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New Japan Radio Co.,Ltd.

www.njr.com

MICRO-POWER OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4250 is extremely versatile programmable monolithic operational amplifiers. A single external master bias current setting resistor programs the input bias current, input offset current, quiescent power consumption, slew rate, input noise, and the gain-bandwidth product. The device is a truly general purpose operational amplifier.

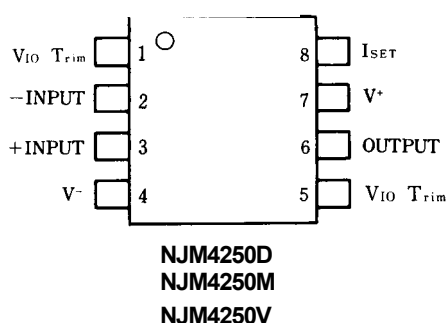
■ PACKAGE OUTLINE



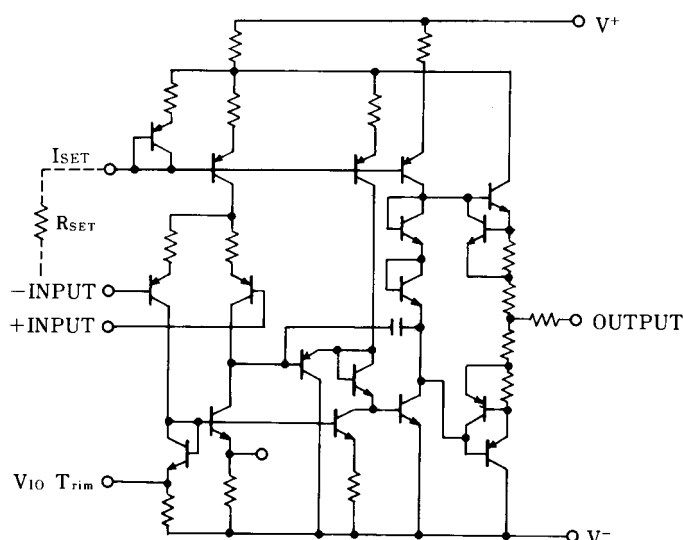
■ FEATURES

- Operating Voltage $(\pm 1V \sim \pm 18V)$
- Low Operating Current $(0.1mA \text{ max.})$
- Programmable monolithic OP-Amp
- Very Low Power Consumption
- Package Outline DIP8, DMP8, SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJM4250

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	± 18	V
Differential Input Voltage	V_{ID}	± 30	V
Input Voltage	V_{IC}	± 15 (note)	V
Power Dissipation	P_D	(DIP8) 500 (DMP8) 300 (SSOP8) 250	mW
I_{SET} Current	I_{SET}	150	μA
Operating Temperature Range	T_{opr}	-20~+75	°C
Storage Temperature Range	T_{stg}	-40~+125	°C

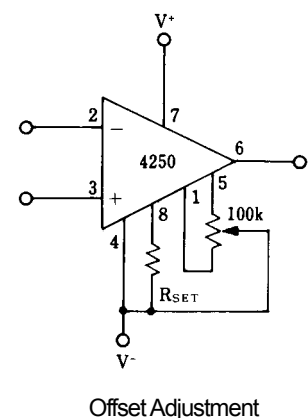
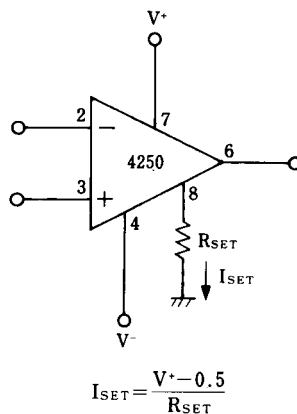
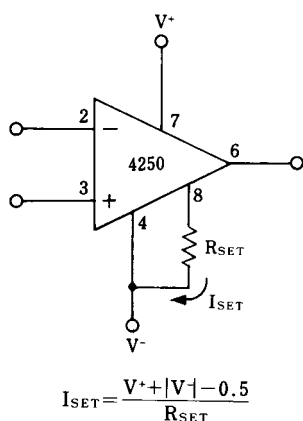
(note) For supply voltage less than $\pm 15V$, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, $V^+/V^- = \pm 15V$)

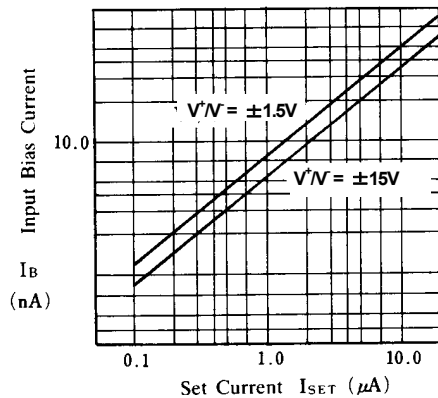
PARAMETER	SYMBOL	TEST CONDITION	$I_{SET}=1\mu A$		$I_{SET}=10\mu A$		UNIT
			MIN.	MAX.	MIN.	MAX.	
Input Offset Voltage 1	V_{IO1}	$R_S \leq 100k\Omega$	-	5	-	6	mV
Input Offset Voltage 2	V_{IO2}	$V^+/V^- = \pm 1.5V, R_S \leq 100k\Omega$	-	5	-	6	mV
Input Offset Current	I_{IO}		-	6	-	20	nA
Input Bias Current 1	I_{B1}		-	10	-	75	nA
Input Bias Current 2	I_{B2}	$V^+/V^- = \pm 1.5V$	-	10	-	75	nA
Large Signal Voltage Gain 1	A_{V1}	$V_O = \pm 10V, R_L \geq 100k\Omega$	96	-	-	-	dB
Large Signal Voltage Gain 2	A_{V2}	$V_O = \pm 10V, R_L \geq 10k\Omega$	-	-	96	-	dB
Operating Current 1	I_{CC1}		-	11	-	100	μA
Operating Current 2	I_{CC2}	$V^+/V^- = \pm 1.5V$	-	8	-	90	μA
Input Common Mode Voltage Range 1	V_{ICM1}		± 13.5	-	± 13.5	-	V
Input Common Mode Voltage Range 2	V_{ICM2}	$V^+/V^- = \pm 1.5V$	± 0.6	-	± 0.6	-	V
Maximum Output Voltage Swing 1	V_{OM1}	$R_L \geq 100k\Omega$	± 12	-	-	-	V
Maximum Output Voltage Swing 2	V_{OM2}	$V^+/V^- = \pm 1.5V, R_L \geq 100k\Omega$	± 0.6	-	-	-	V
Maximum Output Voltage Swing 3	V_{OM3}	$R_L \geq 10k\Omega$	-	-	± 12	-	V
Maximum Output Voltage Swing 4	V_{OM4}	$V^+/V^- = \pm 1.5V, R_L \geq 10k\Omega$	-	-	± 0.6	-	V
Common Mode Rejection Ratio	CMR	$R_S \leq 10k\Omega$	70	-	70	-	dB
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10k\Omega$	74	-	74	-	dB

■ TYPICAL APPLICATION (I_{SET}, V_{IO} Adjustment)

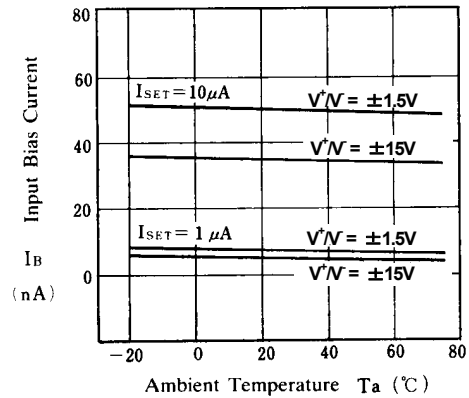


■ TYPICAL CHARACTERISTICS

Input Bias Current vs. Set Current
($T_a = 25^\circ\text{C}$)

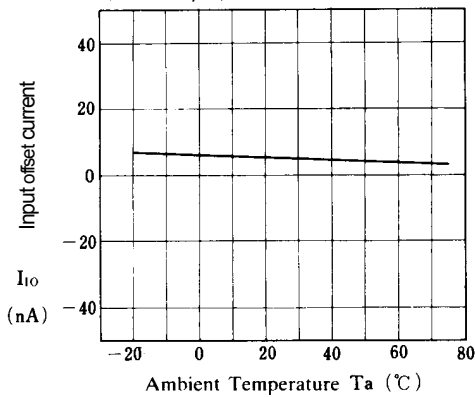


Input Bias Current vs. Temperature



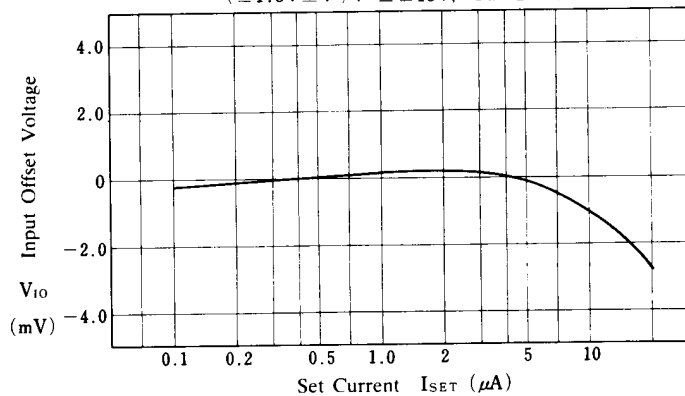
Input Offset Current vs. Ambient Temperature

($I_{SET} = 10\mu\text{A}$, $\pm 1.5\text{V} \leq V^+/V^- \leq \pm 15\text{V}$)



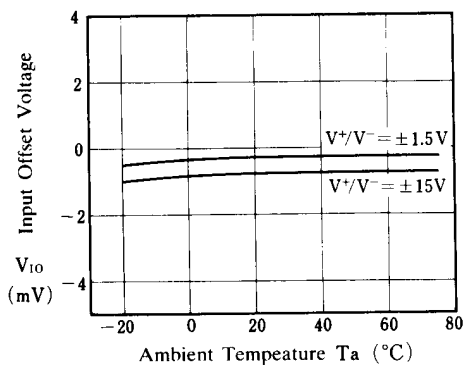
Input Offset Voltage vs. Set Current

($\pm 1.5\text{V} \leq V^+/V^- \leq \pm 15\text{V}$, $T_a = 25^\circ\text{C}$)



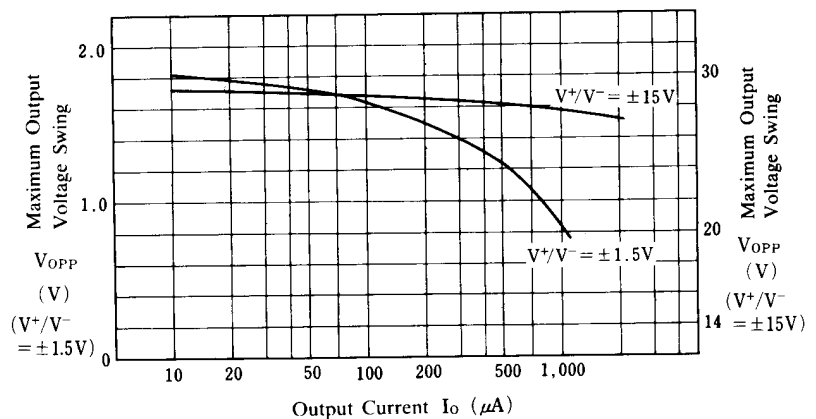
Input Offset Voltage vs. Ambient Temperature

($I_{SET} = 10\mu\text{A}$)

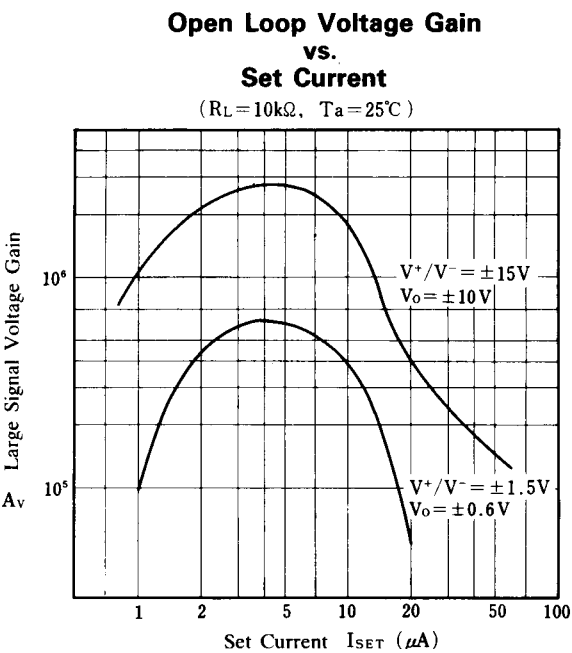
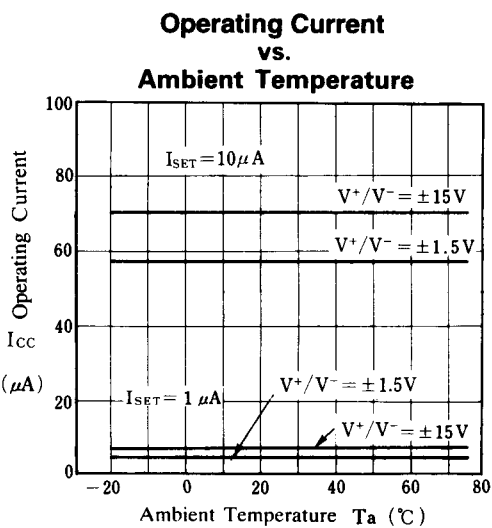
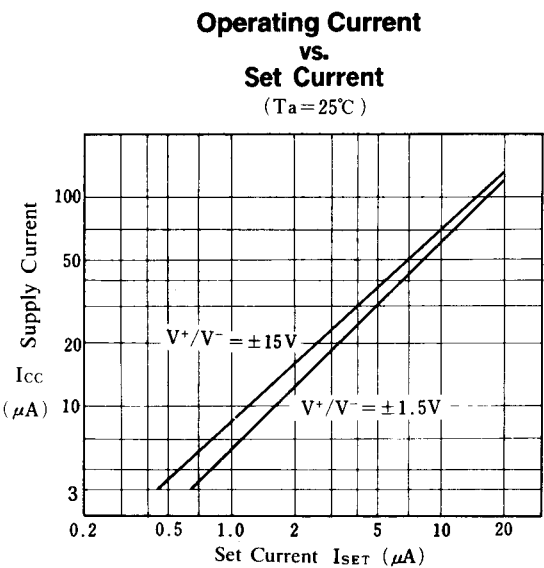
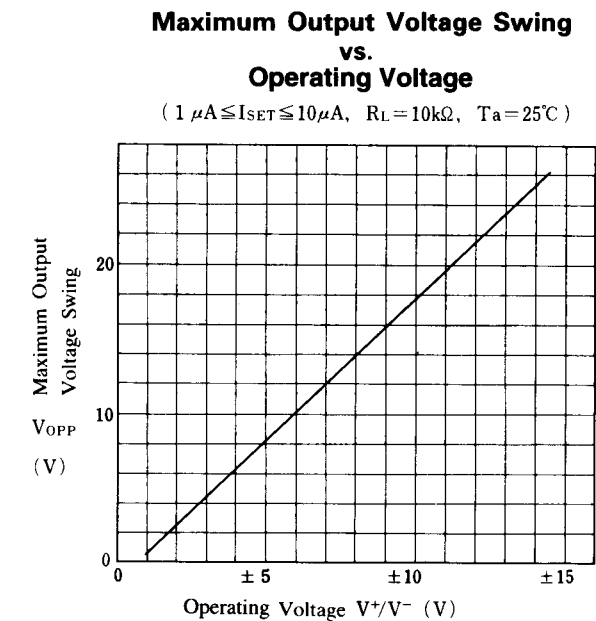


Maximum Output Voltage Swing vs. Output Current

($I_{SET} = 10\mu\text{A}$, $T_a = 25^\circ\text{C}$)

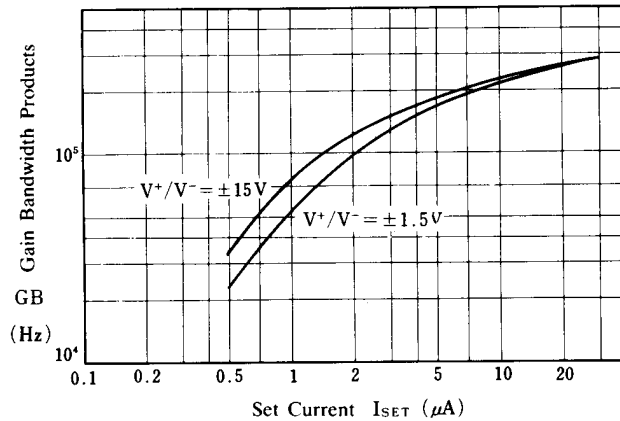


■ TYPICAL CHARACTERISTICS

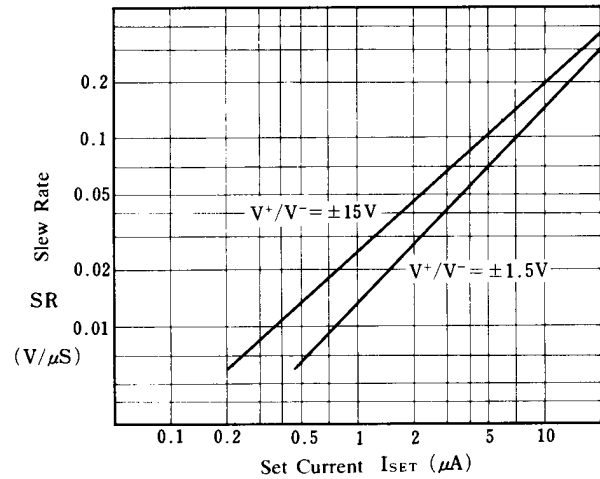


■ TYPICAL CHARACTERISTICS

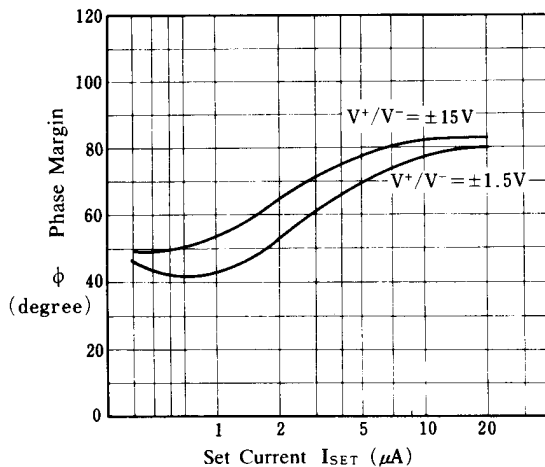
**Gain Bandwidth Product
Vs.
Set Current**
($T_a = 25^\circ\text{C}$)



**Slew Rate
vs.
Set Current**
($R_L = 10\text{k}\Omega$, $T_a = 25^\circ\text{C}$)

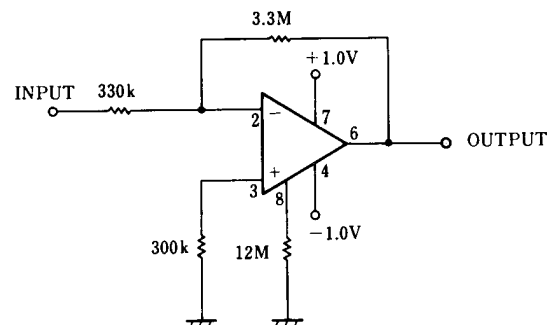


**Phase Margin
vs.
Set Current**



■ TYPICAL APPLICATIONS

Micro-power 10times Inverting Amplifier



[CAUTION]

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