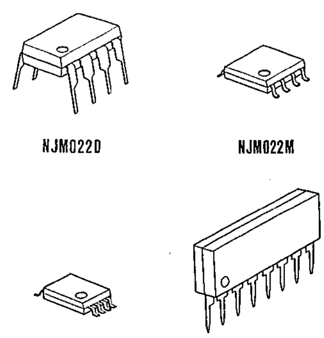
DUAL LOW POWER OPERATIONAL AMPLIFIER

■ 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.

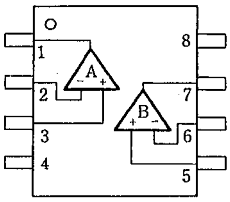
■ PACKAGE OUTLINE



■ FEATURES

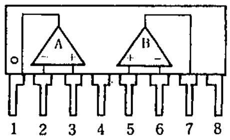
- Operating Voltage (±2V ~ ±18V)
- Low Operating Current (130 μAtyp.)
- Slew Rate (0.5V/ μs typ.)
- Short-Circuit Protection
- Package Outline DIP8, DMP8, SSOP8, SIP8
- Bipolar Technology

■ PIN CONFIGURATION



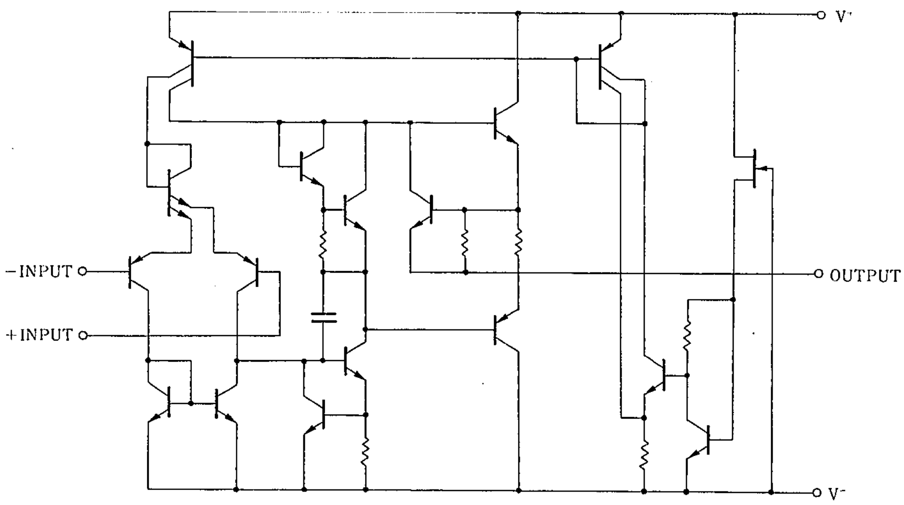
PIN FUNCTION
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

NJM022D
NJM022M
NJM022V



NJM022L

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

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	mW
		(DMP8) 300	mW
		(SSOP8) 300	mW
		(SIP8) 800	mW
Operating Temperature Range	T_{opr}	−40～+85	℃
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	—	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≧10kΩ, V_O=±10V	60	88	—	dB
Common Mode Rejection Ratio	CMR	R_S≦10kΩ	60	90	—	dB
Response Time (Rise Time)	t_R	V_{IN}=20mV, R_L=10kΩ, C_L=100pF	—	0.3	—	μs
Slew Rate	SR	V_{IN}=10V, R_L=10kΩ, C_L=100pF	—	0.5	—	V/μs
Input Common Mode Voltage Range	V_{ICM}		±12	±13	—	V
Supply Voltage Rejection Ratio	SVR	R_S≦10kΩ	74	110	—	dB
Equivalent Input Noise Voltage	V_{NI}	A_V=20dB, f=1kHz	—	50	—	nV/√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 =10kΩ	±10	±14		V

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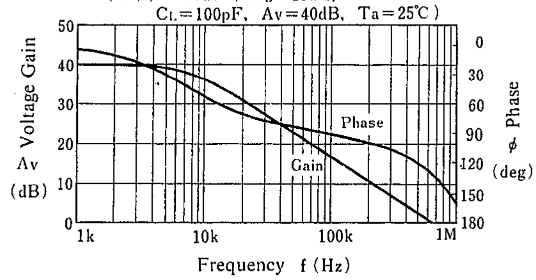
■ **TYPICAL CHARACTERISTICS**

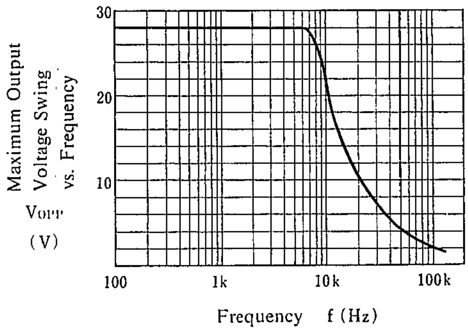
Voltage Gaim, Phase vs. Frequency

(V+/V− = ±15V, RL = 10kΩ, CL = 100pF, Av = 40dB, Ta = 25℃)



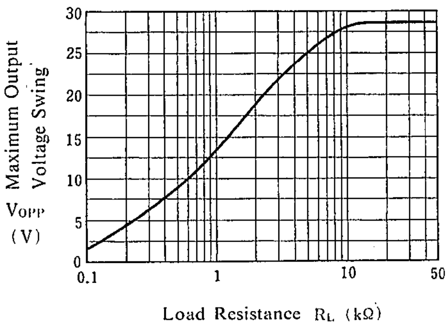
Maximum Output Voltage Swing vs. Frequency

(V+/V− = ±15V, RL = 10kΩ, Ta = 25℃)



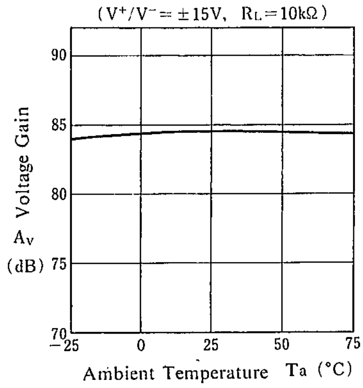
Maximum Output Voltage Swing vs. Load Resistance

(V+/V− = ±15V, Ta = 25℃)



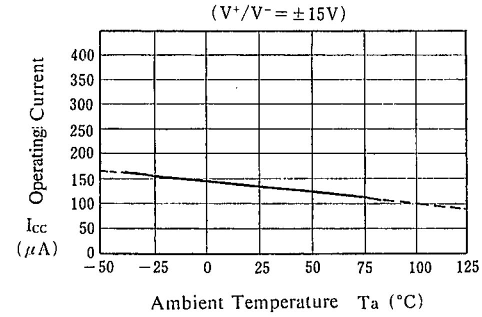
Voltage Gain vs. Temperature

(V+/V− = ±15V, RL = 10kΩ)



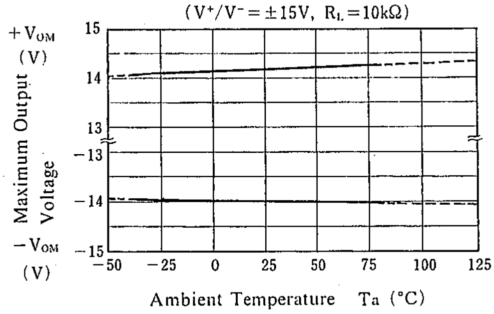
Operating Current vs. Temperature

(V+/V− = ±15V)



Maximum Output Voltage vs. Temperature

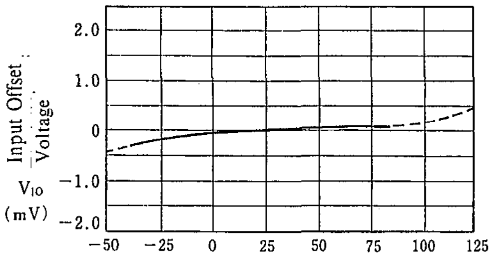
(V+/V− = ±15V, RL = 10kΩ)



■ TYPICAL CHARACTERISTICS

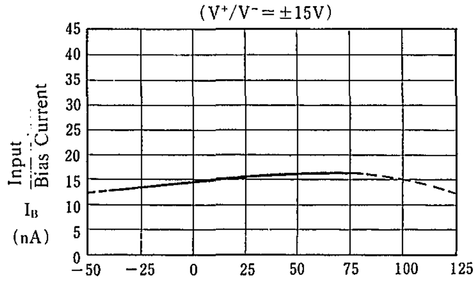
Input Offset Voltage vs. Temperatare

(V+/V−=±15V)



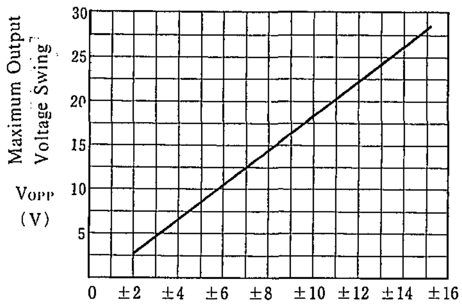
Input Bias Current vs. Temperature

(V+/V−=±15V)



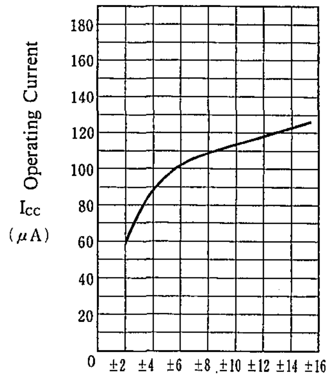
Maximum Output Voltage Swing vs. Operating Voltage

(RL=10kΩ, Ta=25℃)



Operating Current vs. Operating Voltage

(No Input Signal RL=∞, Ta=25°C)



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