Single Ultra-High speed and Wide Band Operational Amplifier

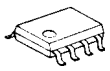
■ GENERAL DESCRIPTION

The **NJM2722** is single and ultra-high speed and wide band operational amplifier.

The NJM2722 is 1000V/μs slew rate and 1kΩ load drive is possible, at supply voltage of ±4.5V.

The NJM2722 is suitable for video signal processing, video buffer, pulse amplifiers, ADC input buffer, measuring instrument, and digital communication.

■ PACKAGE OUTLINE



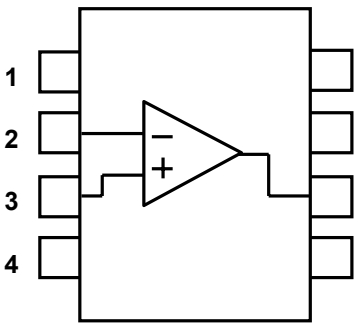
NJM2722E

■ FEATURES

- ●Operating Voltage : ±2.5V to ±5.0V
- ●Slew Rate : 1000V/μs Typ. (at V^+/V^-=±4.5V, R_L=1kΩ)
- ●Unity-Gain : 170MHz Typ.
- ●Output Voltage : V_{OH} = +3.2V Typ. (at V^+/V^-=±4.5V, R_L=1kΩ)
  : V_{OL} = -3.2V Typ. (at V^+/V^-=±4.5V, R_L=1kΩ)
- ●Offset Voltage : 5mV Typ.
- ●Operating Current : 16.5 mA Typ.
- ●Adequate phase margin : Φ_M=70deg. Typ. (at R_L=2kΩ, voltage follower)
- ●Bipolar Technology
- ●Package Outline :EMP8

■ FEATURES

(Top View)



EMP8

PIN FUNCTION.

1. NC
2. -INPUT
3. +INPUT
4. V^-
5. NC
6. OUTPUT
7. V^+
8. NC

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	11.0	V
Power Dissipation	P_D	EMP8: 910 (Note1)	mW
Differential Input Voltage Range	V_{ID}	±3.0	V
Common Mode Input Voltage Range	V_{ICM}	11.0	V
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-40 to +150	°C

(Note 1) On the PCB " EIA/JEDEC (76.2x11.43x1.6mm, four layers, FR-4) "

■ RECOMMENDED OPERATING CONDITION

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V^+/V^-	±2.5 to ±5.0	V

■ ELECTRICAL CHARACTERISTICS

●DC CHARACTERISTICS (V^+/V^-=±2.5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	No Signal	-	16.5	25.5	mA
Input Offset Voltage	V_{IO}		-	5.0	28.0	mV
Input Bias Current	I_B		-	25.5	70.0	µA
Input Offset Current	I_{IO}		-	0.3	1.7	µA
Large Signal Voltage Gain	A_V	R_L=2kΩ (Note 2)	50	60	-	dB
Input Common Mode Voltage Range	V_{ICM}	V^+/V^- = ±4.5V	+3.1 -2.7	+3.5 -3.0	- -	V V
Common Mode Rejection Ratio	CMR	V^+/V^- = ±4.5V -2.7V≤ V_{ICM} ≤+3.1V	60	80	-	dB
Supply Voltage Rejection Ratio	SVR	±2.5V≤V^+/V^-≤±5.0V	50	60	-	dB
Maximum Output Voltage Swing	V_{OM}	V^+/V^- = ±4.5V , R_L=1kΩ	±2.9	±3.2	-	V

(Note 2) When using NJM2722, the closed gain should be 40dB or lower.

●AC CHARACTERISTICS (V^+/V^-=±4.5V, Ta=25°C)

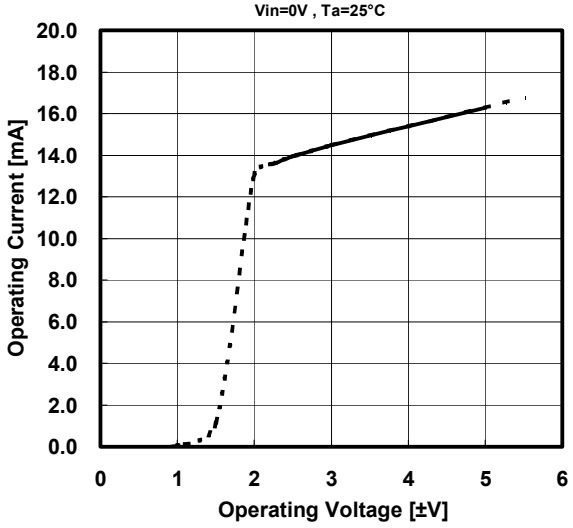
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Unity Gain Frequency	f_T	A_V=40dB, R_F=1.98kΩ R_G=20Ω, R_L=∞, C_L=5pF	-	170	-	MHz
Phase Margin	Φ_M	A_V=40dB, R_F=1.98kΩ R_G=20Ω, R_L=∞, C_L=5pF	-	70.0	-	Deg

●AC CHARACTERISTICS (V^+/V^-=±4.5V, Ta=25°C)

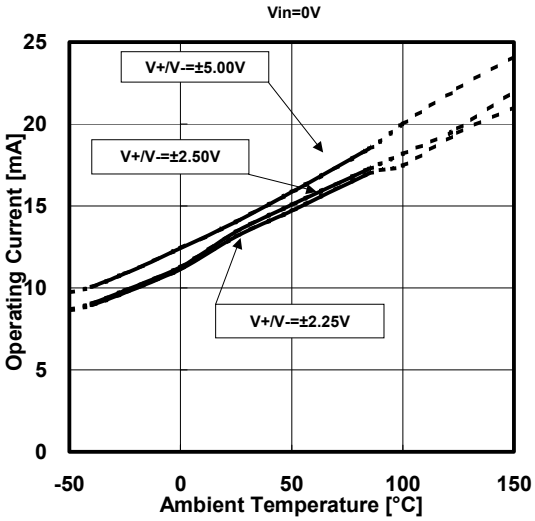
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	A_V=0dB, R_F=0Ω, R_G=∞ R_L=1kΩ, C_L=1.5pF V_{IN}=4V_{PP}	-	1000	-	V/µs

■ TYPICAL CHARACTERISTICS

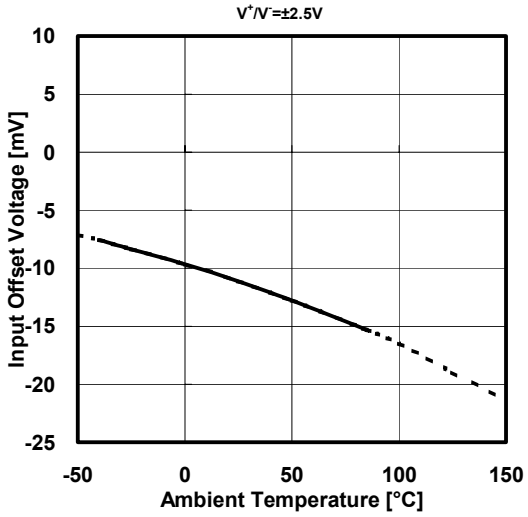
Maximum Output Voltage Swing vs. Operating Voltage



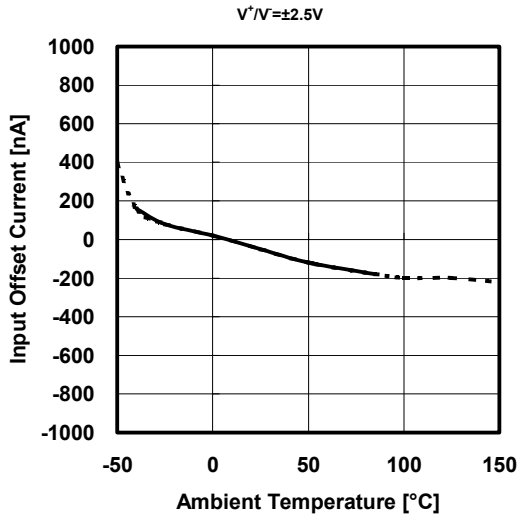
Operating Current vs. Ambient Temperature



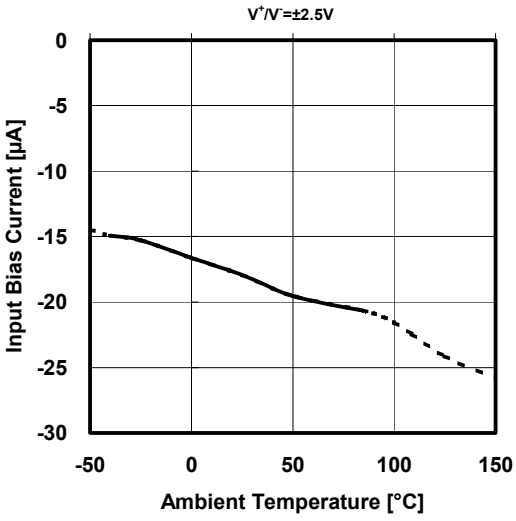
Input Offset Voltage vs. Ambient Temperature



Input Offset Current vs. Ambient Temperature



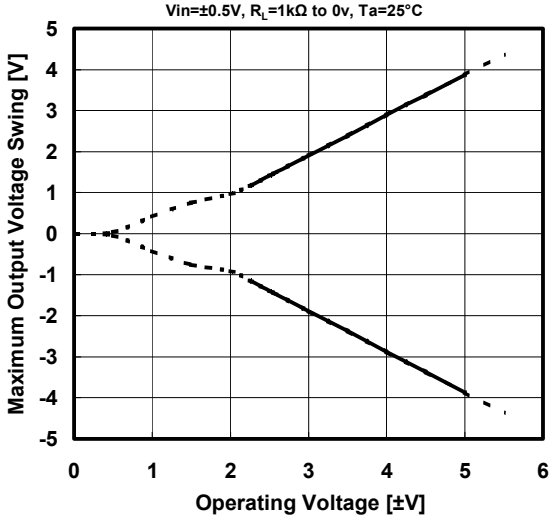
Input Bias Current vs. Ambient Temperature



■ TYPICAL CHARACTERISTICS

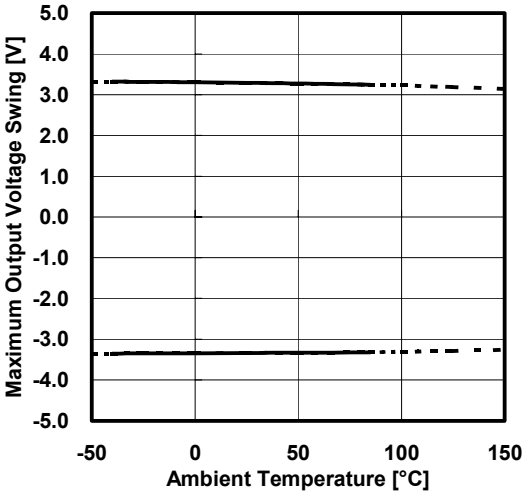
Maximum Output Voltage Swing vs. Operating Voltage

Vin=±0.5V, R_L=1kΩ to 0v, Ta=25°C



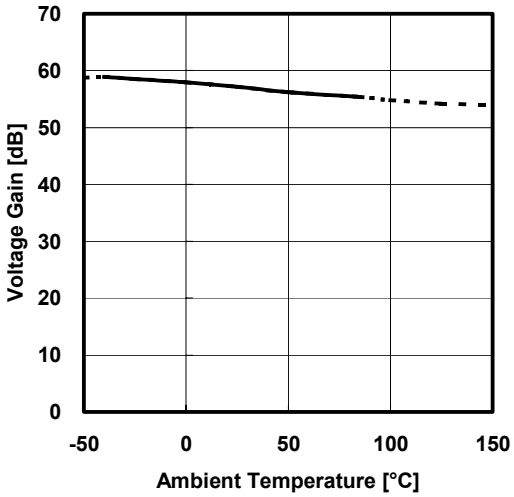
Maximum Output Voltage Swing vs. Ambient Temperature

V^+/V^-=±4.5V, Gv=Open, Vin=±0.5V, R_L=1kΩ to 0v



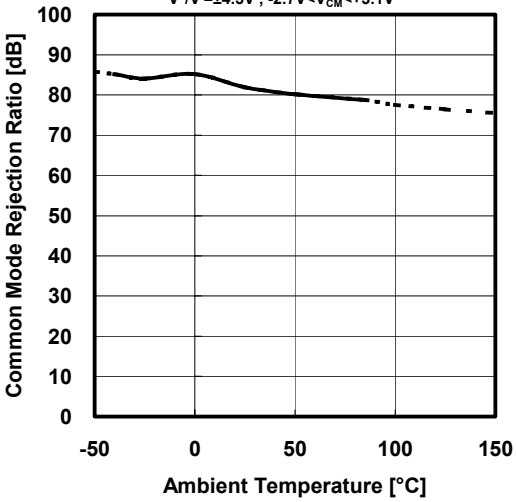
Voltage Gain vs. Ambient Temperature

V^+/V^-=±2.5V, R_L=2kΩ



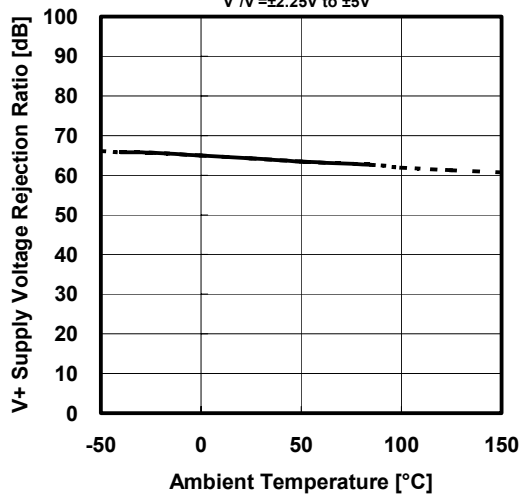
Common Mode Rejection Ratio vs. Ambient Temperature

V^+/V^-=±4.5V , -2.7V<V_{CM}<+3.1V



V+ Supply Voltage Rejection Ratio vs. Ambient Temperature

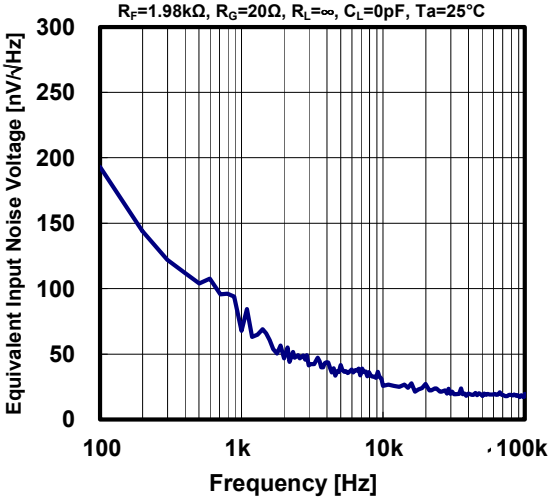
V^+/V^-=±2.25V to ±5V



Equivalent Input Noise Voltage vs. Frequency

V^+/V^-=±2.5V, V_{IN}=50Ω to GND, G_V=100, R_S=50Ω

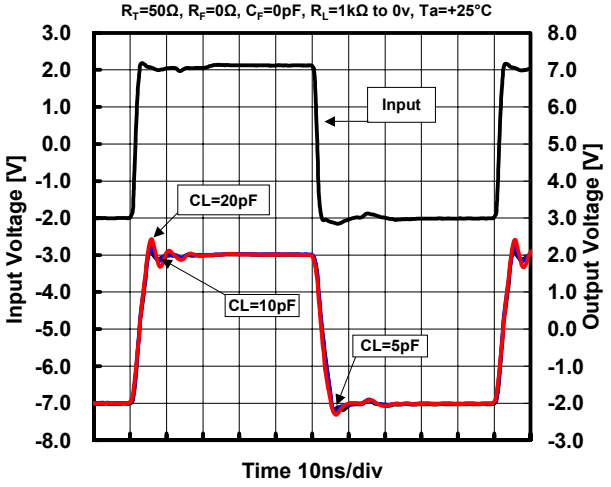
R_F=1.98kΩ, R_G=20Ω, R_L=∞, C_L=0pF, Ta=25°C



■ TYPICAL CHARACTERISTICS

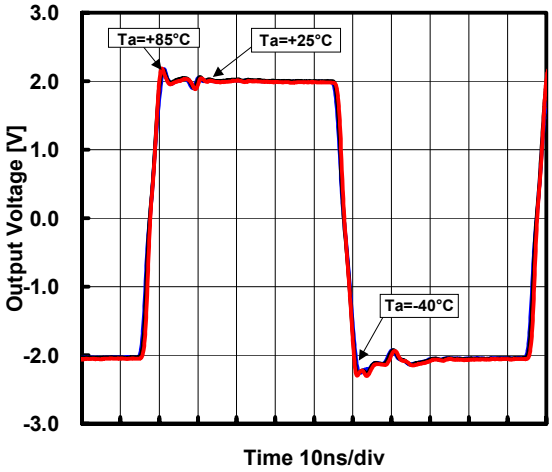
Pulse Response (with Cpacitive load)

V^+/V^-=±4.5V, f=10MHz, V_O=4V_{PP}, G_V=0dB
R_T=50Ω, R_F=0Ω, C_F=0pF, R_L=1kΩ to 0v, Ta=+25°C



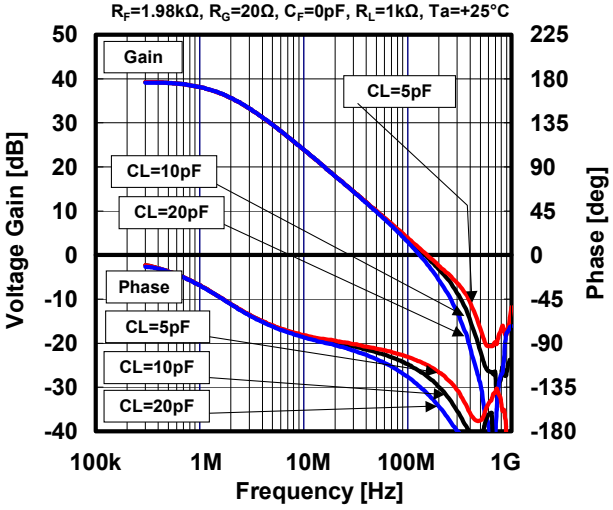
Pulse Response (correlation with Ta)

V^+/V^-=±4.5V, f=10MHz, V_O=4V_{PP}, G_V=0dB
R_T=50Ω, R_F=0Ω, C_F=0pF, C_L=5pF, R_L=1kΩ to 0v



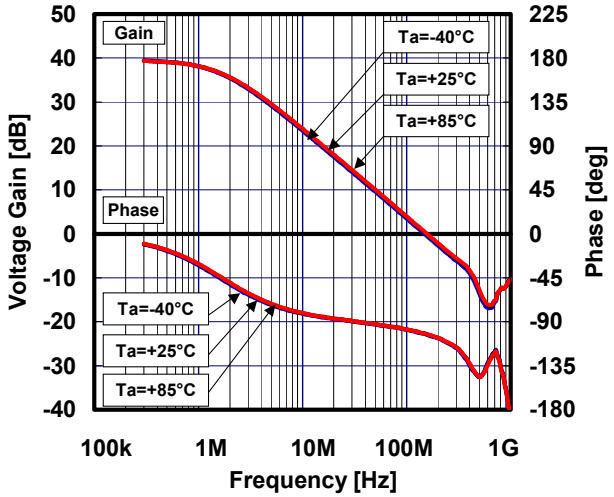
Voltage Gain vs. Frequency (with Cpacitive load)

V^+/V^-=±4.5V, V_{IN}=0.02V_{PP}, G_V=40dB, R_T=50Ω
R_F=1.98kΩ, R_G=20Ω, C_F=0pF, R_L=1kΩ, Ta=+25°C



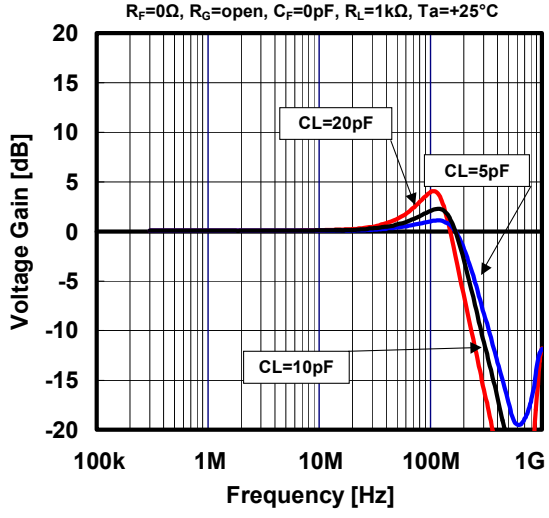
Voltage Gain vs. Frequency (correlation with Ta)

V^+/V^-=±2.5V, V_{IN}=0.02V_{PP}, G_V=40dB, R_T=50Ω
R_F=1.98kΩ, R_G=20Ω, C_F=0pF, R_L=2kΩ, C_L=5pF



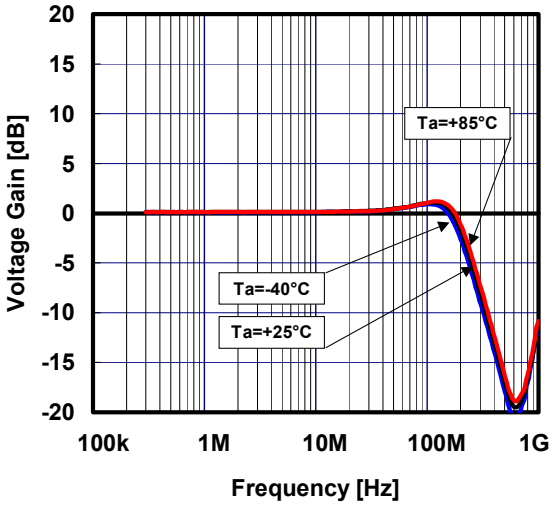
Voltage Gain vs. Frequency (with Cpacitive load)

V^+/V^-=±4.5V, V_{IN}=0.02V_{PP}, G_V=0dB, R_T=50Ω
R_F=0Ω, R_G=open, C_F=0pF, R_L=1kΩ, Ta=+25°C



Voltage Gain vs. Frequency (correlation with Ta)

V^+/V^-=±4.5V, V_{IN}=0.02V_{PP}, G_V=0dB, R_T=50Ω
R_F=0Ω, R_G=open, C_F=0pF, R_L=1kΩ, C_L=20pF



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