

DUAL LOW POWER OPERATIONAL AMPLIFIER

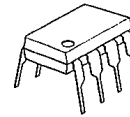
■ GENERAL DESCRIPTION

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 (±2V ~ ±18V)
- Low Operating Current (250 μA typ)
- Slew Rate (1V/μs typ)
- Short-Circuit Protection
- Package Outline DIP8, DMP8, SIP8, (SSOP8)
- Bipolar Technology

■ PACKAGE OUTLINE



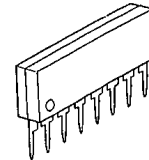
NJM022BD



NJM022BM



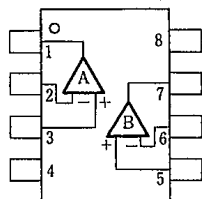
NJM022BV



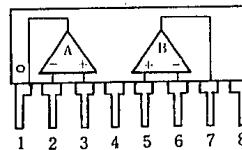
NJM022BL

■ PIN CONFIGURATION

4



NJM022BD  
NJM022BM  
NJM022BV

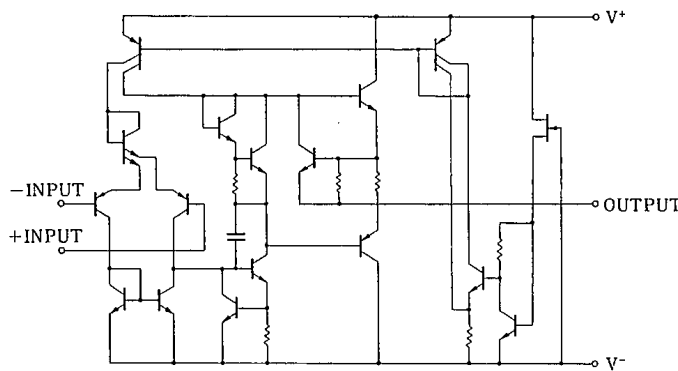


NJM022BL

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 <sup>+</sup> /V <sup>-</sup>	±18	V
Input Voltage	V <sub>IC</sub>	±15	V
Differential Input Voltage	V <sub>ID</sub>	±30	V
Power Dissipation	P <sub>D</sub>	(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW
		(SIP8) 800	mW
Operating Temperature Range	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 ~ +125	°C

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

## ■ ELECTRICAL CHARACTERISTICS

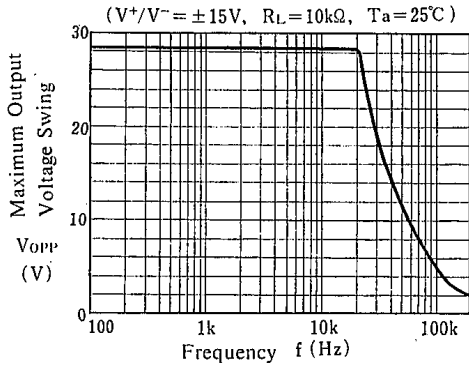
(Ta=+25°C, V<sup>+</sup>/V<sup>-</sup>=±15V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> ≤ 10kΩ	—	1	5	mV
Input Offset Current	I <sub>IO</sub>		—	1	80	nA
Input Bias Current	I <sub>B</sub>		—	20	250	nA
Large Signal Voltage Gain	A <sub>V</sub>	R <sub>L</sub> ≥ 10kΩ, V <sub>O</sub> = ±10V	60	88	—	dB
Common Mode Rejection Ratio	CMR	R <sub>S</sub> ≤ 10kΩ	60	92	—	dB
Response Time (Rise Time)	t <sub>R</sub>	V <sub>IN</sub> = 20mV, R <sub>L</sub> = 10kΩ, C <sub>L</sub> = 100pF	—	0.18	—	μs
Slew Rate	SR	V <sub>IN</sub> = 10V, R <sub>L</sub> = 10kΩ, C <sub>L</sub> = 100pF	—	1	—	V/μs
Input Common Mode Voltage Range	V <sub>ICM</sub>		±12	±13	—	V
Supply Voltage Rejection Ratio	SVR	R <sub>S</sub> ≤ 10kΩ	74	110	—	dB
Equivalent Input Noise Voltage	V <sub>NI</sub>	A <sub>V</sub> = 20dB, f = 1kHz	—	25	—	nV/√Hz
Short-circuit Output Current	I <sub>OS</sub>		—	±8	—	mA
Operating Current	I <sub>CC</sub>		—	250	500	μA
Maximum Peak-to-Peak Output Voltage	V <sub>OM</sub>	R <sub>L</sub> = 10kΩ	±10	±14	—	V

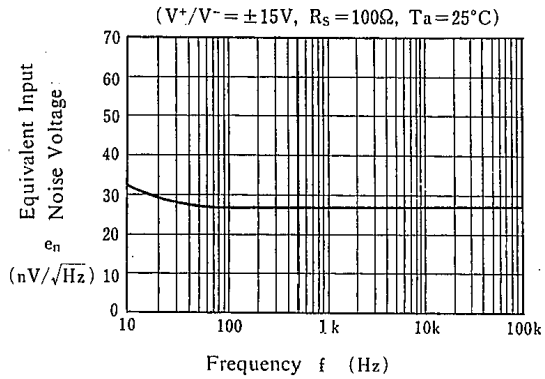
4

## ■ TYPICAL CHARACTERISTICS

**Maximum Output Voltage Swing vs. Frequency**

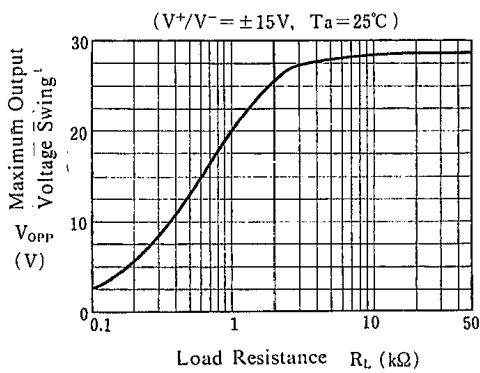


**Equivalent Input Noise Voltage vs. Frequency**

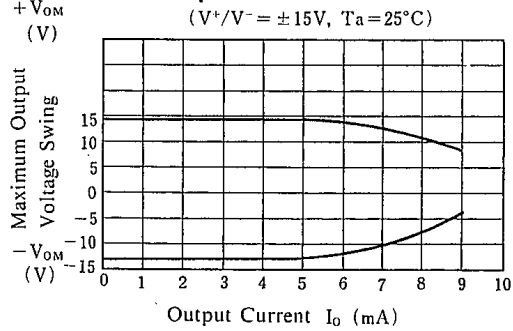


4

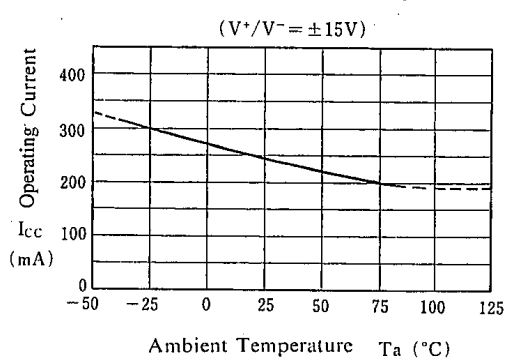
**Maximum Output Voltage Swing vs. Load Resistance**



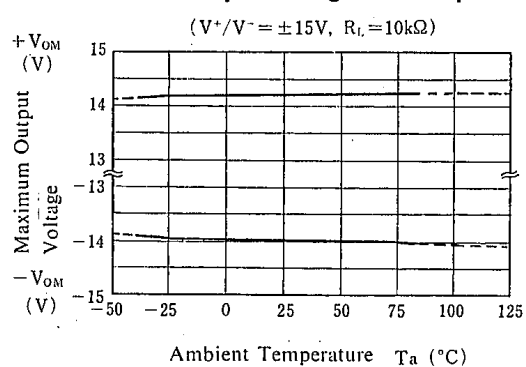
**Maximum Output Voltage Swing vs. Output Current**



**Operating Current vs. Temperature**



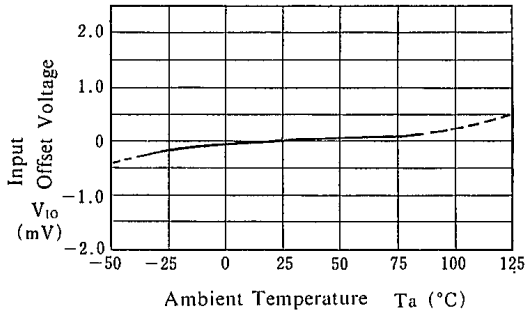
**Maximum Output Voltage vs. Temperature**



■ TYPICAL CHARACTERISTICS

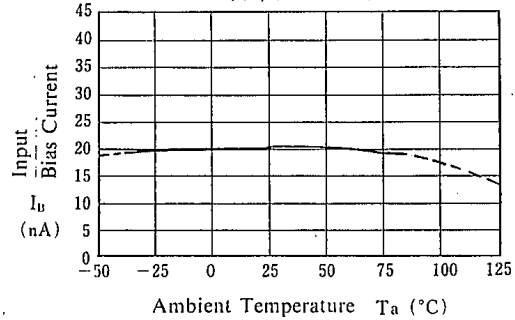
Input Offset Voltage vs. Temperature

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



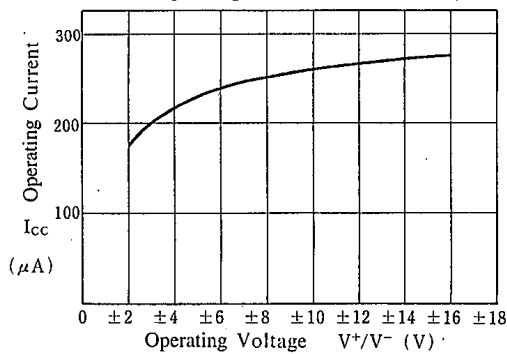
Input Bias Current vs. Temperature

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



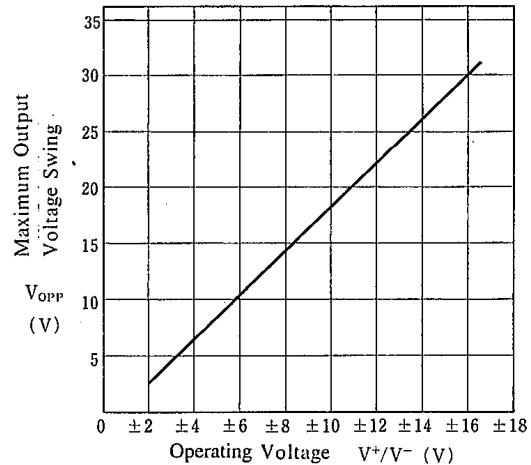
Operating Current vs. Operating Voltage

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



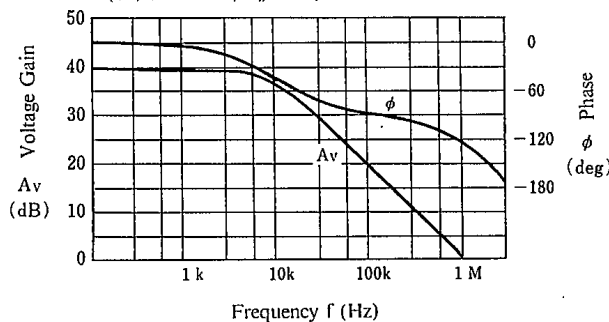
Maximum Output Voltage Swing vs. Operating Voltage

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



Voltage Gain, Phase vs. Frequency

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



4

# NJM022B

---

## MEMO

**[CAUTION]**

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

---

*New Japan Radio Co., Ltd.*