

## DUAL SINGLE-SUPPLY OPERATIONAL AMPLIFIER

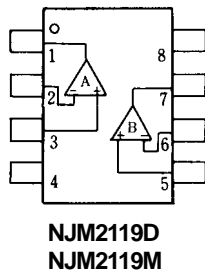
### ■ GENERAL DESCRIPTION

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.

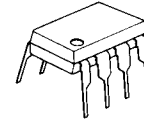
### ■ FEATURES

- Single Supply
- Operating Voltage ( +4V~+36V )
- Low Input Offset Voltage ( 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

### ■ PIN CONFIGURATION



### ■ PACKAGE OUTLINE



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>

# NJM2119

## ■ 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 ( 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.

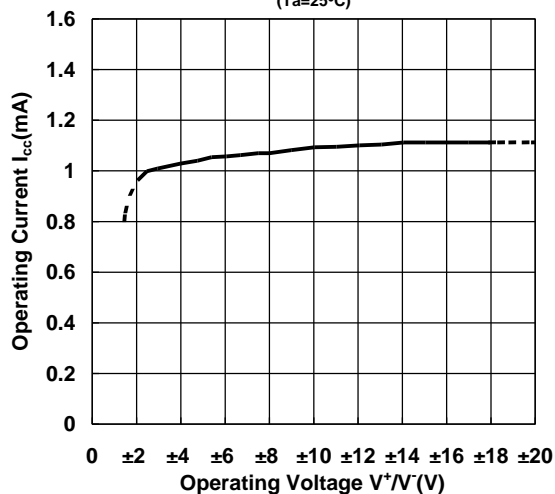
## ■ ELECTRICAL CHARACTERISTICS

(  $V^+=5.0V, Ta=25\pm 2^\circ C$  )

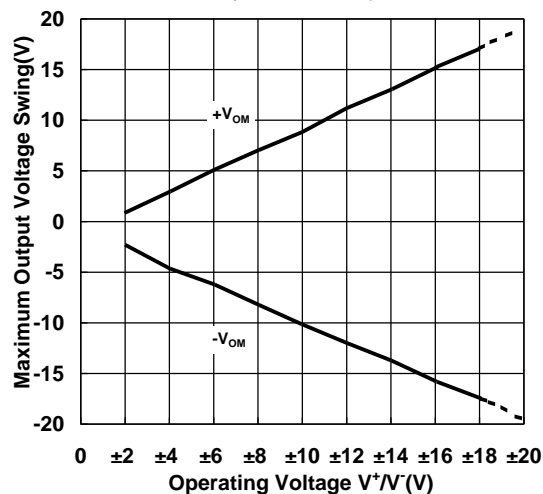
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$V_{IO}$	$R_S \leq 50\Omega$	-	90	450	$\mu V$
$V_{IO}$ Drift	$\Delta V_{IO}/\Delta T$	$T_a = -30 \sim +85^\circ C$	-	4.0	-	$\mu V/^\circ C$
Input Offset Current	$I_{IO}$		-	0.3	7.0	nA
Input Bias Current	$I_B$		-	18	50	nA
Operating Current	$I_{CC}$	$R_L = \infty$	-	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	$A_V$	$R_L = 600\Omega$	90	105	-	dB
Maximum Output Voltage Swing 1	$+V_{OM1}$	$R_L = 600\Omega$	3.4	4.0	-	V
Maximum Output Voltage Swing 1	$-V_{OM1}$	$R_L = 600\Omega$	-	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/ $\mu s$
Gain Bandwidth Product	GB		-	1.0	-	MHz

## ■ TYPICAL CHARACTERISTICS

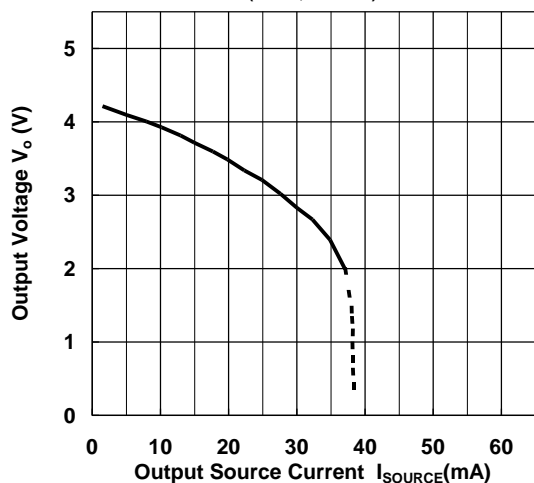
Operating Current vs. Operating Voltage  
( $T_a=25^\circ\text{C}$ )



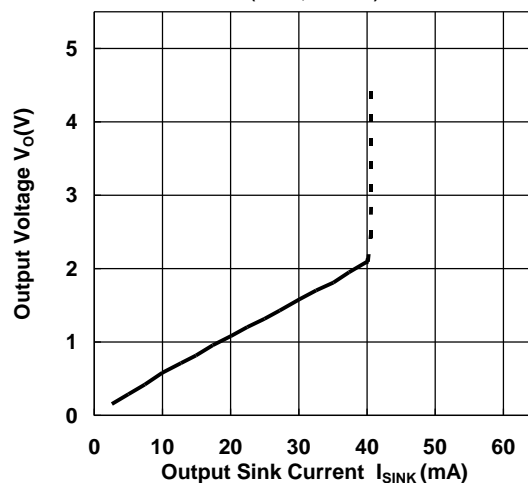
Maximum Output Voltage Swing vs. Operating Voltage  
( $T_a=25^\circ\text{C}$ ,  $R_L=2\text{k}\Omega$ )



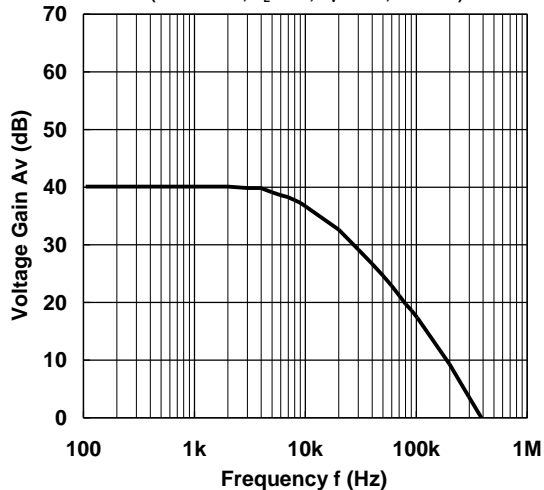
Output Source Current  
( $V^+=5\text{V}$ ,  $T_a=25^\circ\text{C}$ )



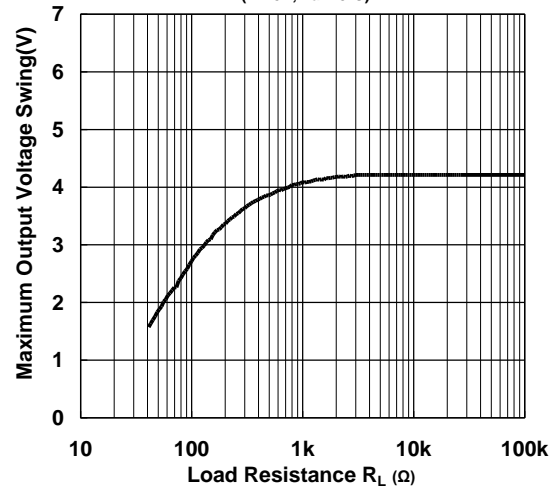
Output Sink Current  
( $V^+=5\text{V}$ ,  $T_a=25^\circ\text{C}$ )



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

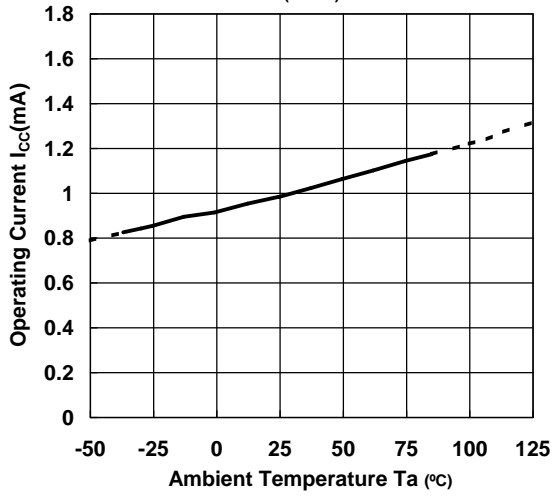


Maximum Output Voltage Swing vs. Load Resistance  
( $V^+=5\text{V}$ ,  $T_a=25^\circ\text{C}$ )

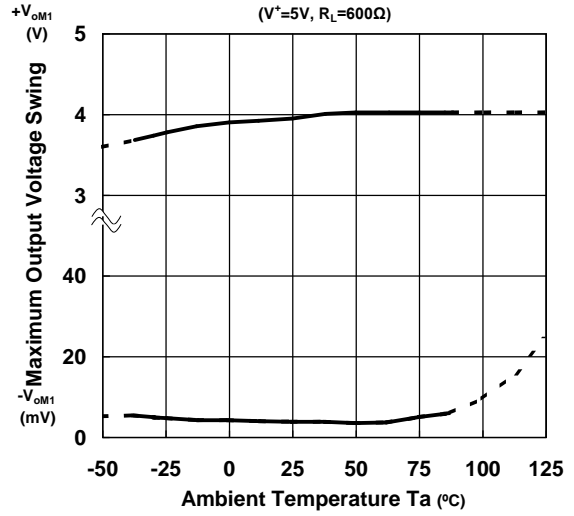


## ■ TYPICAL CHARACTERISTICS

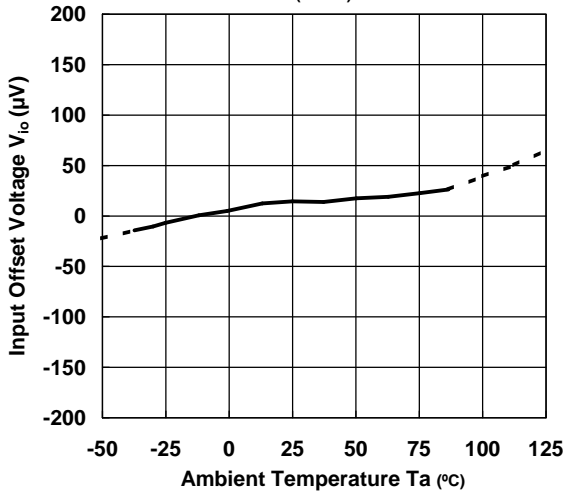
Operating Current vs. Temperature  
( $V^+=5V$ )



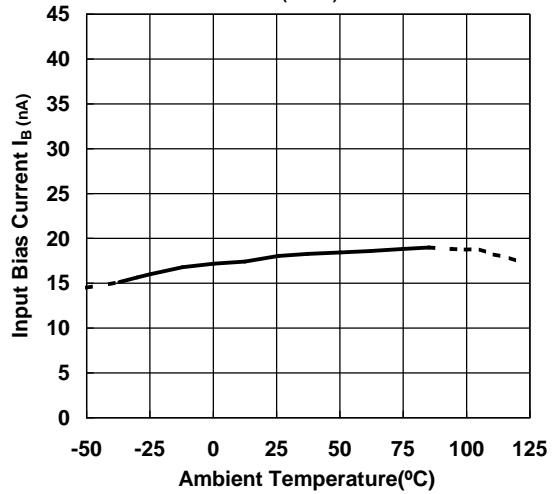
Maximum Output Voltage Swing vs. Temperature  
( $V^+=5V, R_L=600\Omega$ )



Input Offset Voltage vs. Temperature  
( $V^+=5V$ )



Input Bias Current vs. Temperature  
( $V^+=5V$ )





**[CAUTION]**

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