

## DUAL SINGLE-SUPPLY OPERATIONAL AMPLIFIER

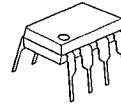
### ■ GENERAL DESCRIPTION

NJM 2119 is a ultra-low input offset voltage and bias current, low drift and single supply dual operational amplifier. NJM2119 is suitable for a high accurated instrumental amplifier and sensor amplifier.

### ■ FEATURES

- Single Supply
- Operating Voltage (4V ~ +36V)
- Low Input Offset Voltage (90  $\mu$ V Typ.)
- Low Input Bias Current (18nA Typ.)
- Low Input Offset Voltage Drift (4.0  $\mu$ V/ $^{\circ}$ C Typ.)
- Package Outline .DIP8, DMP8
- Bipolar Technology

### ■ PACKAGE OUTLINE

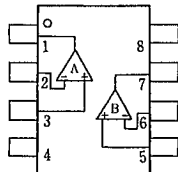


NJM2119D



NJM2119M

### ■ PIN CONFIGURATION


 NJM2119D  
 NJM2119M

### 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>

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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                   | SYMBOL           | RATINGS    | UNIT |
|-----------------------------|------------------|------------|------|
| Supply Voltage              | V*(V+/V-)        | 36(±18)    | V    |
| Differential Input Voltage  | V <sub>ID</sub>  | -0.3~+36   | V    |
| Input Voltage               | V <sub>IC</sub>  | +36 (note) | V    |
| Power Dissipation           | P <sub>D</sub>   | (DIP8) 700 | mW   |
|                             |                  | (DMP8) 300 | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -30~+85    | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40~+125   | °C   |

(note) For supply voltage less than ±18V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=5.0V, Ta=25±2°C)

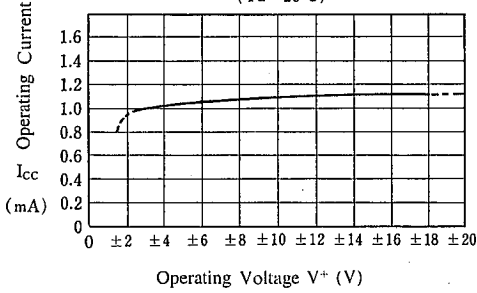
| PARAMETER                       | SYMBOL               | TEST CONDITION          | MIN.  | TYP. | MAX. | UNIT  |
|---------------------------------|----------------------|-------------------------|-------|------|------|-------|
| Input Offset Voltage            | V <sub>IO</sub>      | R <sub>S</sub> ≤ 50Ω    | —     | 90   | 450  | μV    |
| V <sub>IO</sub> Drift           | ΔV <sub>IO</sub> /ΔT | Ta=-30~+85°C            | —     | 4.0  | —    | μV/°C |
| Input Offset Current            | I <sub>IO</sub>      |                         | —     | 0.3  | 7.0  | nA    |
| Input Bias Current              | I <sub>B</sub>       |                         | —     | 18   | 50   | nA    |
| Operating Current               | I <sub>CC</sub>      | R <sub>L</sub> = ∞      | —     | 1.0  | 1.5  | mA    |
| Input Common Mode Voltage Range | V <sub>ICM</sub>     |                         | 0~3.5 | —    | —    | V     |
| Common Mode Rejection Ratio     | CMR                  |                         | 85    | 100  | —    | dB    |
| Supply Voltage Rejection Ratio  | SVR                  |                         | 85    | 100  | —    | dB    |
| Large Signal Voltage Gain       | A <sub>V</sub>       | R <sub>L</sub> = 600Ω   | 90    | 105  | —    | dB    |
| Maximum Output Voltage Swing 1  | +V <sub>OM1</sub>    | R <sub>L</sub> = 600Ω   | 3.4   | 4.0  | —    | V     |
| Maximum Output Voltage Swing 1  | -V <sub>OM1</sub>    | R <sub>L</sub> = 600Ω   | —     | 5.0  | 10.0 | mV    |
| Maximum Output Voltage Swing 2  | -V <sub>OM2</sub>    | I <sub>SINK</sub> = 1mA | —     | 220  | 350  | mV    |
| Slew Rate                       | SR                   | A <sub>V</sub> = 1      | —     | 0.3  | —    | V/μs  |
| Gain Bandwidth Product          | GB                   |                         | —     | 1.0  | —    | MHz   |

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## ■ TYPICAL CHARACTERISTICS

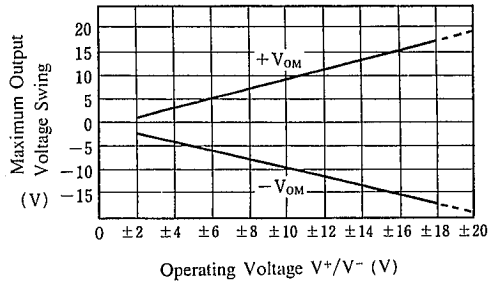
### Operating Current vs. Operating Voltage

( $T_a = 25^\circ\text{C}$ )



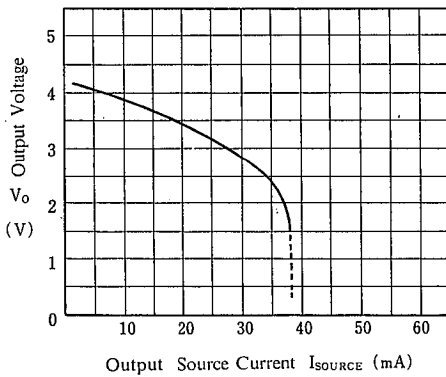
### Maximum Output Voltage Swing vs. Operating Voltage

( $T_a = 25^\circ\text{C}$ ,  $R_L = 2\text{k}\Omega$ )



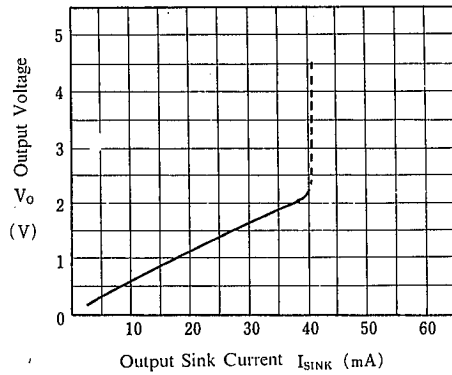
### Output Source Current

( $V^+ = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$ )



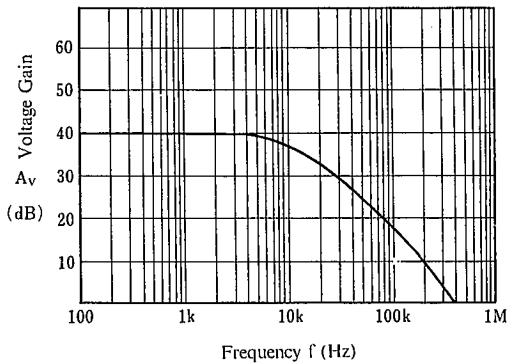
### Output Sink Current

( $V^+ = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$ )



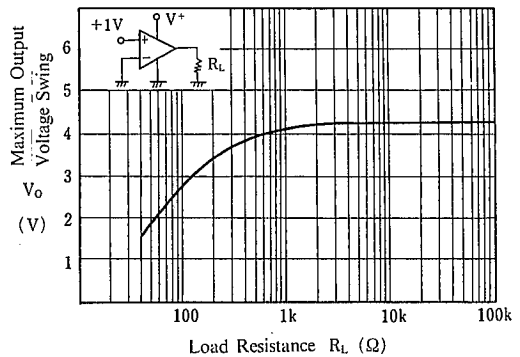
### Voltage Gain vs. Frequency

( $V^+/V^- = \pm 2.5\text{V}$ ,  $R_L = 2\text{k}\Omega$ ,  $A_v = 40\text{dB}$ ,  $T_a = 25^\circ\text{C}$ )

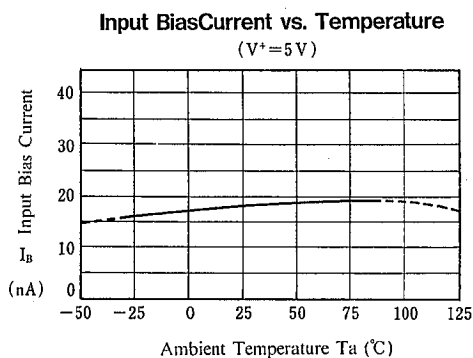
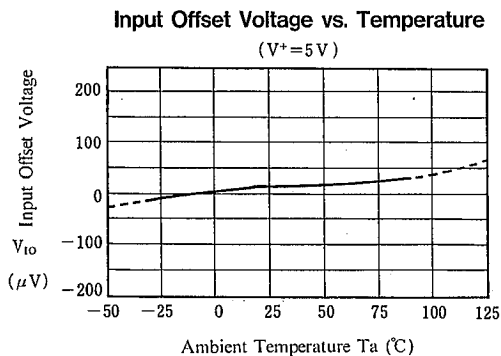
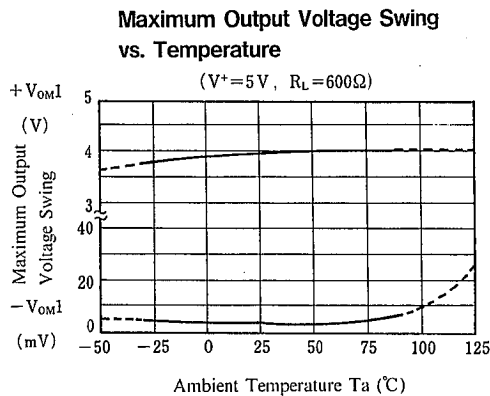
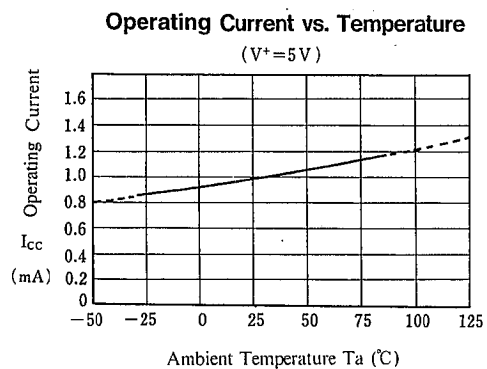


### Maximum Output Voltage Swing vs. Load Resistance

( $V^+ = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$ )



■ TYPICAL CHARACTERISTICS



## MEMO

**[CAUTION]**

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