

DUAL LOW POWER OPERATIONAL AMPLIFIER

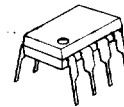
■ GENERAL DESCRIPTION

The NJM022B is a dual low-power operational amplifier. Like the NJM022, the NJM022B is the wide operating voltage range, high input impedance, low operating current, low input noise voltage, internally frequency compensated, latch-up free, high slew rate amplifier with the short circuit protection. The NJM022B is twice the slew rate and half the input noise voltage comparing to the NJM022 with increased operating current.

■ FEATURES

- Operating Voltage $(\pm 2V \sim \pm 18V)$
- Low Operating Current $(250 \mu A \text{ typ})$
- Slew Rate $(1V/\mu s \text{ typ})$
- Short-Circuit Protection
- Package Outline DIP8, DMP8, SIP8, (SSOP8)
- Bipolar Technology

■ PACKAGE OUTLINE



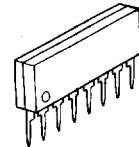
NJM022BD



NJM022BM

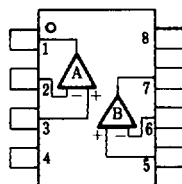


NJM022BV

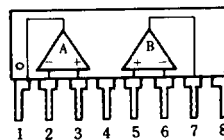


NJM022BL

■ PIN CONFIGURATION



NJM022BD
NJM022BM
NJM022BV

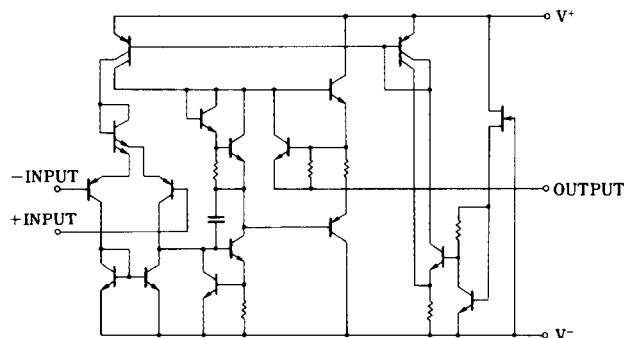


NJM022BL

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°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺ /V ⁻	±18	V
Input Voltage	V _I	±15	V
Differential Input Voltage	V _{ID}	±30	V
Power Dissipation	P _D	(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW
		(SIP8) 800	mW
Operating Temperature Range	T _{opr}	-20 ~ +75	°C
Storage Temperature Range	T _{stg}	-40 ~ +125	°C

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

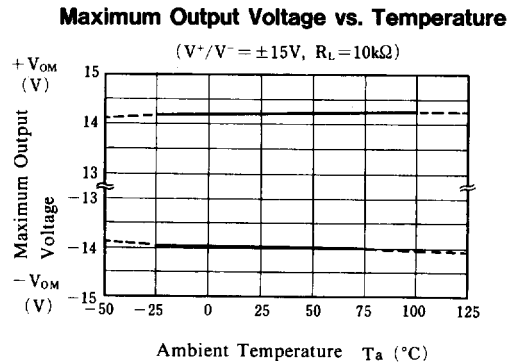
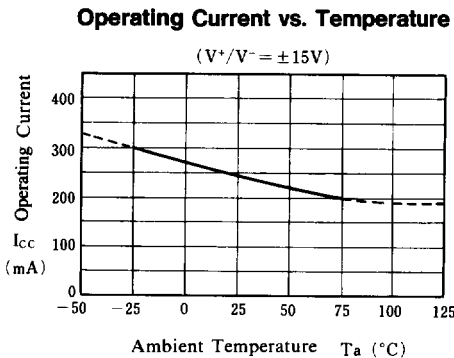
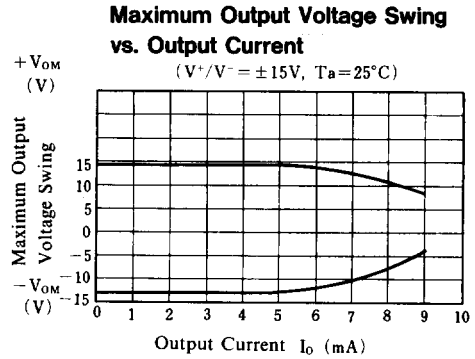
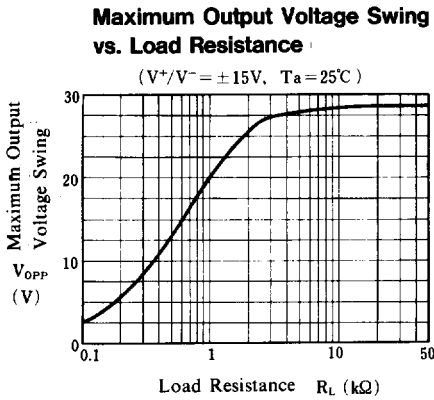
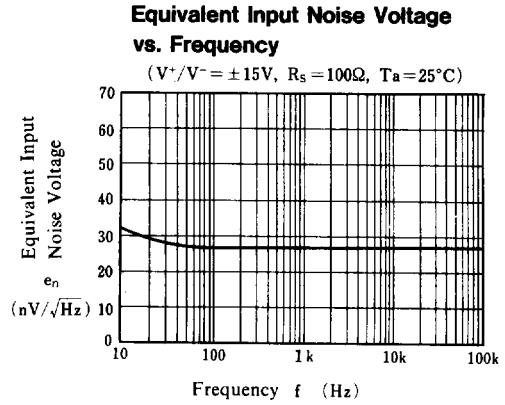
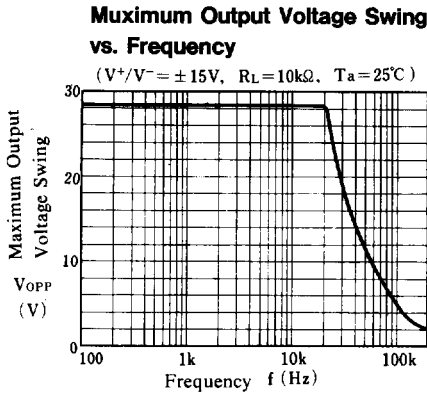
■ ELECTRICAL CHARACTERISTICS

(Ta = +25°C, 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 _B		—	20	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	92	—	dB
Response Time (Rise Time)	t _R	V _{IN} = 20mV, R _L = 10kΩ, C _L = 100pF	—	0.18	—	μs
Slew Rate	SR	V _{IN} = 10V, R _L = 10kΩ, C _L = 100pF	—	1	—	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	—	25	—	nV/√Hz
Short-circuit Output Current	I _{OS}		—	±8	—	mA
Operating Current	I _{CC}		—	250	500	μA
Maximum Peak-to-Peak Output Voltage	V _{OM}	R _L = 10kΩ	±10	±14	—	V



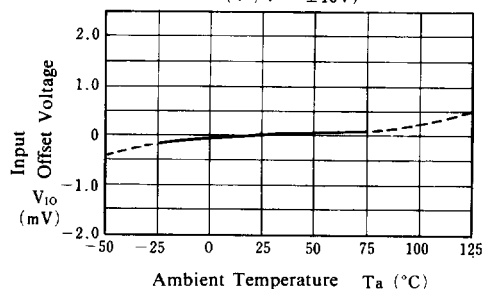
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS

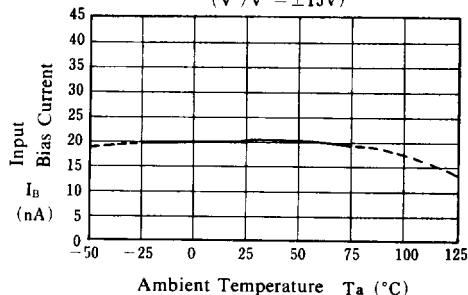
Input Offset Voltage vs. Temperature

($V^+/V^- = \pm 15V$)



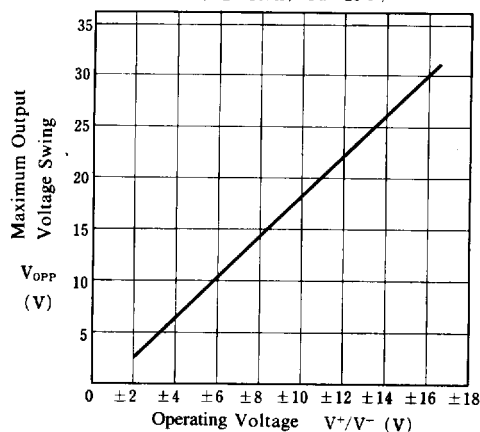
Input Bias Current vs. Temperature

($V^+/V^- = \pm 15V$)



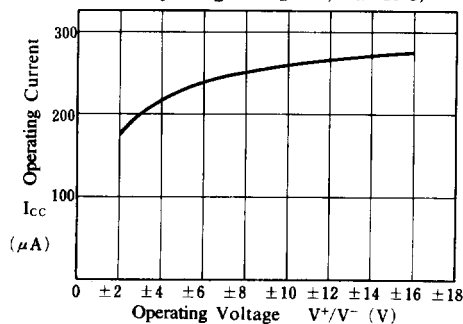
Maximum Output Voltage Swing vs. Operating Voltage

($R_L = 10k\Omega$, $T_a = 25^\circ C$)



Operating Current vs. Operating Voltage

(No Input Signal, $R_L = \infty$, $T_a = 25^\circ C$)



Voltage Gain, Phase vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$, 40dB Am, $T_a = 25^\circ C$)

