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New Japan Radio Co.,Ltd.

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## LOW-NOISE DUAL PRE-AMPLIFIER

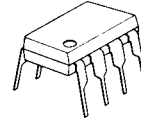
### ■ GENERAL DESCRIPTION

The NJM2043 is a bipolar operational amplifier which is designed as low noise version of the NJM4558 with high output current and fast slew rate ( 6V/μs ) and wide unity gain bandwidth ( 14MHz ) constructed using New JRC Planar epitaxial process.

### ■ FEATURES

- Operating Voltage ( ±4V~±22V )
- High Output Current ( 25mA. )
- Slew Rate ( 6V/μs typ. )
- Unity Gain Bandwidth ( 14MHz typ. )
- Package Outline DIP8,DMP8,SIP8
- Bipolar Technology

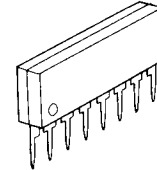
### ■ PACKAGE OUTLINE



NJM2043D

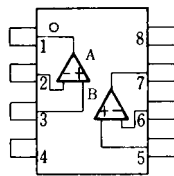


NJM2043M

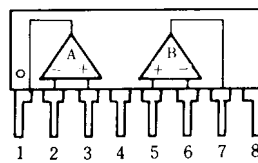


NJM2043L

### ■ PIN CONFIGURATION



NJM2043D  
NJM2043M

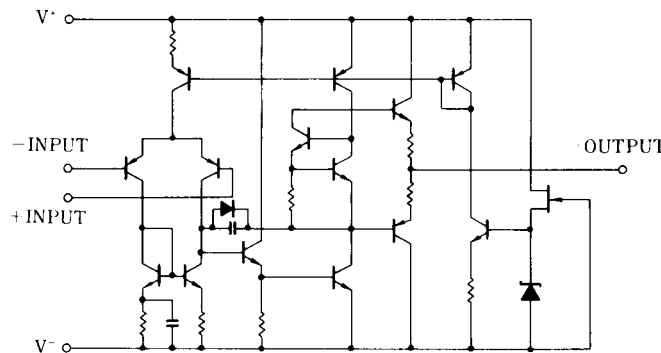


NJM2043L

### 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 )



# NJM2043

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ / V^-$	± 22	V
Differential Input Voltage	$V_{ID}$	± 30	V
Input Voltage	$V_{IC}$	± 15 ( note )	V
Power Dissipation	$P_D$	( DIP8 ) 500 ( DMP8 ) 300 ( 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,  $V^+ / V^- = \pm 15V$  )

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$V_{IO}$	$R_S \leq 10k\Omega$	-	0.3	3	mV
Input Offset Current	$I_{IO}$		-	10	200	nA
Input Bias Current	$I_B$		-	400	1000	nA
Input Resistance	$R_{IN}$		30	100	-	kΩ
Large signal Voltage Gain	$A_V$	$R_L \geq 2k\Omega, V_O = \pm 10V$	86	100	-	dB
Maximum Output Voltage Swing 1	$V_{OM1}$	$R_L \geq 10k\Omega$	± 12	± 14	-	V
Maximum Output Voltage Swing 2	$V_{OM2}$	$I_O = 25mA$	± 10	± 11.5	-	V
Input Common Mode Voltage Range	$V_{ICM}$		± 12	± 14	-	V
Common Mode Rejection Ratio	CMR	$R_S \leq 10k\Omega$	70	100	-	dB
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10k\Omega$	76	100	-	dB
Operating Current	$I_{CC}$		-	6	8	mA
Slew Rate	SR		-	6	-	V/μs
Gain Bandwidth Product	GB		-	14	-	MHz
Equivalent Input Noise Voltage	$V_{NI}$	FLAT+JISA $R_S = 300\Omega$	-	0.4	0.51	μVrms

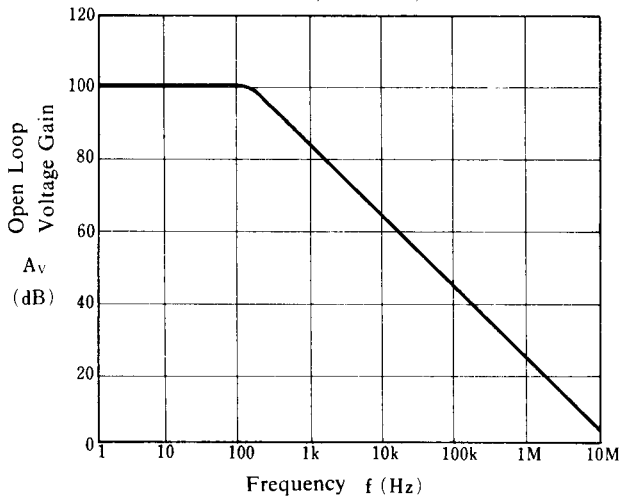
( note1 ) Closed loop gain should be more than 20dB at use.

( note2 ) New JRC's general selected products D rank are also prepared for the noise standard (  $R_S = 2.2k\Omega, R_{IAA}, V_{NI} = 1.4\mu V$  Max. )

## ■ TYPICAL CHARACTERISTICS

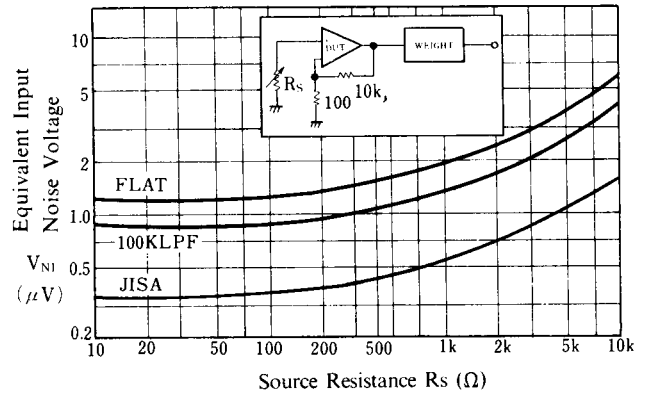
**Open Loop Voltage Gain vs. Frequency**

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



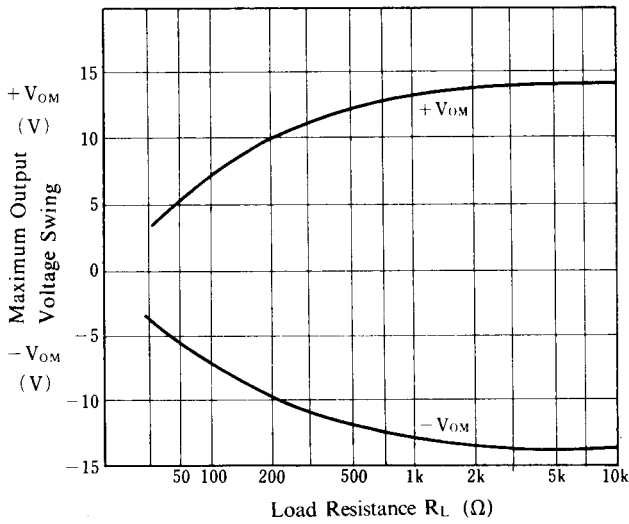
**Equivalent Input Noise Voltage**

( $V^+/V^- = \pm 15V$ ,  $T_a = 25^\circ C$ )



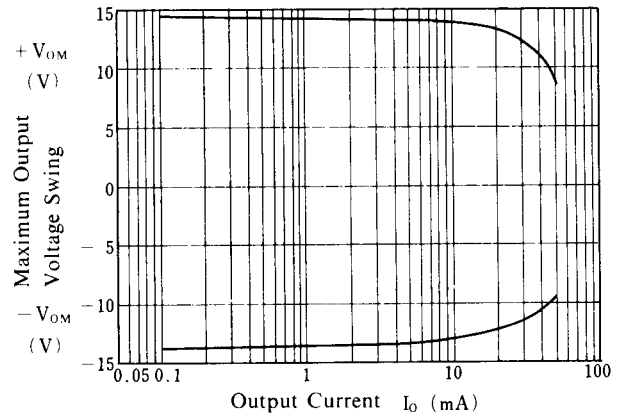
**Maximum Output Voltage Swing vs. Load Resistance**

( $V^+/V^- = \pm 15V$ ,  $T_a = 25^\circ C$ )

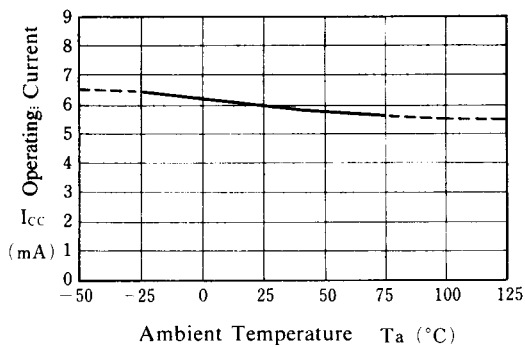


**Maximum Output Voltage Swing vs. Output Current**

( $V^+/V^- = 15V$ ,  $T_a = 25^\circ C$ )

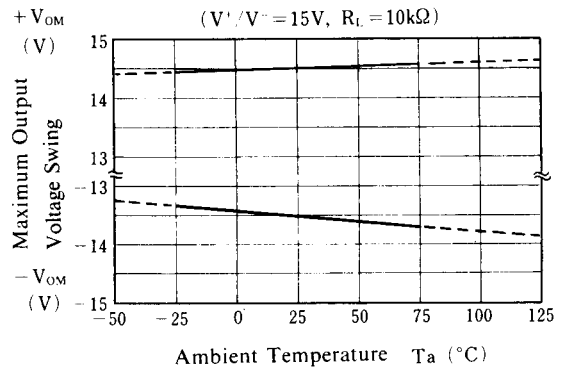


**Operating Current vs. Temperature**



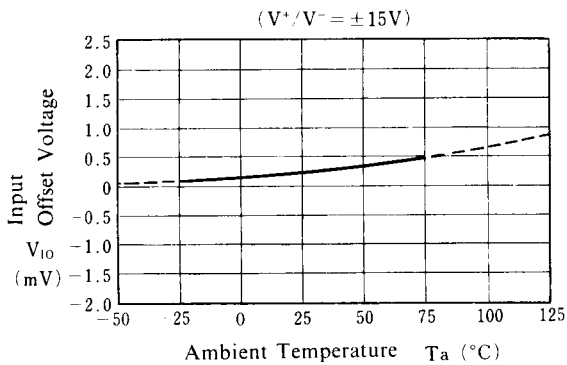
**Maximum Output Voltage Swing vs. Temperature**

( $V^+/V^- = 15V$ ,  $R_L = 10k\Omega$ )

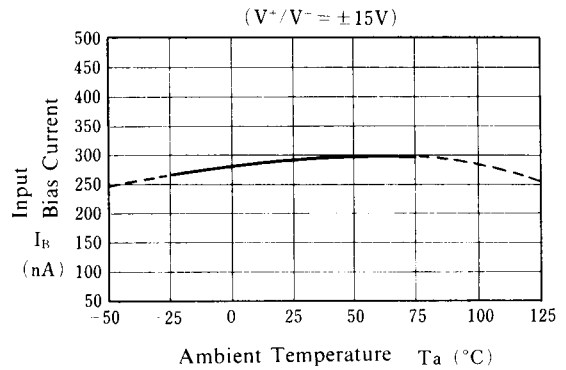


## ■ TYPICAL CHARACTERISTICS

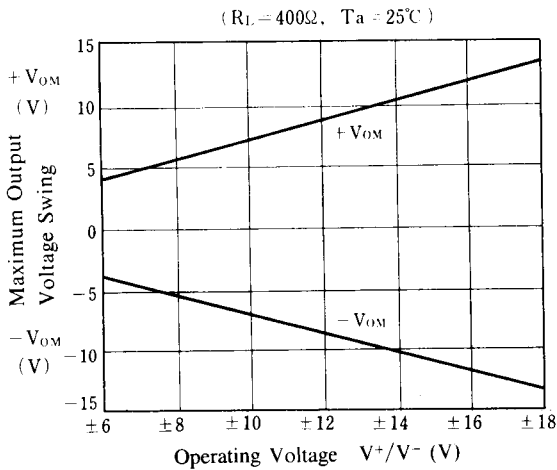
**Input Offset Voltage vs. Temperature**



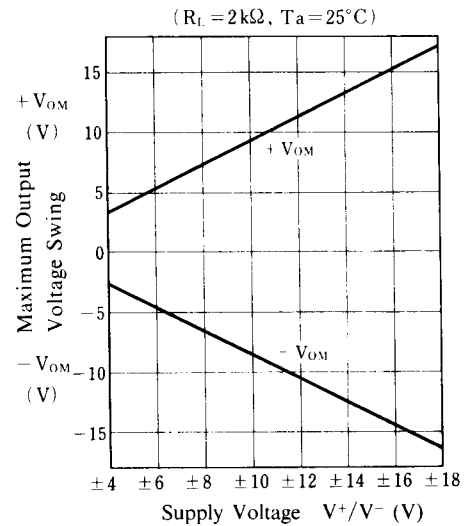
**Input Bias Current vs. Temperature**



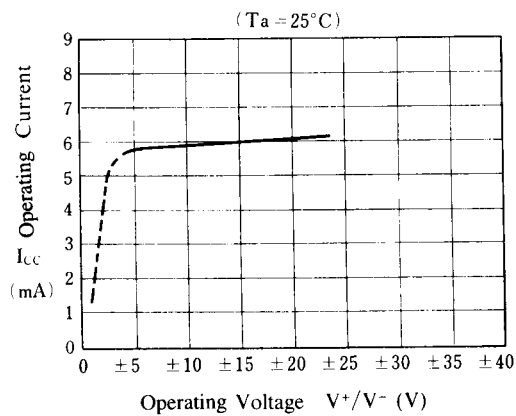
**Maximum Output Voltage Swing vs. Operating Voltage**



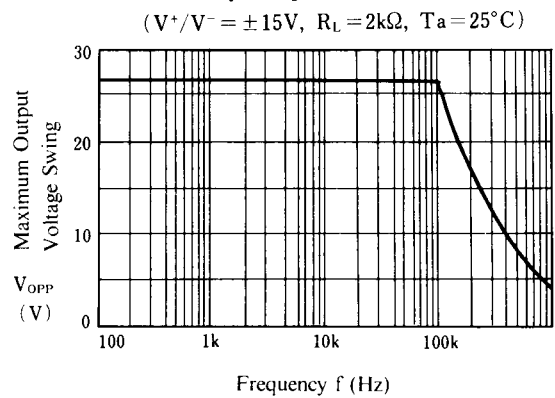
**Maximum Output Voltage Swing vs. Supply Voltage**



**Operating Current vs. Operating Voltage**



**Maximum Output Voltage Swing vs. Frequency**



**[CAUTION]**

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