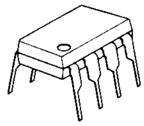
MICRO-POWER OPERATIONAL AMPLIFIER

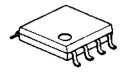
■ GENERAL DESCRIPTION

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.

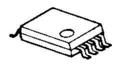
■ PACKAGE OUTLINE



NJM4250D



NJM4250M

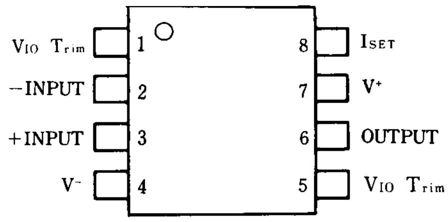


NJM4250V

■ FEATURES

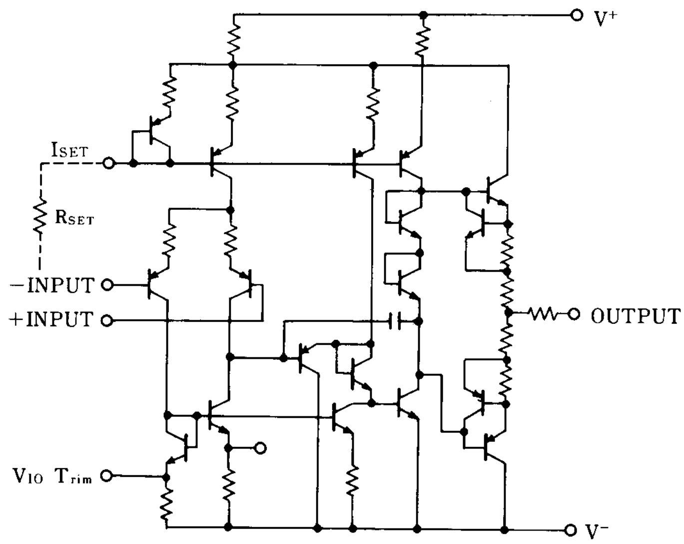
- Operating Voltage (±1V~±18V)
- Low Operating Current (0.1mA max.)
- Programmable monolithic OP-Amp
- Very Low Power Consumption
- Package Outline DIP8,DMP8,SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



NJM4250D
NJM4250M
NJM4250V

■ EQUIVALENT CIRCUIT



■ 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

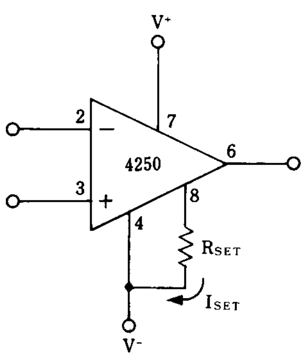
(note) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

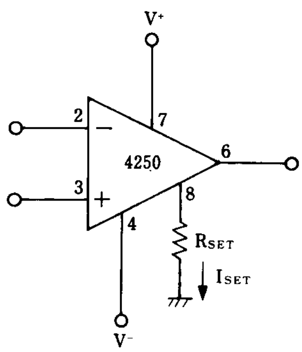
(Ta=25˚C, V^+/V^-=±15V)

PARAMETER	SYMBOL	TEST CONDITION	I_{SET}=1µA		I_{SET}=10µA		UNIT
			MIN.	MAX.	MIN.	MAX.	
Input Offset Voltage 1	V_{IO1}	R_S≤100kΩ	-	5	-	6	mV
Input Offset Voltage 2	V_{IO2}	V^+/V^-=±1.5V, R_S≤100kΩ	-	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^-=±1.5V	-	10	-	75	nA
Large Signal Voltage Gain 1	A_{V1}	V_O=± 10V, R_L≥100kΩ	96	-	-	-	dB
Large Signal Voltage Gain 2	A_{V2}	V_O=± 10V, R_L≥10kΩ	-	-	96	-	dB
Operating Current 1	I_{CC1}		-	11	-	100	µA
Operating Current 2	I_{CC2}	V^+/V^-=±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^-=±1.5V	± 0.6	-	± 0.6	-	V
Maximum Output Voltage Swing 1	V_{OM1}	R_L≥100kΩ	± 12	-	-	-	V
Maximum Output Voltage Swing 2	V_{OM2}	V^+/V^-=±1.5V, R_L≥100kΩ	± 0.6	-	-	-	V
Maximum Output Voltage Swing 3	V_{OM3}	R_L≥10kΩ	-	-	± 12	-	V
Maximum Output Voltage Swing 4	V_{OM4}	V^+/V^-=±1.5V, R_L≥10kΩ	-	-	± 0.6	-	V
Common Mode Rejection Ratio	CMR	R_S≤10kΩ	70	-	70	-	dB
Supply Voltage Rejection Ratio	SVR	R_S≤10kΩ	74	-	74	-	dB

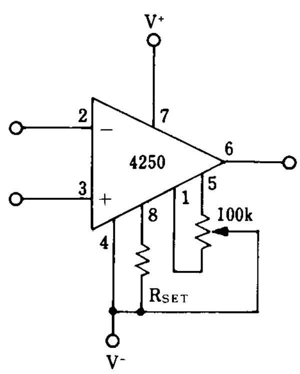
■ TYPICAL APPLICATION (I_{SET}, V_{IO} Adjustment)



$$I_{SET}=\frac{V^+ + |V^-| - 0.5}{R_{SET}}$$



$$I_{SET}=\frac{V^+ - 0.5}{R_{SET}}$$

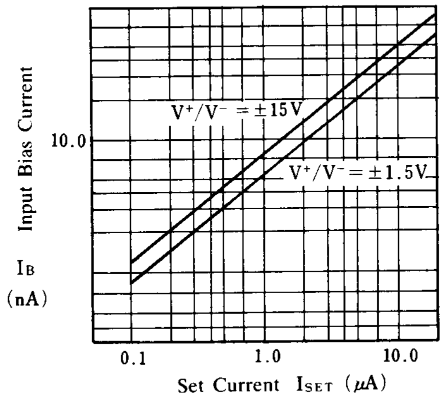


Offset Adjustment

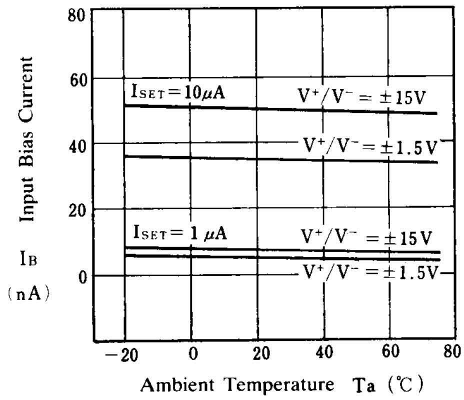
■ TYPICAL CHARACTERISTICS

Input Bias Current vs. Set Current

(Ta=25℃)

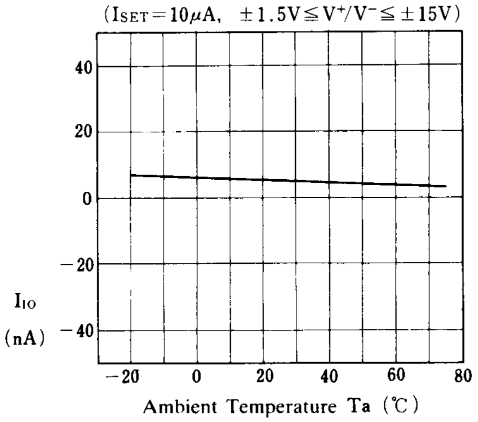


Input Bias Current vs. Temperature



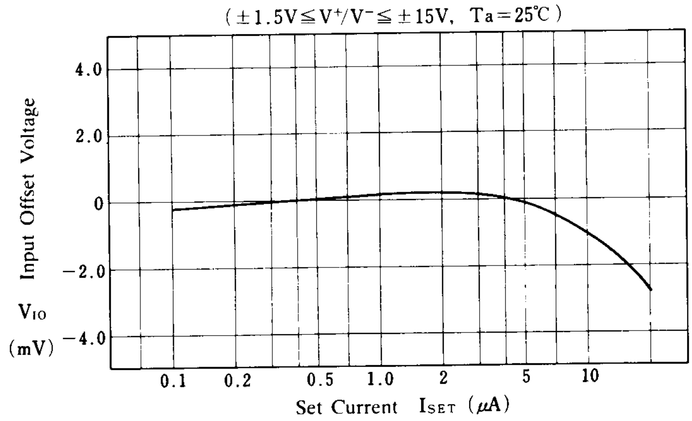
Input Offset Current vs. Ambient Temperature

(ISET=10μA, ±1.5V≦V+/V-≦±15V)



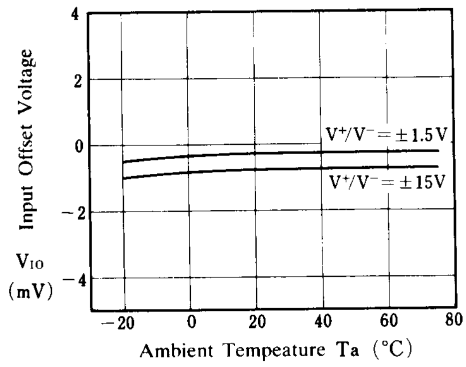
Input Offset Voltage vs. Set Current

(±1.5V≦V+/V-≦±15V, Ta=25℃)



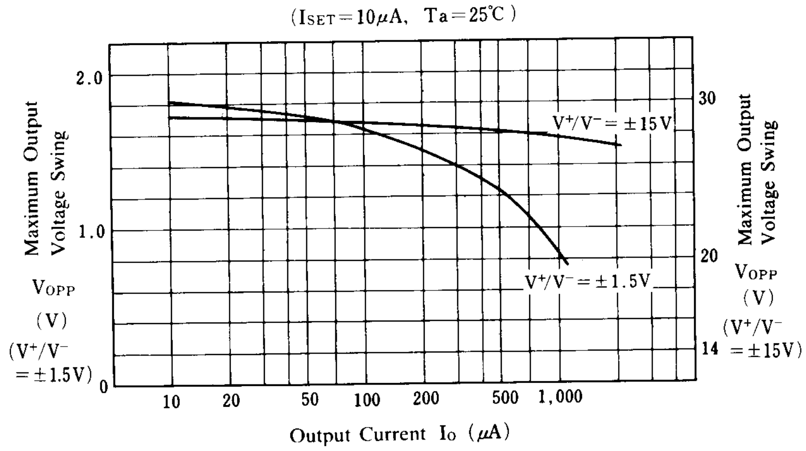
Input Offset Voltage vs. Ambient Temperature

(ISET=10μA)



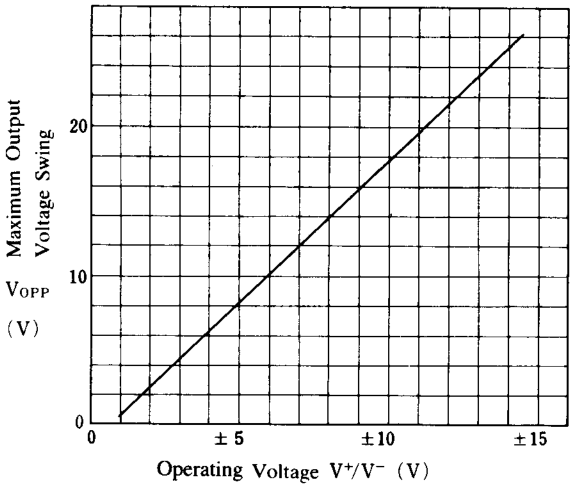
Maximum Output Voltage Swing vs. Output Current

(ISET=10μA, Ta=25℃)

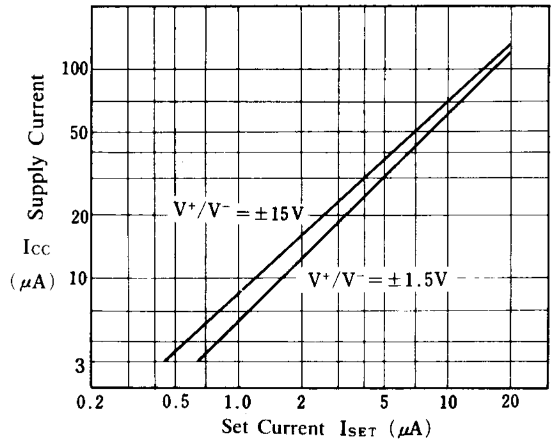


■ TYPICAL CHARACTERISTICS

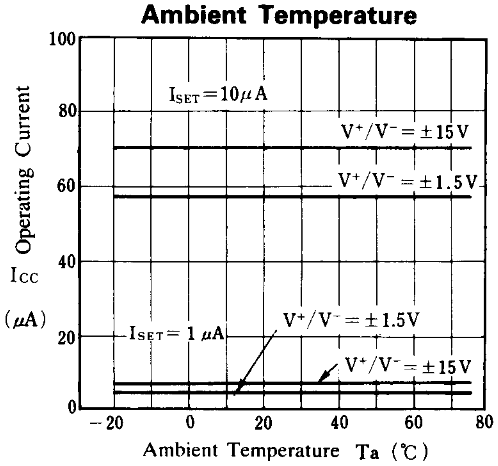
Maximum Output Voltage Swing
vs.
Operating Voltage
(1 μA≦ISET≦10μA, RL=10kΩ, Ta=25℃)



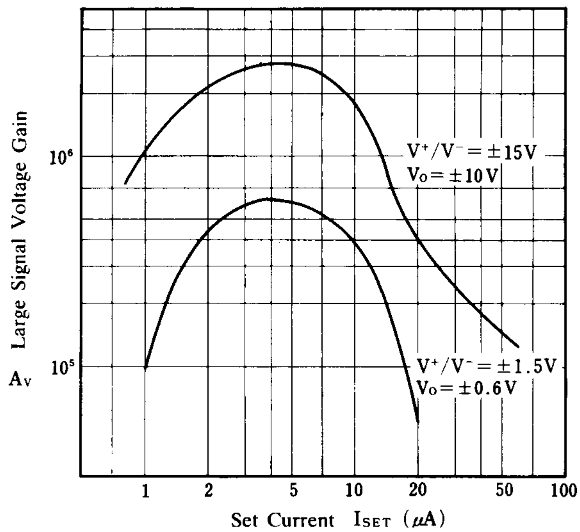
Operating Current
vs.
Set Current
(Ta=25℃)



Operating Current
vs.
Ambient Temperature

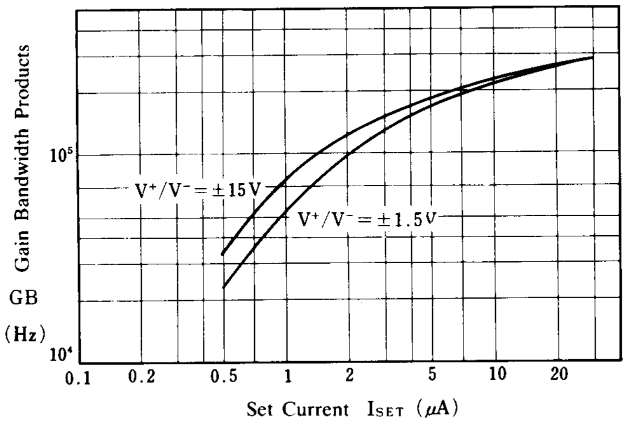


Open Loop Voltage Gain
vs.
Set Current
(RL=10kΩ, Ta=25℃)

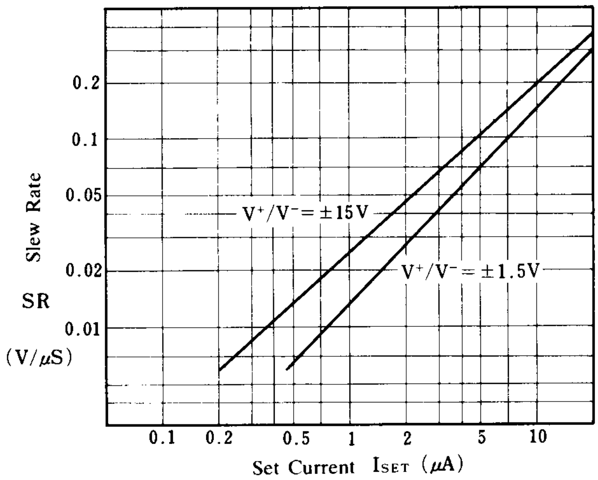


■ TYPICAL CHARACTERISTICS

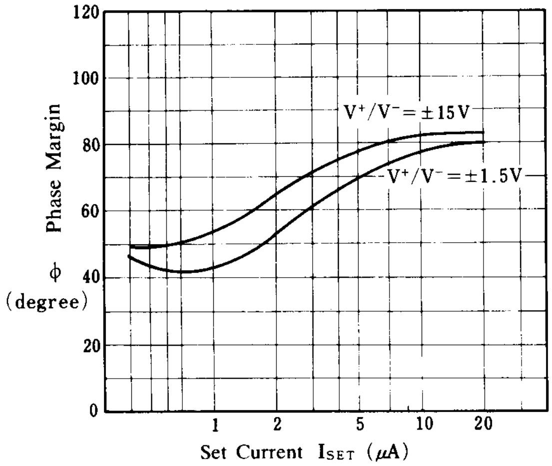
Gain Bnadwidth Product vs. Set Current
(Ta=25℃)



Slew Rate vs. Set Current
(RL=10kΩ, Ta=25℃)

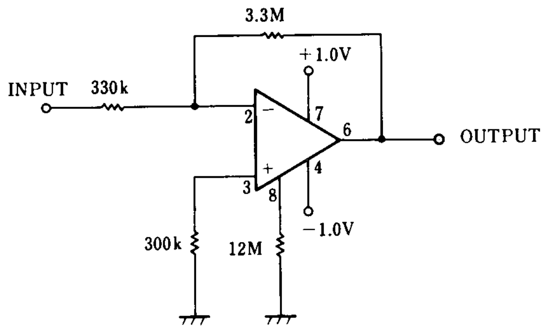


Phase Margin vs. Set Current



■ TYPICAL APPLICATIONS

500nW 10times Inverting Amplifier



[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.