

## NJM2068

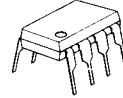
The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the NJM2068 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

### Absolute Maximum Ratings (Ta=25°C)

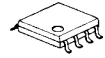
Supply Voltage	V <sup>+</sup> /V <sup>-</sup>	±18V
Input Voltage (note)	V <sub>IC</sub>	±15V
Differential Input Voltage	V <sub>ID</sub>	±30V
Power Dissipation	P <sub>D</sub> (D-Type)	500mW
	(M,E-Type)	300mW
	(L-Type)	800mW
Operating Temperature Range	T <sub>opr</sub>	-20~+75°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125°C

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

### Package Outline



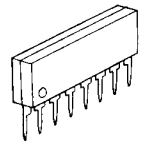
NJM2068D



NJM2068M



NJM2068E



NJM2068L

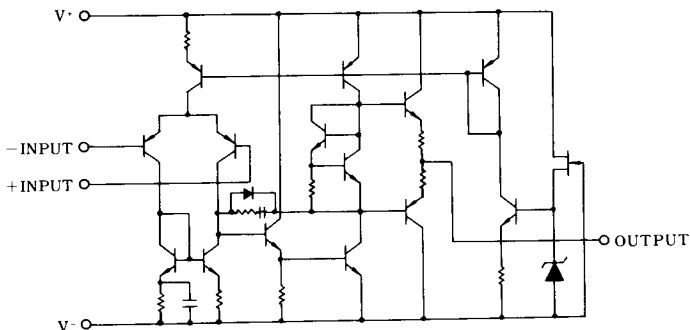
### Electrical Characteristics (Ta=25°C, V<sup>+</sup>/V<sup>-</sup> = ±15V)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> ≤ 10kΩ	—	0.3	3	mV
Input Offset Current	I <sub>IO</sub>		—	5	200	nA
Input Bias Current	I <sub>B</sub>		—	150	1000	nA
Input Resistance	R <sub>IN</sub>		50	300	—	kΩ
Large Signal Voltage Gain	A <sub>V</sub>	R <sub>L</sub> ≥ 2kΩ, V <sub>O</sub> = ±10V	90	120	—	dB
Maximum Output Voltage Swing	V <sub>OM</sub>	R <sub>L</sub> ≥ 2kΩ	±12	±13.5	—	V
Input Common Mode Voltage Range	V <sub>ICM</sub>		±12	±13.5	—	V
Common Mode Rejection Ratio	CMR	R <sub>S</sub> ≤ 10kΩ	80	110	—	dB
Supply Voltage Rejection Ratio	SVR	R <sub>S</sub> ≤ 10kΩ	80	120	—	dB
Slew Rate	SR	R <sub>L</sub> ≤ 2kΩ	—	7	—	V/μs
Gain Bandwidth Product 1	GB1	f = 10kHz	—	27	—	MHz
Gain Bandwidth Product 2	GB2	f = 100kHz	—	19	—	MHz
Unity Gain Bandwidth	f <sub>T</sub>	A <sub>V</sub> = 1	—	5.5	—	MHz
Total Harmonic Distortion	THD	A <sub>V</sub> = 20dB, V <sub>O</sub> = 5V, R <sub>L</sub> = 2kΩ, f = 1kHz	—	0.001	—	%
Equivalent Input Noise Voltage 1	V <sub>NI 1</sub>	FLAT+JISA, R <sub>S</sub> = 300Ω	—	0.44	0.56	μV
Equivalent Input Noise Voltage 2	V <sub>NI 2</sub> *	RIAA R <sub>S</sub> = 2.2KΩ, 30kHz LPF	—	0.75	1.4	μV
Supply Current	I <sub>CC</sub>		—	5.0	8.0	mA

\* Applies to noise D rank only.

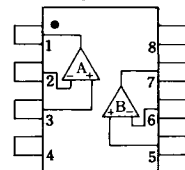
(Note) Insert an about 470Ω resistor in series with the output, if a capacitive load of higher than 150pF is connected with the voltage follower.

### Equivalent Circuit (1/2 Shown)



### Connection Diagram

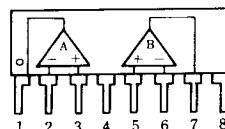
D,M,E-Type  
(Top View)



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>

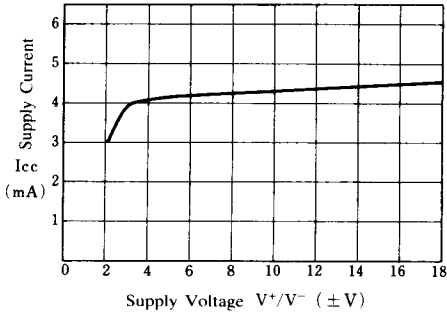
L-Type



■ Typical Characteristics

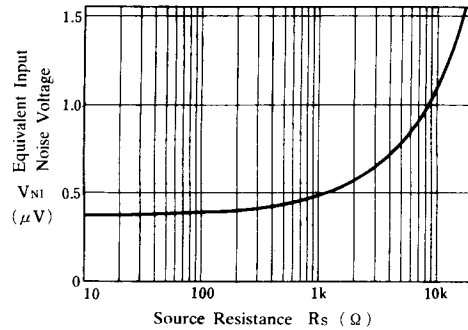
**Supply Current vs. Supply Voltage**

(No Input Signal,  $R_L = \infty$ ,  $T_a = 25^\circ\text{C}$ )



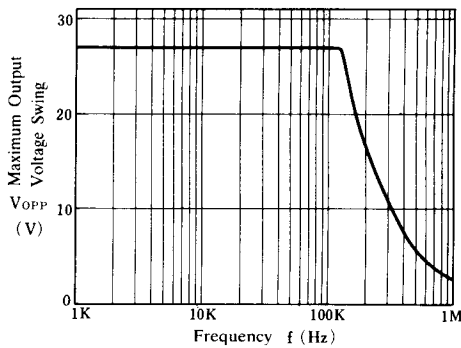
**Equivalent Input Noise Voltage vs. Source Resistance**

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



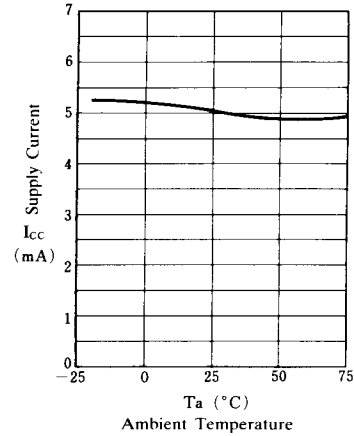
**Maximum Output Voltage Swing vs. Frequency**

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



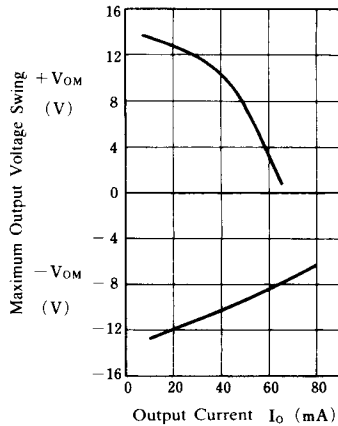
**Supply Current vs. Temperature**

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



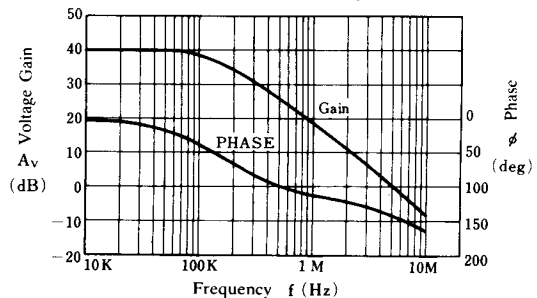
**Maximum Output Voltage Swing**

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



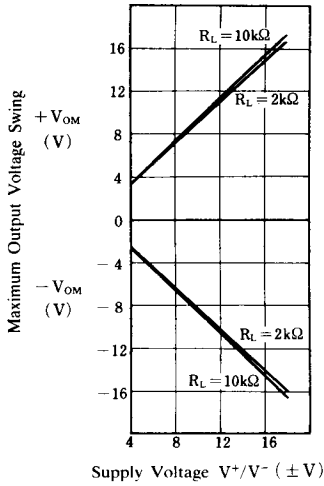
**Voltage Gain, Phase vs. Frequency**

( $V^+/V^- = \pm 15\text{V}$ ,  $R_L = 2\text{k}\Omega$ ,  $C_L = 100\text{pF}$ , 40dB Amp,  $T_a = 25^\circ\text{C}$ )



## ■ Typical Characteristics

**Maximum Output Voltage Swing**  
( $T_a = 25^\circ\text{C}$ )



**Maximum Output Voltage Swing**  
( $V^+/V^- = \pm 15\text{V}$ ,  $T_a = 25^\circ\text{C}$ )

