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New Japan Radio Co.,Ltd.

<http://www.njr.com/>

## LOW-NOISE DUAL OPERATIONAL AMPLIFIER

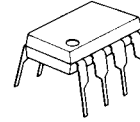
### ■ GENERAL DESCRIPTION

The NJM2041 is a bipolar operational amplifier which is designed as low noise version of the NJM4558 with high output current and fast slew rate (  $3V/\mu s$  ) and wide unity gain bandwidth ( 7MHz ) constructed using New JRC Planar epitaxial process.

### ■ FEATURES

- Operating Voltage (  $\pm 4V \sim \pm 22V$  )
- High Output Current ( 25mA. )
- Slew Rate (  $3V/\mu s$  typ. )
- Unity Gain Bandwidth ( 7MHz typ. )
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

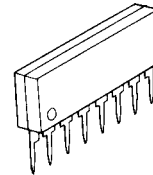
### ■ PACKAGE OUTLINE



NJM2041D

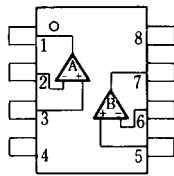


NJM2041M

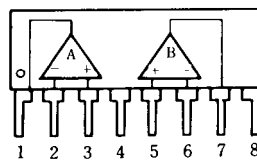


NJM2041L

### ■ PIN CONFIGURATION



NJM2041D  
NJM2041M

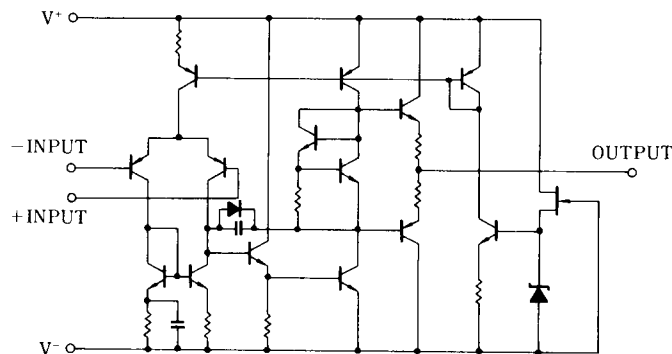


NJM2041L

### PIN FUNCTION

- 1.A OUTPUT
- 2.A -INPUT
- 3.A +INPUT
- 4.V<sup>-</sup>
- 5.B +INPUT
- 6.B -INPUT
- 7.B OUTPUT
- 8.V<sup>+</sup>

### ■ EQUIVALENT CIRCUIT ( 1/2 Shown )



# NJM2041

## ■ 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

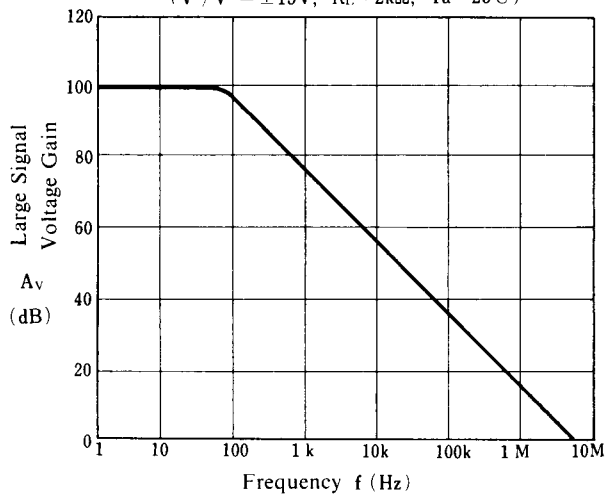
( Ta=25°C,  $V^+ / V^- = \pm 15V$  )

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	$I_B$		-	200	500	nA
Input Resistance	$R_{IN}$		50	200	-	kΩ
Large signal Voltage Gain	$A_V$	$R_L \geq 2k\Omega, V_O = \pm 10V$	86	110	-	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		-	3	-	V/μs
Gain Bandwidth Product	GB		-	7	-	MHz
Equivalent Input Noise Voltage	$V_{NI}$	FLAT+JISA $R_S = 300\Omega$	-	0.48	0.61	μVrms

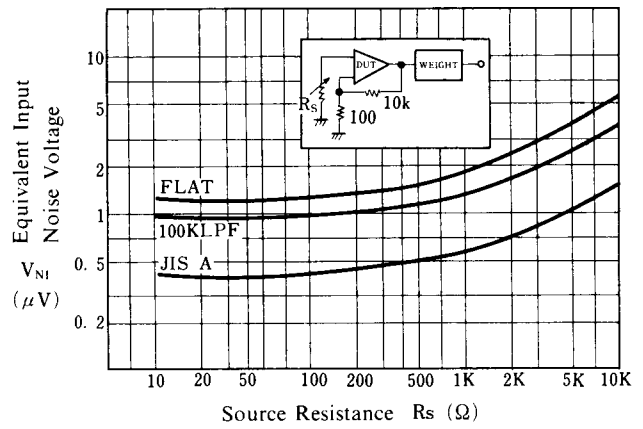
( note ) New JRC's general selected products D rank are also prepared for the noise standard (  $R_S = 2.2k\Omega, R_{IAA}, V_{NI} = 1.4\mu V$  Max. )

## ■ TYPICAL CHARACTERISTICS

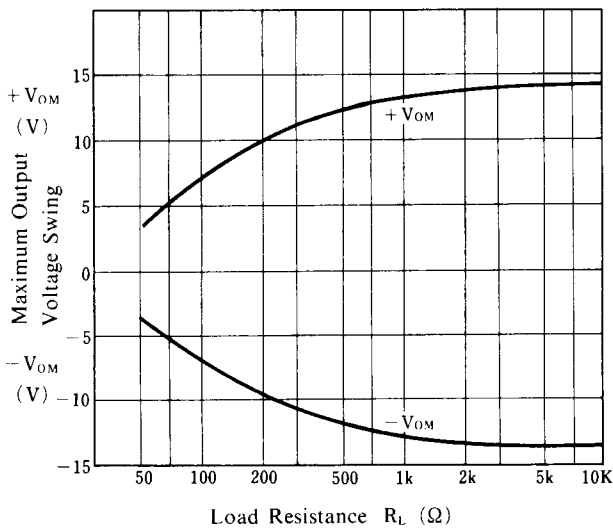
**Large Signal Voltage Gain vs. Frequency**  
 (V<sup>+</sup>/V<sup>-</sup> = ±15V, R<sub>L</sub> = 2kΩ, T<sub>a</sub> = 25°C)



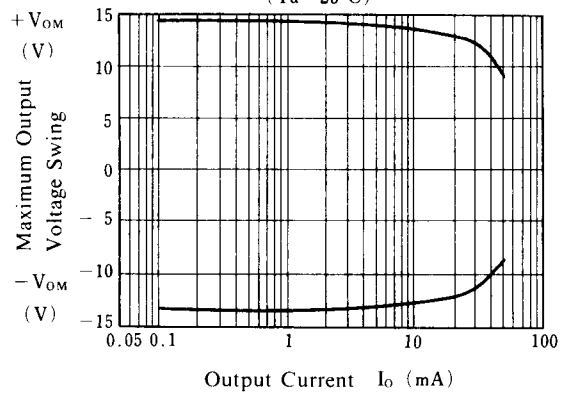
**Equivalent Input Noise Voltage**  
 (V<sup>+</sup>/V<sup>-</sup> = ±15V, T<sub>a</sub> = 25°C)



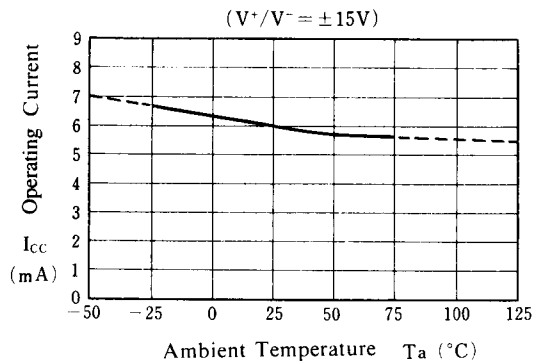
**Maximum Output Voltage Swing vs. Load Resistance**  
 (V<sup>+</sup>/V<sup>-</sup> = ±15V, T<sub>a</sub> = 25°C)



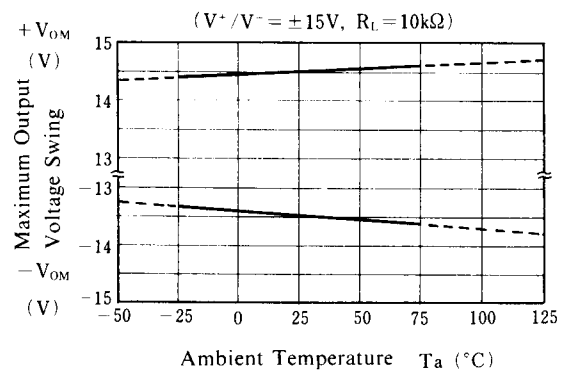
**Maximum Output Voltage Swing vs. Output Current**  
 (T<sub>a</sub> = 25°C)



**Operating Current vs. Temperature**  
 (V<sup>+</sup>/V<sup>-</sup> = ±15V)



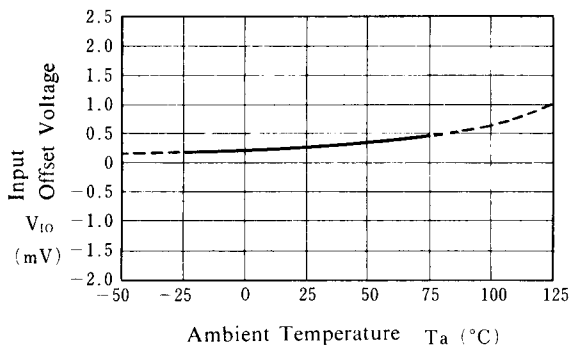
**Maximum Output Voltage Swing vs. Temperature**  
 (V<sup>+</sup>/V<sup>-</sup> = ±15V, R<sub>L</sub> = 10kΩ)



## ■ TYPICAL CHARACTERISTICS

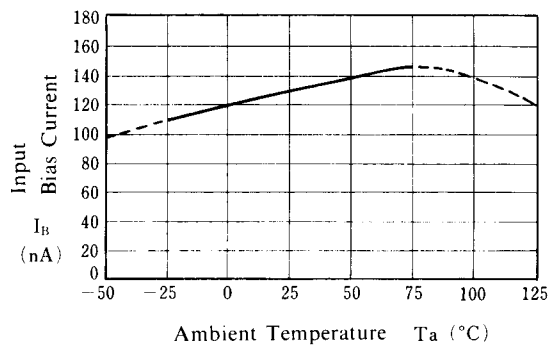
**Input Offset Voltage vs. Temperature**

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



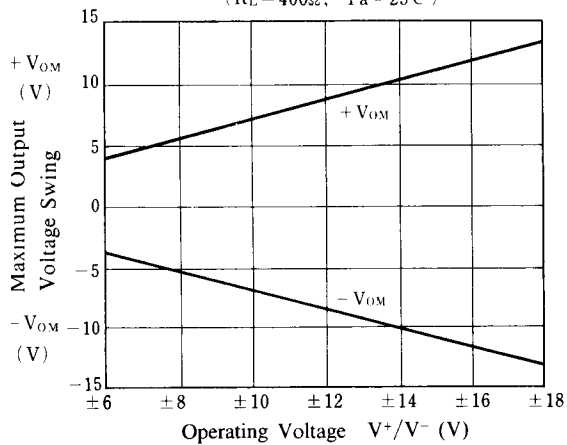
**Input Bias Current vs. Temperature**

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



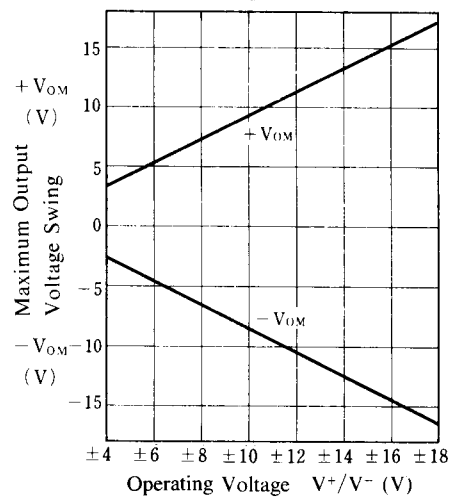
**Maximum Output Voltage Swing vs. Operating Voltage**

( $R_L = 400\Omega$ ,  $T_a = 25^\circ C$ )



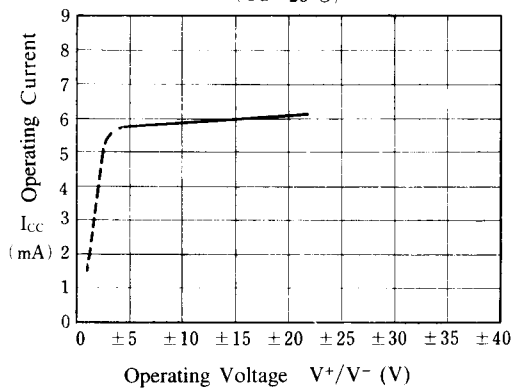
**Maximum Output Voltage Swing vs. Operating Voltage**

( $R_L = 2k\Omega$ )



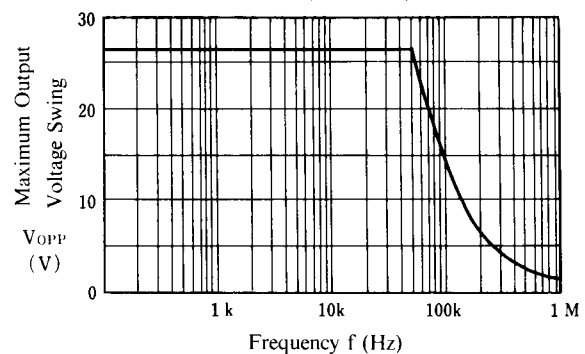
**Operating Current vs. Operating Voltage**

( $T_a = 25^\circ C$ )



**Maximum Output Voltage Swing vs. Frequency**

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



**[CAUTION]**

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