# DUAL SINGLE-SUPPLY OPERATIONAL AMPLIFIER

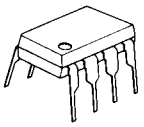
## ■ GENERAL DESCRIPTION

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

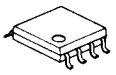
## ■ FEATURES

- Single Supply
- Operating Voltage ( +4V~+36V )
- Low Input Offset Voltage ( 90μV typ. )
- Low Input Bias Current ( 18nA typ. )
- Low Input Offset Voltage Drift ( 4.0μV/˚C typ. )
- Package Outline DIP8,DMP8
- Bipolar Technology

## ■ PACKAGE OUTLINE

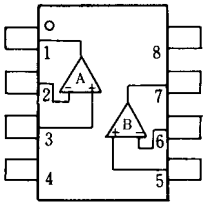


NJM2119D



NJM2119M

## ■ PIN CONFIGURATION




NJM2119D
NJM2119M

**PIN FUNCTION**
**1.A OUTPUT**
**2.A –INPUT**
**3.A +INPUT**
**4.$V^-$**
**5.B +INPUT**
**6.B –INPUT**
**7.B OUTPUT**
**8.$V^+$**

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25˚C )

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Supply Voltage | $V^+(V^+/V^-)$ | 36 ( ± 18 ) | V |
| Input Voltage | $V_{IC}$ | -0.3~+36 | V |
| Differential Input Voltage | $V_{ID}$ | ± 36 ( note ) | V |
| Power Dissipation | $P_D$ | ( DIP8 ) 700<br>( DMP8 ) 300 | mW |
| Operating Temperature Range | $T_{opr}$ | -40~+85 | ˚C |
| Storage Temperature Range | $T_{stg}$ | -40~+125 | ˚C |

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

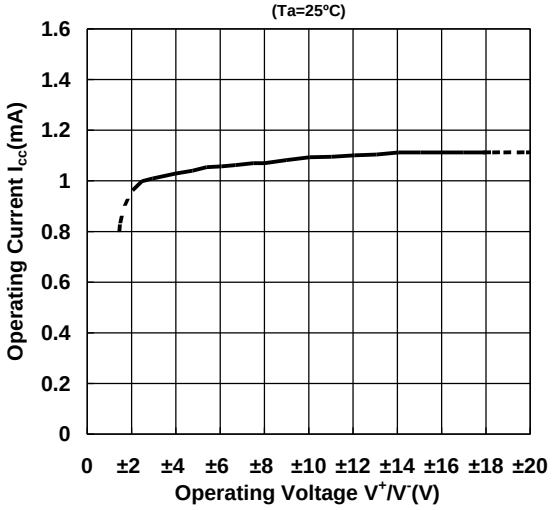
## ■ ELECTRICAL CHARACTERISTICS

( $V^+$=5.0V,Ta=25±2˚C )

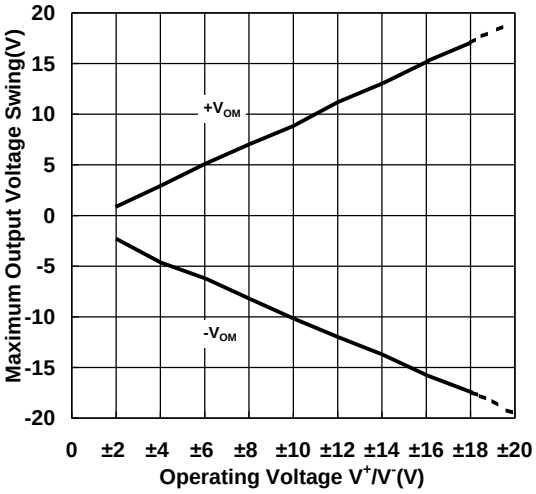
| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Input Offset Voltage | $V_{IO}$ | $R_S$≦50Ω | - | 90 | 450 | μV |
| $V_{IO}$ Drift | $\Delta V_{IO}/\Delta T$ | Ta=-30~+85˚C | - | 4.0 | - | μV/˚C |
| Input Offset Current | $I_{IO}$ | | - | 0.3 | 7.0 | nA |
| Input Bias Current | $I_B$ | | - | 18 | 50 | nA |
| Operating Current | $I_{CC}$ | $R_L$=∞ | - | 1.0 | 1.5 | mA |
| Input Common Mode Voltage Range | $V_{ICM}$ | | 0~3.5 | - | - | V |
| Common Mode Rejection Ratio | CMR | | 85 | 100 | - | dB |
| Supply Voltage Rejection Ratio | SVR | | 85 | 100 | - | dB |
| Large Signal Voltage Gain | $A_V$ | $R_L$=600Ω | 90 | 105 | - | dB |
| Maximum Output Voltage Swing 1 | $+V_{OM1}$ | $R_L$=600Ω | 3.4 | 4.0 | - | V |
| Maximum Output Voltage Swing 1 | $-V_{OM1}$ | $R_L$=600Ω | - | 5.0 | 10.0 | mV |
| Maximum Output Voltage Swing 2 | $-V_{OM2}$ | $I_{SINK}$=1mA | - | 220 | 350 | mV |
| Slew Rate | SR | $A_V$=1 | - | 0.3 | - | V/μs |
| Gain Bandwidth Product | GB | | - | 1.0 | - | MHz |

## ■ TYPICAL CHARACTERISTICS

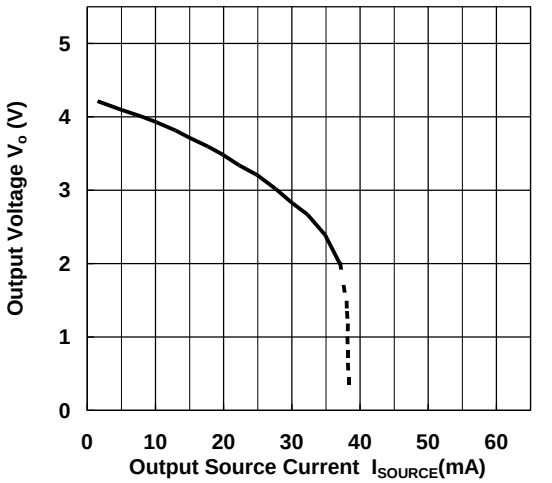
**Operating Current vs. Operating Voltage**
(Ta=25ºC)



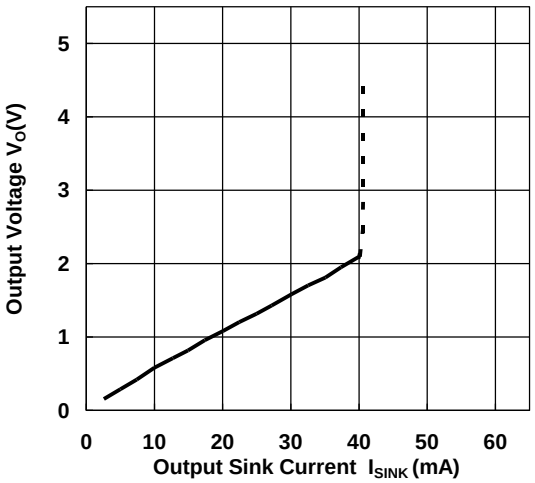

**Maximum Output Voltage Swing vs. Operating Voltage**
(Ta=25ºC, $R_L$=2KΩ)



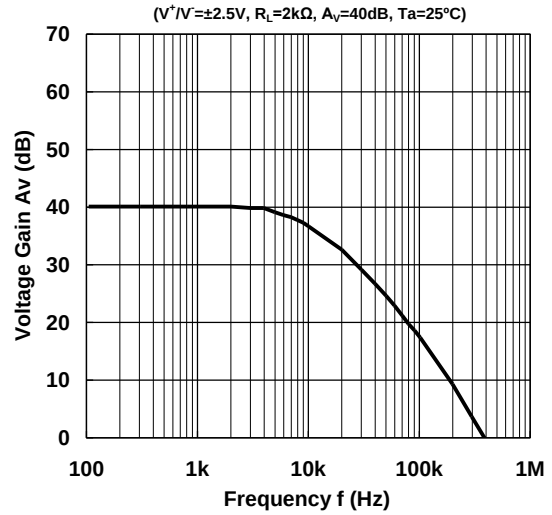

**Output Source Current**
($V^+$=5V, Ta=25ºC)



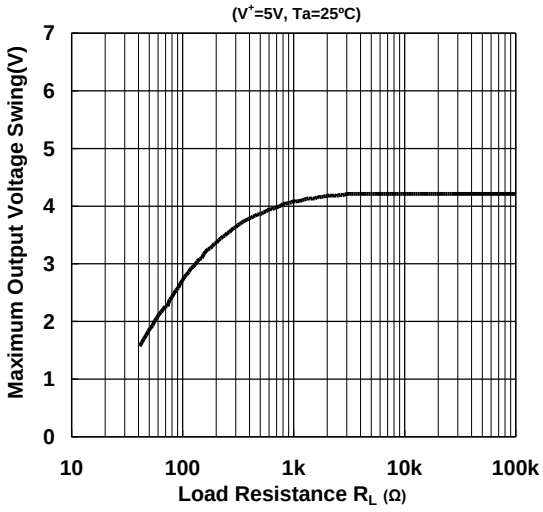

**Output Sink Current**
($V^+$=5V, Ta=25ºC)




**Voltage Gain vs. Frequency**
($V^+/V^-$=±2.5V, $R_L$=2kΩ, $A_V$=40dB, Ta=25ºC)



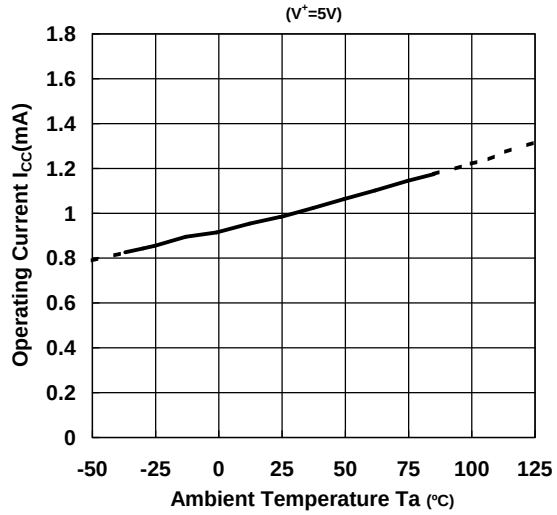

**Maximum Output Voltage Swing vs. Load Resistance**
($V^+$=5V, Ta=25ºC)



## ■ TYPICAL CHARACTERISTICS

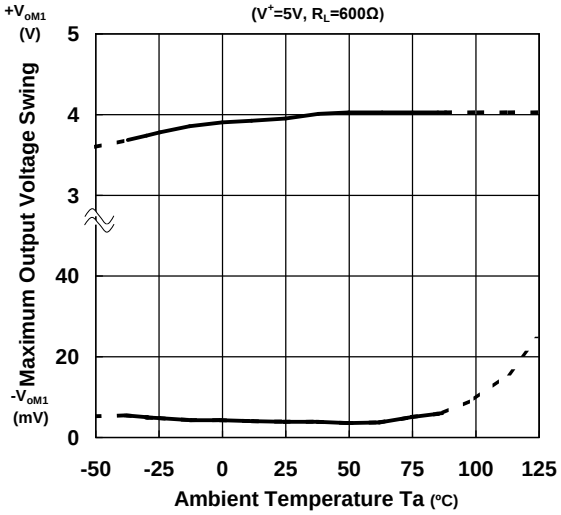
**Operating Current vs. Temperature**

($V^+$=5V)



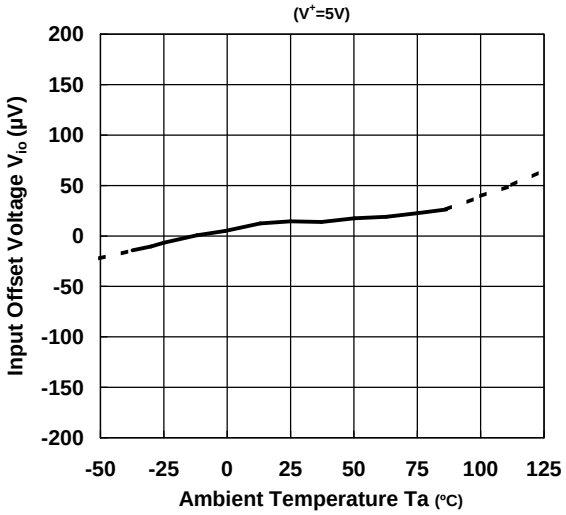

**Maximum Output Voltage Swing vs. Temperature**

($V^+$=5V, $R_L$=600Ω)



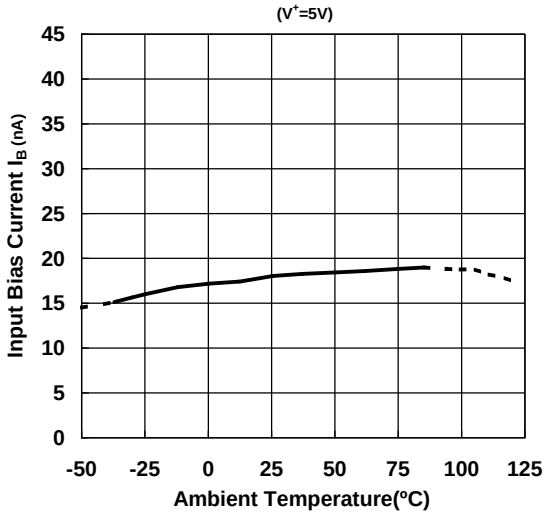

**Input Offset Voltage vs. Temperature**

($V^+$=5V)




**Input Bias Current vs. Temperature**

($V^+$=5V)



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