

DUAL LOW POWER OPERATIONAL AMPLIFIER

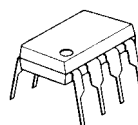
■ GENERAL DESCRIPTION

The NJM022 is a dual low-power operational amplifier which was designed to replace higher-power devices in many applications without sacrificing system performance. High input impedance, low supply currents, and low equivalent input noise voltage over a wide range of operating supply voltages result in an extremely versatile operational amplifier for use in a variety of analog applications including battery operated circuit. Internal frequency compensation, absence of latch-up, high slew rate, and short-circuit protection assure ease of use.

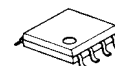
■ FEATURES

- Operating Voltage ($\pm 2V \sim \pm 18V$)
- Low Operating Current ($130\mu A$ typ.)
- Slew Rate ($0.5V/\mu s$ typ.)
- Short-Circuit Protection
- Package Outline DIP8, DMP8, SSOP8, SIP8
- Bipolar Technology

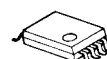
■ PACKAGE OUTLINE



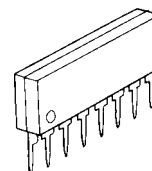
NJM022D



NJM022M

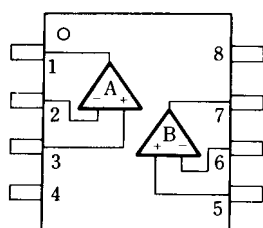


NJM022V



NJM022L

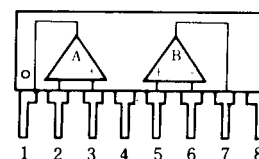
■ PIN CONFIGURATION



NJM022D
NJM022M
NJM022V

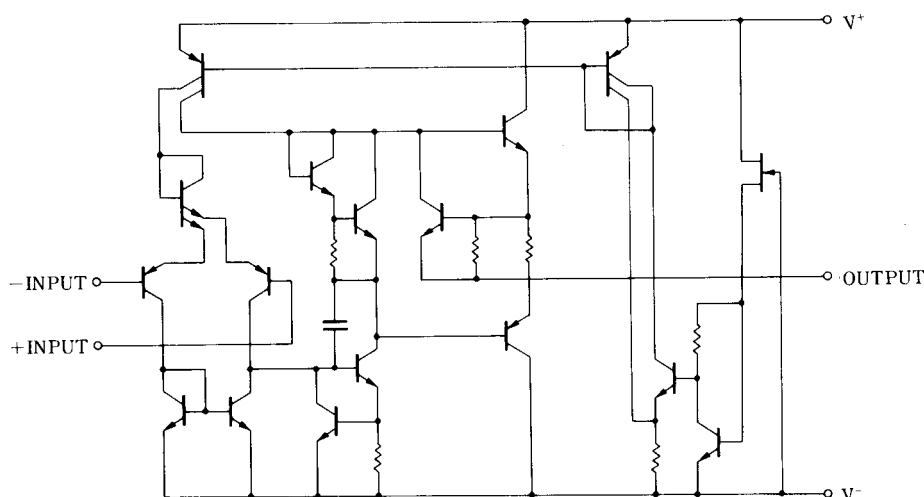
PIN FUNCTION

- 1. A OUTPUT
- 2. A -INPUT
- 3. A +INPUT
- 4. V^-
- 5. B +INPUT
- 6. B -INPUT
- 7. B OUTPUT
- 8. V^+



NJM022L

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+ / V^-	± 18	V
Input Voltage	V_{IC}	± 15	V
Differential Input Voltage	V_{ID}	± 30	V
Power Dissipation	P_D	(DIP8) 500 (DMP8) 300 (SSOP8) 300 (SIP8) 800	mW
Operating Temperature Range	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-40~+125	°C

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

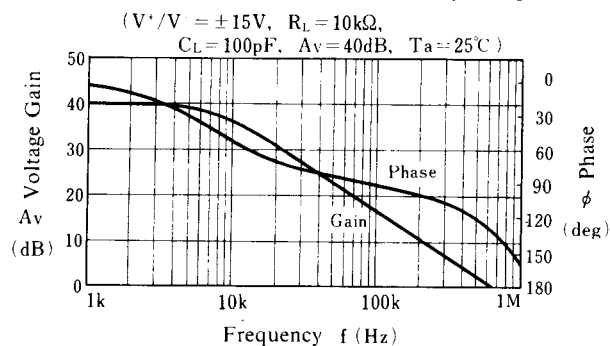
■ ELECTRICAL CHARACTERISTICS

(Ta=+25°C, $V^+ / V^- = \pm 15V$)

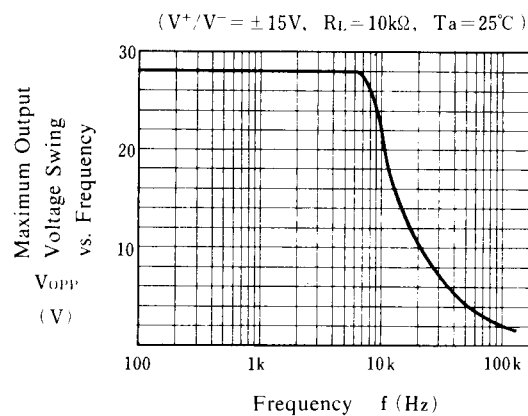
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_S \leq 10k\Omega$	-	1	5	mV
Input Offset Current	I_{IO}		-	1	80	nA
Input Bias Current	I_{IB}		-	15	250	nA
Large Signal Voltage Gain	A_V	$R_L \geq 10k\Omega, V_O = \pm 10V$	60	88	-	dB
Common Mode Rejection Ratio	CMR	$R_S \leq 10k\Omega$	60	90	-	dB
Response Time (Rise Time)	t_R	$V_{IN} = 20mV, R_L = 10k\Omega, C_L = 100pF$	-	0.3	-	μs
Slew Rate	SR	$V_{IN} = 10V, R_L = 10k\Omega, C_L = 100pF$	-	0.5	-	V/ μs
Input Common Mode Voltage Range	V_{ICM}		± 12	± 13	-	V
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10k\Omega$	74	110	-	dB
Equivalent Input Noise Voltage	V_{NI}	$A_V = 20dB, f = 1kHz$	-	50	-	nV/ $\sqrt{Hz}$
Short-circuit Output Current	I_{OS}		-	± 6	-	mA
Operating Current	I_{CC}		-	130	250	μA
Maximum Peak-to-peak Output Voltage Swing	V_{OM}	$R_L = 10k\Omega$	± 10	± 14	-	V

■ TYPICAL CHARACTERISTICS

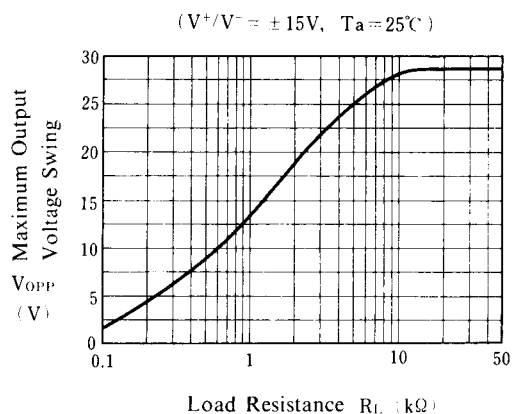
Voltage Gain, Phase vs. Frequency



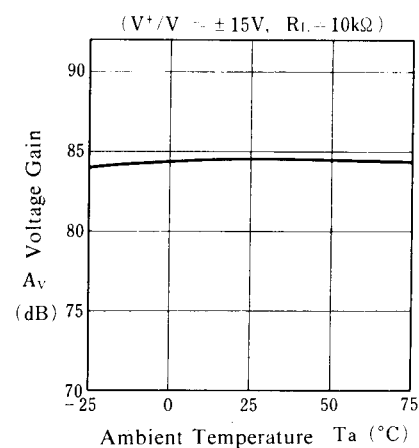
Maximum Output Voltage Swing vs. Frequency



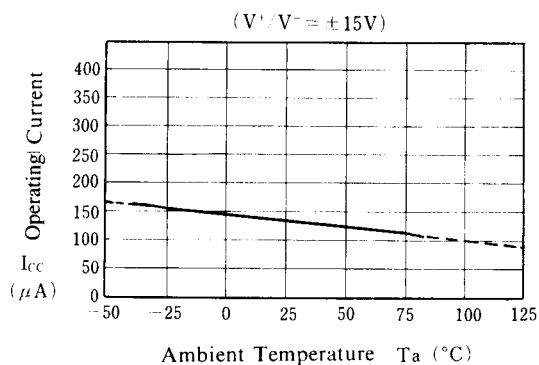
Maximum Output Voltage Swing vs. Load Resistance



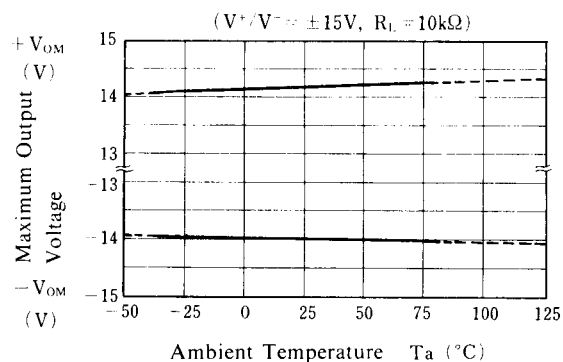
Voltage Gain vs. Temperature



Operating Current vs. Temperature

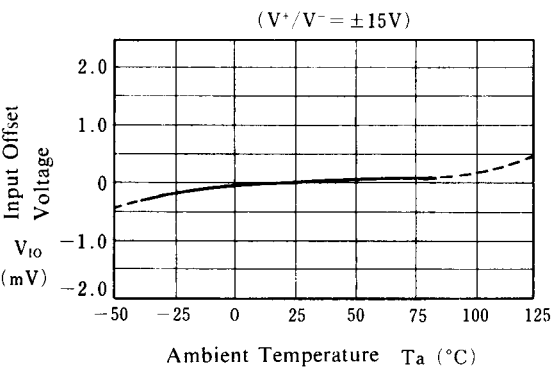


Maximum Output Voltage vs. Temperature

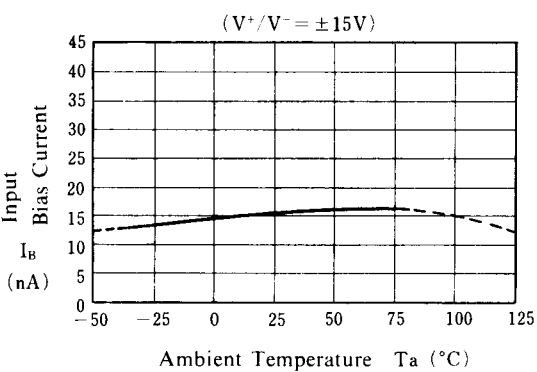


■ TYPICAL CHARACTERISTICS

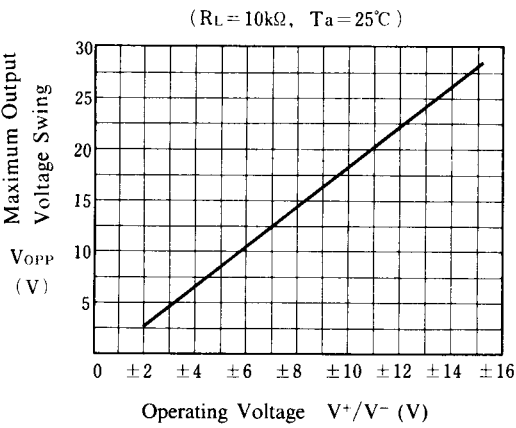
Input Offset Voltage vs. Temperature



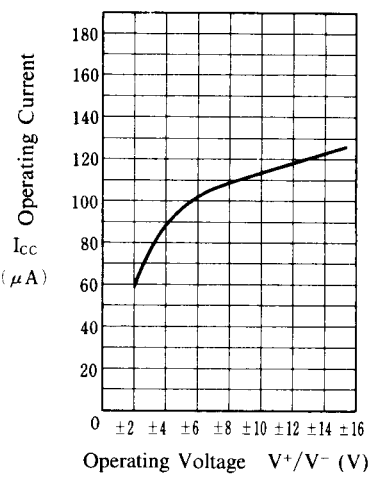
Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Operating Voltage



Operating Current vs. Operating Voltage



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