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New Japan Radio Co.,Ltd.

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## GENERAL PURPOSE QUAD OPERATIONAL AMPLIFIER

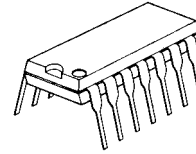
### ■ GENERAL DESCRIPTION

The NJM4741 consists of four independent high-gain operational amplifiers that are designed for high slew rate, wide band, and good noise characteristics.

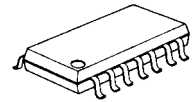
### ■ FEATURES

- Operating Voltage (  $\pm 4V \sim \pm 20V$  )
- Wide Band ( 3.5MHz typ. )
- Slew Rate ( 1.6V/ $\mu$ s typ. )
- Low Input Noise Voltage ( 9nV/ $\sqrt{\text{Hz}}$  typ. )
- Low Distortion ( 0.0005% typ. )
- Package Outline DIP14, DMP14
- Bipolar Technology

### ■ PACKAGE OUTLINE

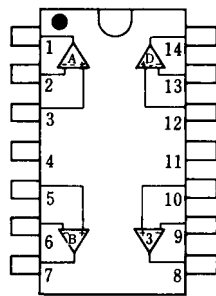


NJM4741D



NJM4741M

### ■ PIN CONFIGURATION

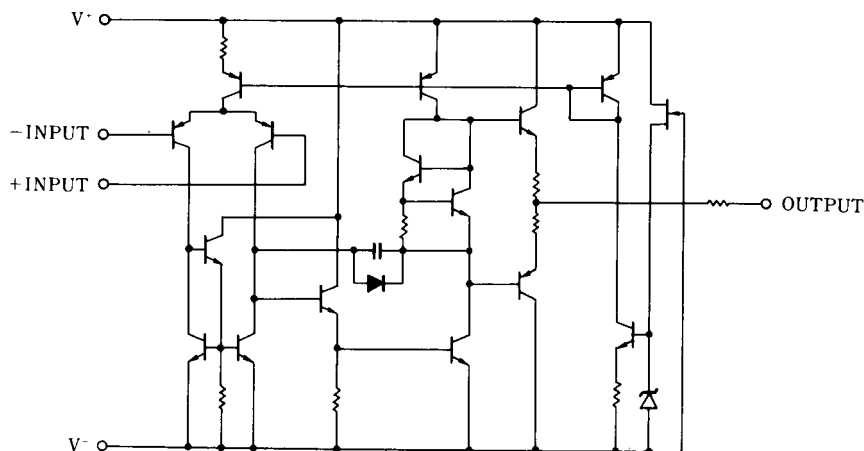


NJM4741D  
NJM4741M

### 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.C OUTPUT
- 9.C -INPUT
- 10.C +INPUT
- 11.V<sup>-</sup>
- 12.D +INPUT
- 13.D -INPUT
- 14.D OUTPUT

### ■ EQUIVALENT CIRCUIT ( 1/4 Shown )



# NJM4741

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+V^-$	± 20	V
Differential Input Voltage	$V_{ID}$	± 30	V
Input Voltage	$V_{IC}$	± 15 ( note )	V
Power Dissipation	$P_D$	( DIP14 ) 500 ( DMP14 ) 300	mW
Operating Temperature Range	$T_{opr}$	-40~+85	°C
Storage Temperature Range	$T_{stg}$	-40~+125	°C

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

## ■ ELECTRICAL CHARACTERISTICS

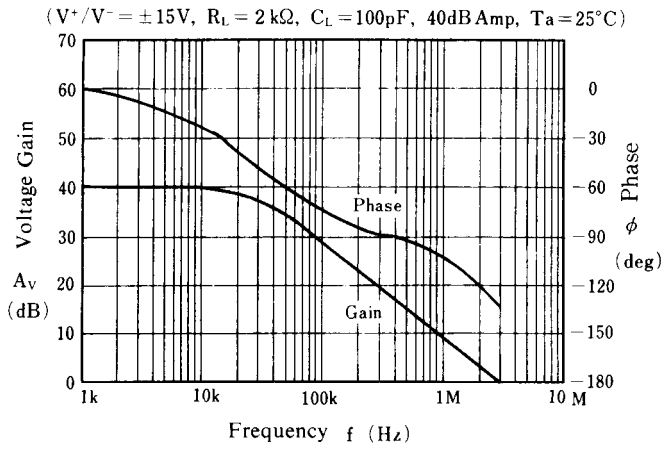
( Ta=25°C,  $V^+V^-$ =±15V )

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$V_{IO}$	$R_s \leq 100\Omega$	-	1.0	5.0	mV
Input Offset Current	$I_{IO}$		-	5	50	nA
Input Bias Current	$I_B$		-	60	300	nA
Large Signal Voltage Gain	$A_V$	$R_L \geq 2k\Omega, V_o = \pm 10V$	88	110	-	dB
Operating Current	$I_{CC}$		-	5	7	mA
Common Mode Rejection Ratio	CMR		80	120	-	dB
Supply Voltage Rejection Ratio	SVR		80	120	-	dB
Maximum Output Voltage 1	$V_{OM1}$	$R_L \geq 10k\Omega$	± 12	± 13.7	-	V
Maximum Output Voltage 2	$V_{OM2}$	$R_L \geq 2k\Omega$	± 10	± 12.5	-	V
Input Common Mode Voltage Range	$V_{ICM}$		± 12	± 14	-	V
Slew Rate	SR	$A_v = 1$	-	1.6	-	V/ $\mu$ s
Equivalent Input Noise Voltage	$e_n$	$f = 1kHz$	-	9	-	nV/ $\sqrt{Hz}$
Channel Separation	CS	$f = 10kHz, \text{Input Referred}$	-	108	-	dB

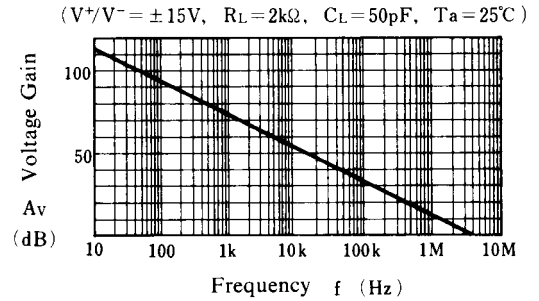
( note ) The application that leads to the extreme difference of power dissipation between channels may cause the mutual interference by the temperature gradient on the chip.

## ■ TYPICAL CHARACTERISTICS

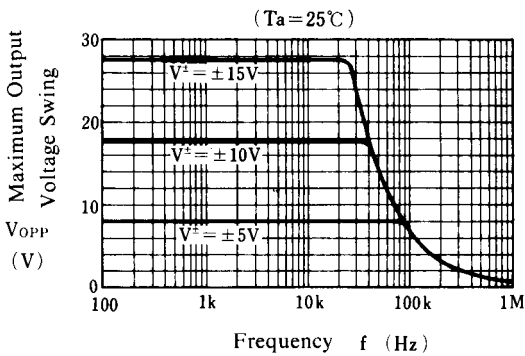
### Voltage Gain, Phase vs. Frequency



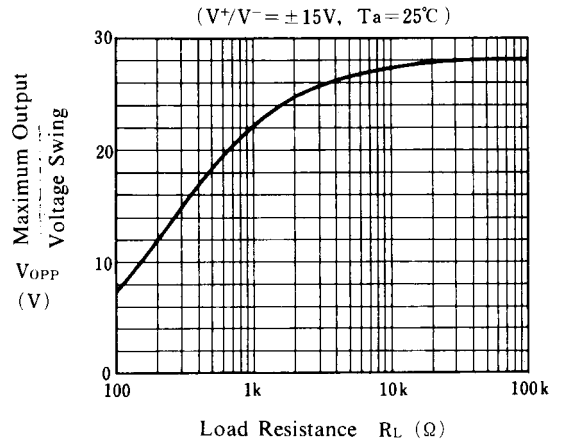
### Voltage Gain vs. Frequency



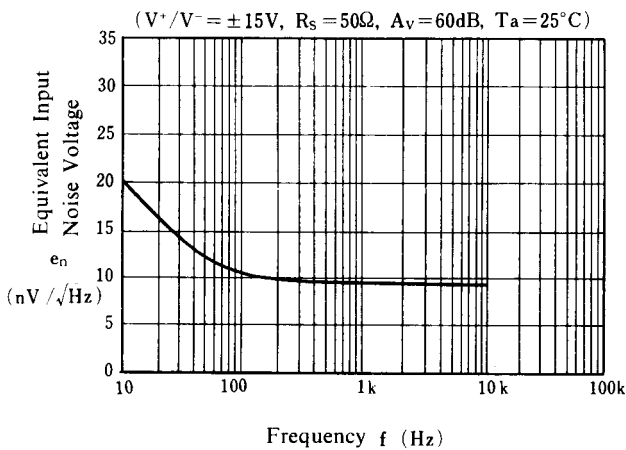
### Maximum Output Voltage Swing vs. Frequency



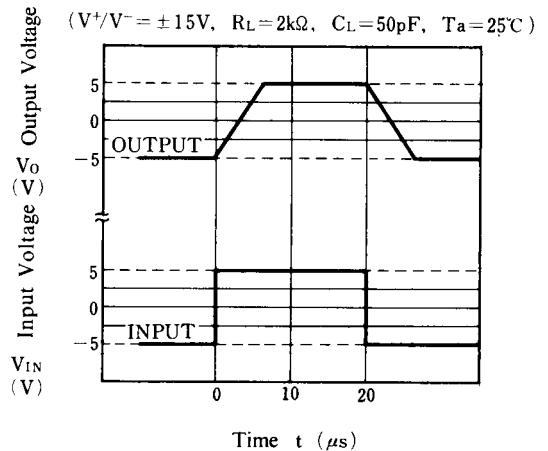
### Maximum Output Voltage Swing vs. Load Resistance



### Equivalent Input Noise Voltage vs. Frequency

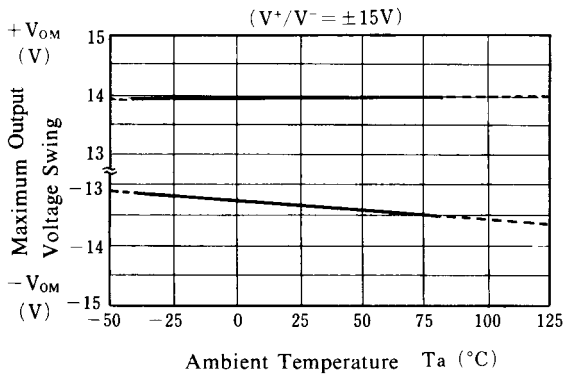


### Pulse Response

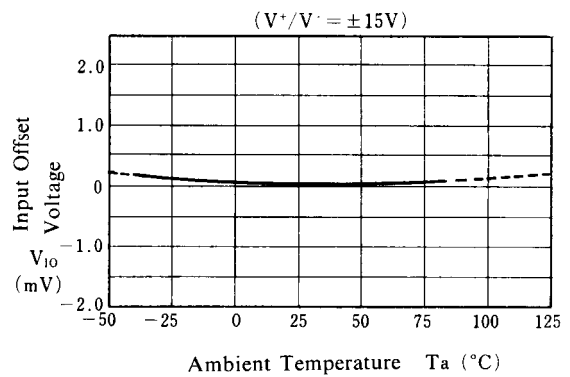


## ■ TYPICAL CHARACTERISTICS

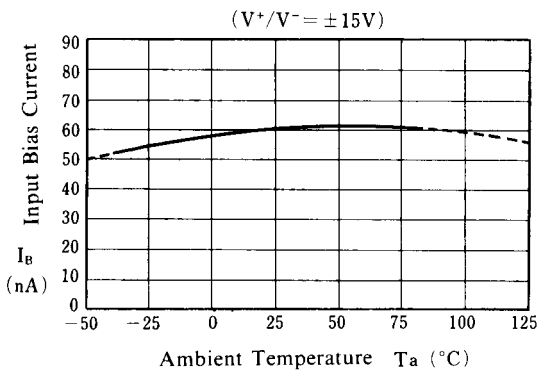
**Maximum Output Voltage Swing vs. Temperature**



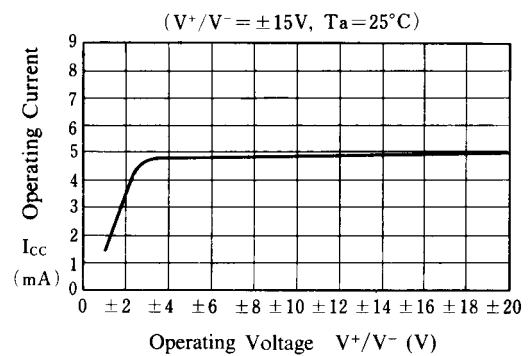
**Input Offset Voltage vs. Temperature**



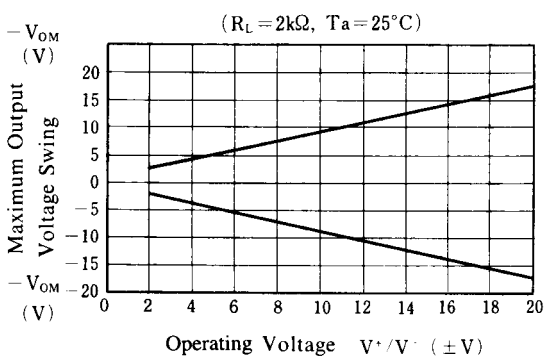
**Input Bias Current vs. Temperature**



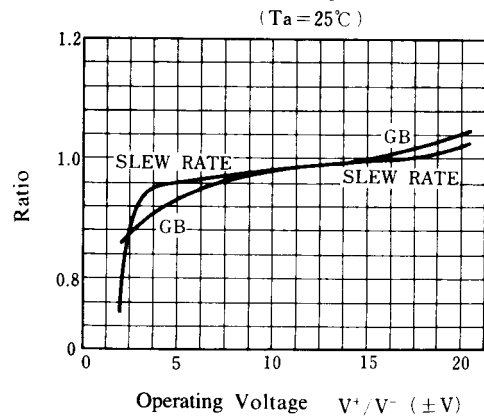
**Operating Current vs. Operating Voltage**



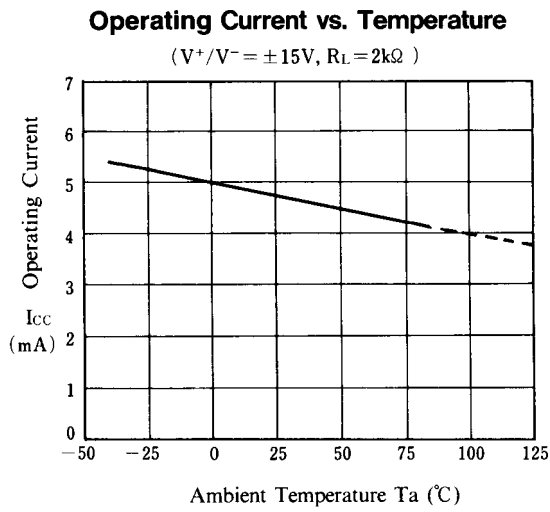
**Maximum Output Voltage Swing vs. Operating Voltage**



**Slew Rate, Unity Gain Bandwidth vs. Operating Voltage**



## ■ TYPICAL CHARACTERISTICS



**[CAUTION]**

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