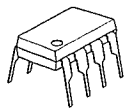
DUAL LOW POWER OPERATIONAL AMPLIFIER

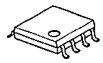
■ GENERAL DESCRIPTION

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

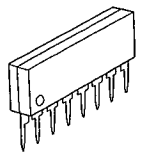


NJM022D



NJM022M

NJM022V

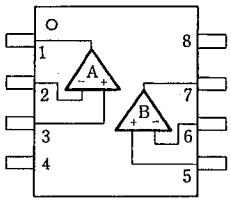


NJM022L

■ FEATURES

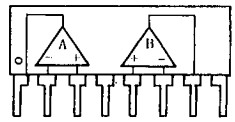
- Operating Voltage (±2V～±18V)
- Low Operating Current (130 μAtyp.)
- Slew Rate (0.5V/ μs typ.)
- Short-Circuit Protection
- Package Outline DIP8, DMP8, SSOP8, SIP8
- Bipolar Technology

■ PIN CONFIGURATION



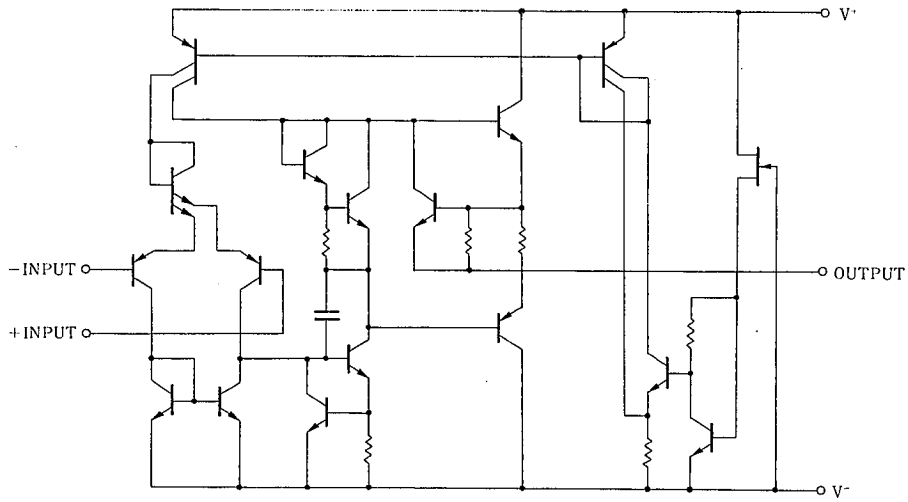
NJM022D
NJM022M
NJM022V

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℃)

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

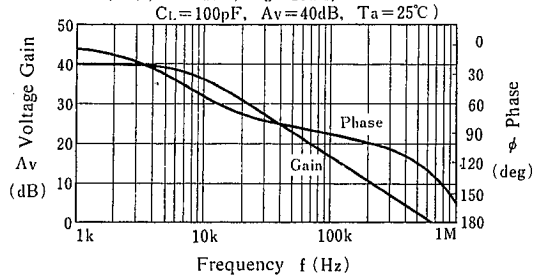
($Ta=+25℃$, $V^+/V^-=±15V$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_S \leqq 10k\Omega$	—	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	$R_L \geqq 10k\Omega$, $V_O=±10V$	60	88	—	dB
Common Mode Rejection Ratio	CMR	$R_S \leqq 10k\Omega$	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	$R_S \leqq 10k\Omega$	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

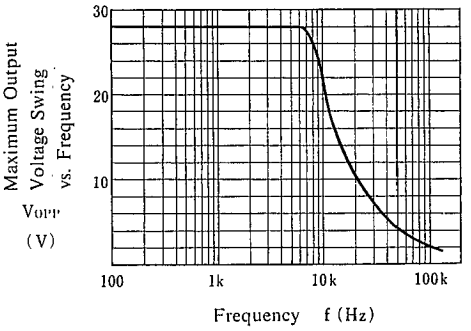
Voltage Gaim, Phase vs. Frequency

($V^+/V^-=\pm15V$, $R_L=10k\Omega$, $C_L=100pF$, $A_V=40dB$, Ta=25°C)



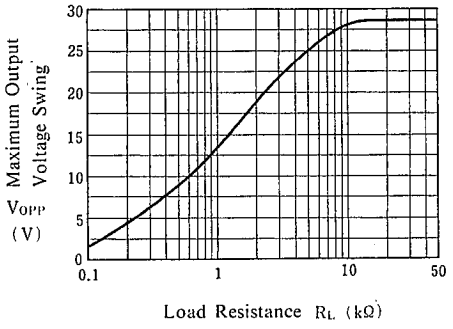
Maximum Output Voltage Swing vs. Frequency

($V^+/V^-=\pm15V$, $R_L=10k\Omega$, Ta=25°C)



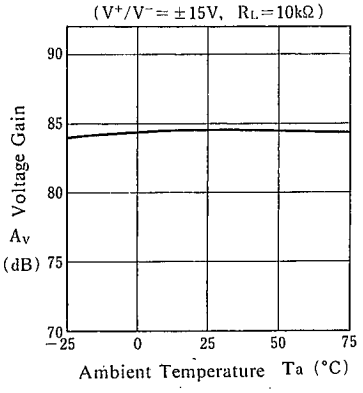
Maximum Output Voltage Swing vs. Load Resistance

($V^+/V^-=\pm15V$, Ta=25°C)



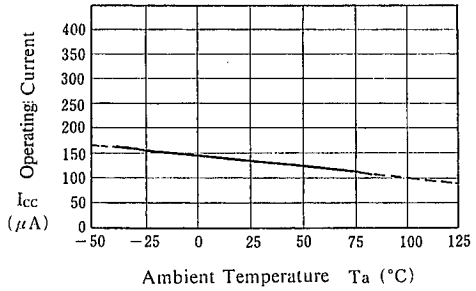
Voltage Gain vs. Temperature

($V^+/V^-=\pm15V$, $R_L=10k\Omega$)



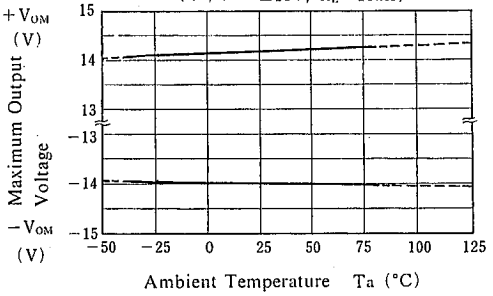
Operating Current vs. Temperature

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



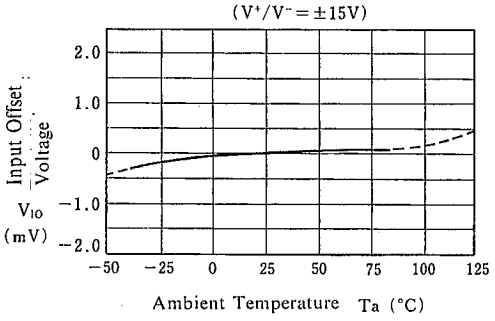
Maximum Output Voltage vs. Temperature

($V^+/V^-=\pm15V$, $R_L=10k\Omega$)

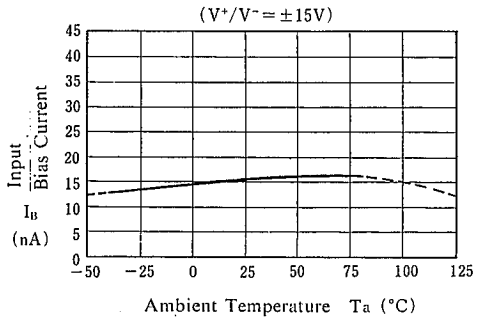


■ TYPICAL CHARACTERISTICS

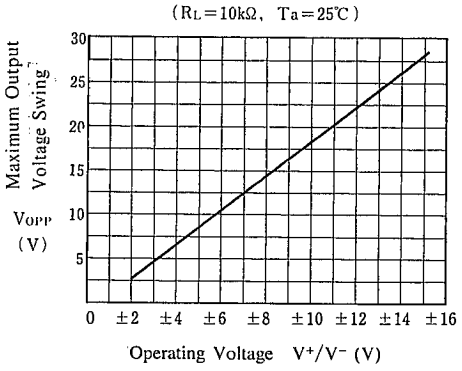
Input Offset Voltage vs. Temperatare



Input Bias Current vs. Temperature

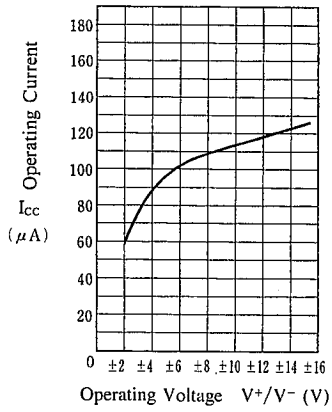


Maximum Output Voltage Swing vs. Operating Voltage



Operating Current vs. Operating Voltage

(No Input Signal R_L =∞, Ta=25°C)



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