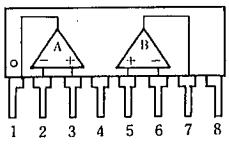
■ FEATURES

- Operating Voltage (±4V～±18V)
- Wide Gain Bandwidth Product (10MHz typ.)
- Slew Rate (4V/μs typ.)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

■ PIN CONFIGURATION



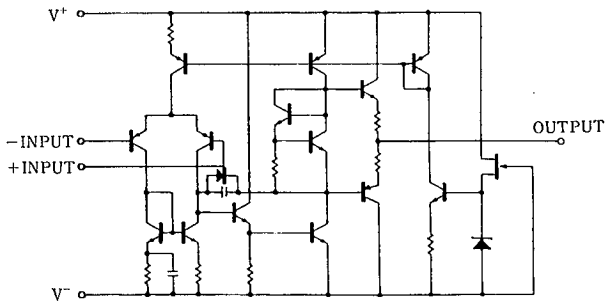
NJM4560D
NJM4560M



NJM4560L

PIN FUNCTION
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±18	V
Differential Input Voltage	V_{ID}	±30	V
Input Voltage	V_{IC}	±15 (note)	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
		(SIP8) 800	mW
Operating Temperature Range	T_{opr}	−20~+75	℃
Storage Temperature Range	T_{stg}	−40~+125	℃

(note) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

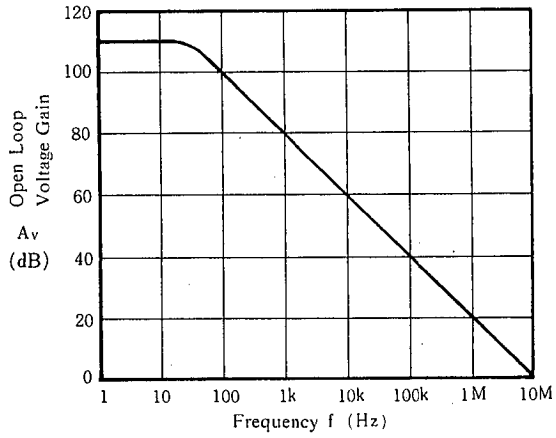
(Ta=25℃, V^+/V^-=±15V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	R_S≦10kΩ	—	0.5	6	mV
Input Offset Current	I_{IO}		—	5	200	nA
Input Bias Current	I_B		—	40	500	nA
Input Resistance	R_{IN}		0.3	5	—	MΩ
Large Signal Voltage Gain	A_V	R_L≧2kΩ, V_O=±10V	86	100	—	dB
Maximum Output Voltage 1	V_{OM1}	R_L≧2kΩ	±12	±14	—	V
Maximum Output Voltage 2	V_{OM2}	I_O=25mA	±10	±11.5	—	V
Input Common Mode Voltage Range	V_{ICM}		±12	±14	—	V
Common Mode Rejection Ratio	CMR	R_S≦10kΩ	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	R_S≦10kΩ	76.5	90	—	dB
Operating Current	I_{CC}		—	4.3	5.7	mA
Slew Rate	SR		—	4	—	V/μs
Gain Bandwidth Product	GB		—	10	—	MHz
Equivalent Input Noise Voltage	V_{NI}	RIAA, R_S=2kΩ, 30kHz LPF	—	1.2	—	μV_{rms}

■ TYPICAL CHARACTERISTICS

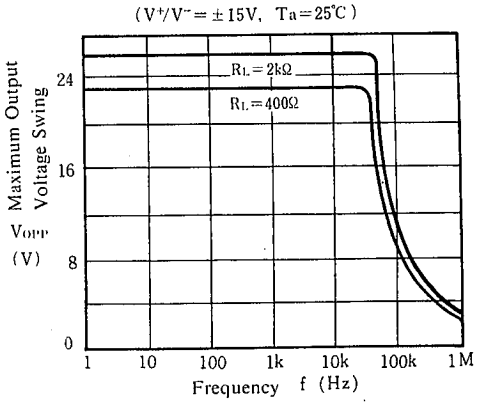
Open Loop Voltage Gain vs. Frequency

($V^+/V^-=\pm15V$, $R_L=2k\Omega$, $Ta=25°C$)



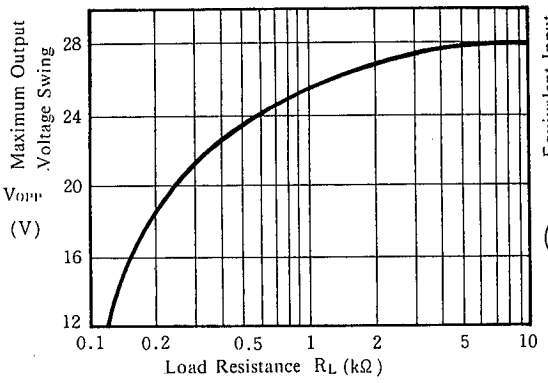
Maximum Output Voltage Swing vs. Frequency

($V^+/V^-=\pm15V$, $Ta=25°C$)



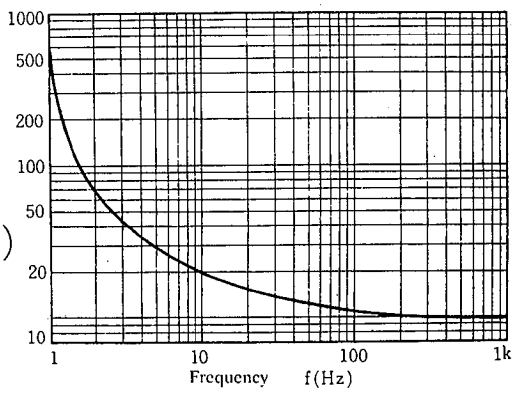
Maximum Output Voltage Swing vs. Load Resistance

($V^+/V^-=\pm15V$, $Ta=25°C$)



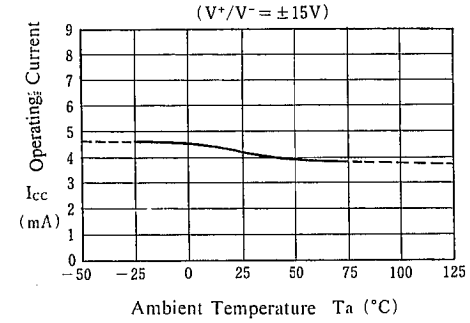
Equivalent Input Noise Voltage vs. Frequency

($V^+/V^-=\pm15V$, $Rs=50\Omega$, $Av=60dB$, $Ta=25°C$)



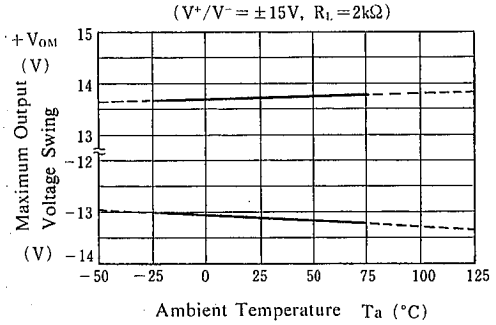
Operating Current vs. Temperature

($V^+/V^-=\pm15V$)



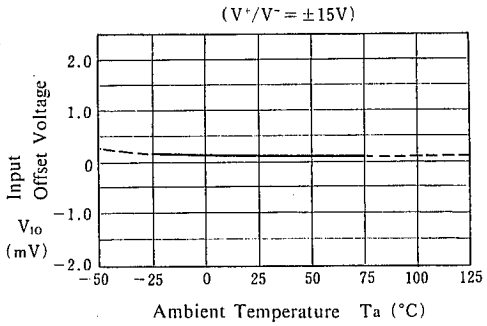
Maximum Output Voltage Swing vs. Temperature

($V^+/V^-=\pm15V$, $R_L=2k\Omega$)

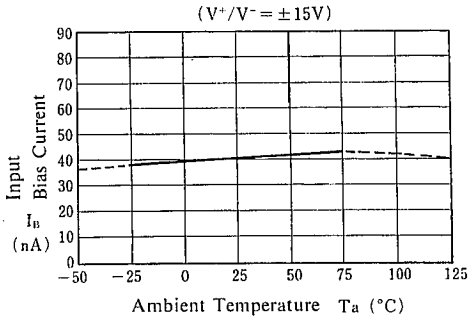


■ TYPICAL CHARACTERISTICS

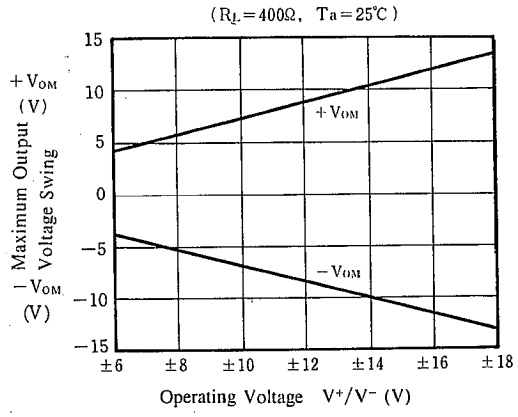
Input Offset Voltage vs. Temperature



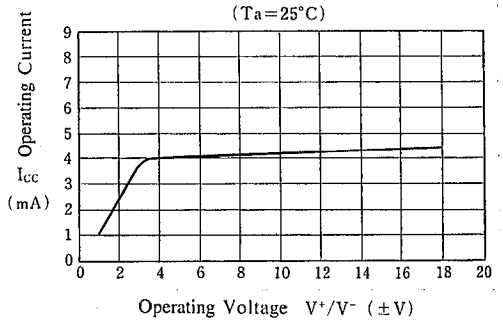
Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Supply Voltage



Operating Current vs. Operating Voltage



MEMO