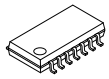
SINGLE SUPPLY QUAD OPERATIONAL AMPLIFIER

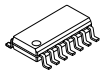
■ GENERAL DESCRIPTION

The NJM12902 is single-supply quad operational amplifier, which can operate from 2V supply. The features are low offset voltage, low bias current, and drive TTL or DTL circuit directly. The package lineup is DMP and others compact, so that the NJM12902 is suitable for audio for low voltage operation and any other kind of signal amplifier.

■ PACKAGE OUTLINE



NJM12902M



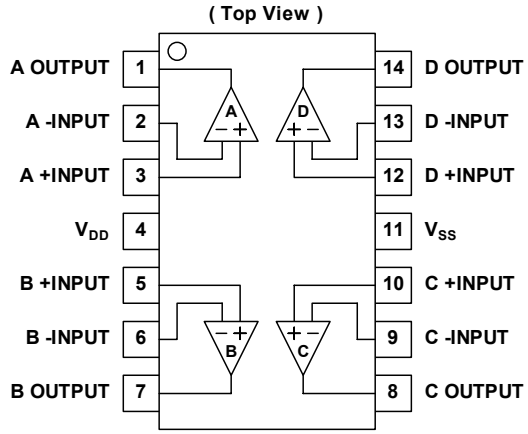
NJM12902E

NJM12902V

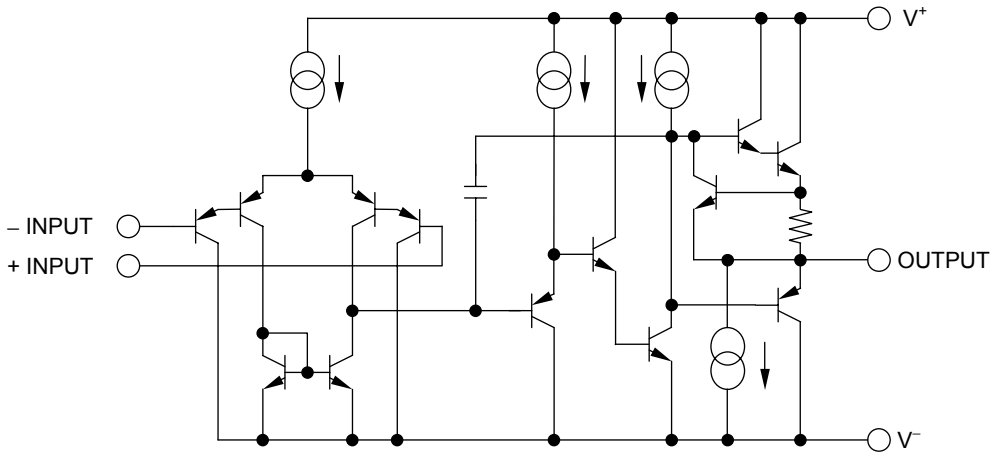
■ FEATURES

- Operating Voltage (+2V~+14V)
- Input Offset Voltage (5mV max.)
- Slew Rate (0.7V/μs typ.)
- Operating Current (1.0mA typ.)
- Bipolar Technology
- Package Outline NJM12902M DMP14
  NJM12902E EMP14
  NJM12902V SSOP14

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT (1/4 Shown)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25˚C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	15	V
Differential Input Voltage	V_{ID}	14	V
Input Voltage	V_{IC}	-0.3~+14	V
Power Dissipation	P_D	(DMP14) 300 (EMP14) 300 (SSOP14) 300	mW
Operating Temperature Range	T_{opr}	-40~+85	˚C
Storage Temperature Range	T_{stg}	-50~+125	˚C

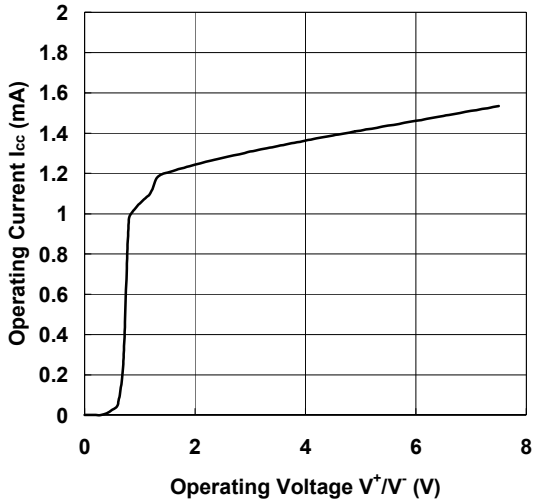
■ ELECTRICAL CHARACTERISTICS

(V^+=5V,Ta=25˚C)

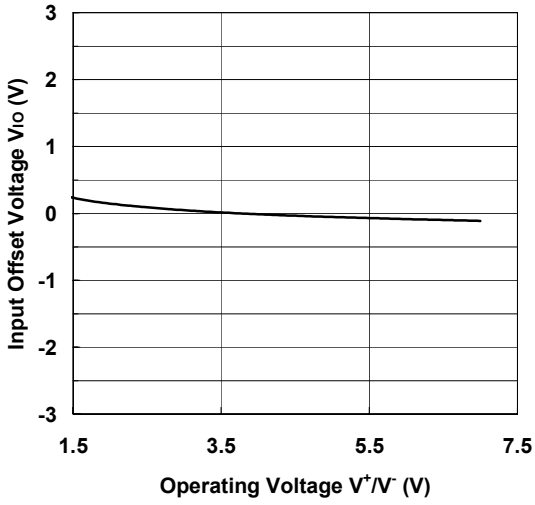
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V_{opr}		2	-	14	V
Input Offset Voltage	V_{IO}	R_S=0Ω	-	1	5	mV
Input Offset Current	I_{IO}		-	5	50	nA
Input Bias Current	I_B		-	20	150	nA
Large Signal Voltage Gain	A_V	R_L≥2kΩ	-	100	-	dB
Maximum Output Voltage Swing	V_{OM}	R_L=2kΩ	3.5	-	-	V
Input Common Mode Voltage Range	V_{ICM}		0~3.5	-	-	V
Common Mode Rejection Ratio	CMR		-	85	-	dB
Supply Voltage Rejection Ratio	SVR		-	100	-	dB
Output Source Current	I_{SOURCE}	V_{IN}^+=1V,V_{IN}^-=0V	20	40	-	mA
Output Sink Current	I_{SINK}	V_{IN}^+=0V,V_{IN}^-=1V	8	30	-	mA
Channel Separation	CS	f=1k~20kHz	-	120	-	dB
Operating Current	I_{CC}	R_L=∞	-	1.0	2.0	mA
Slew Rate	SR	V^+/V^-=±2.5V, R_L=2kΩ, A_V=0dB,f=1kHz	-	0.7	-	V/μs
Gain Bandwidth Product	GB		-	1.5	-	MHz

■ TYPICAL CHARACTERISTICS

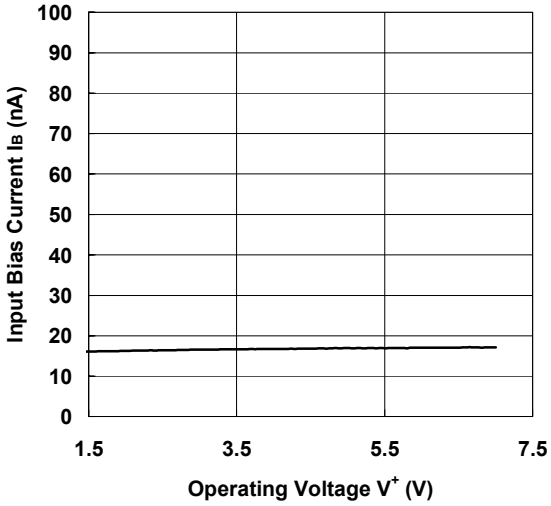
Operating Current vs. Operating Voltage
(Ta=25°C)



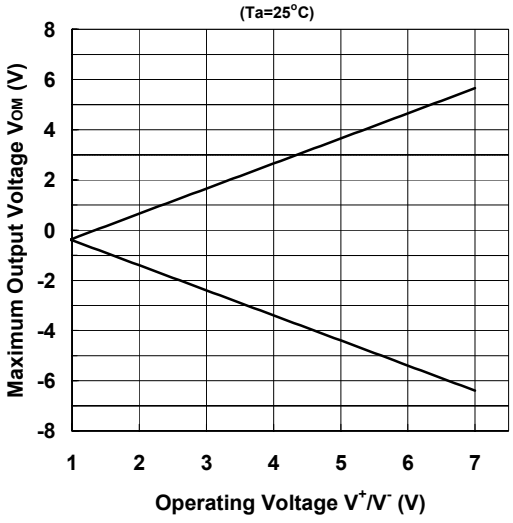
Input Offset Voltage vs. Operating Voltage
(Ta=25°C)



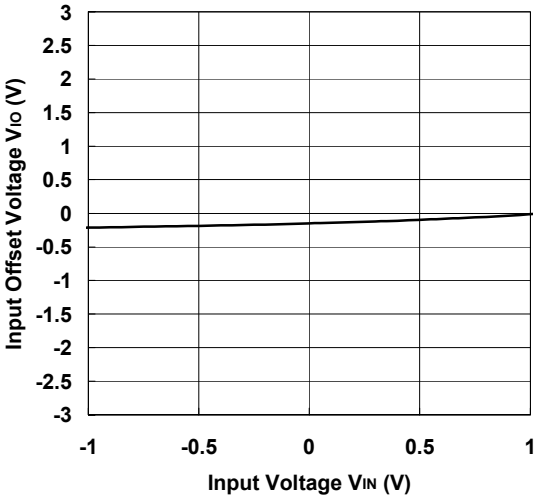
Iput Bias Current vs. Operating Voltage
(Ta=25°C)



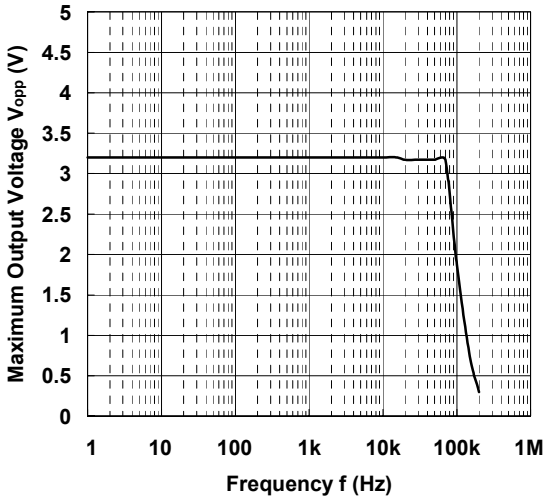
Maximum Output Voltage vs. Operating Voltage
(Ta=25°C)



Input offset Voltage vs. Input voltage
(V+=5V, Ta=25°C)

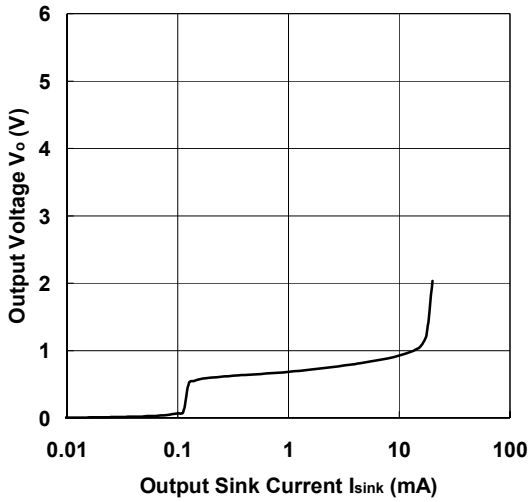


Maximum Output Voltage vs. Frequency
(Ta=25°C)

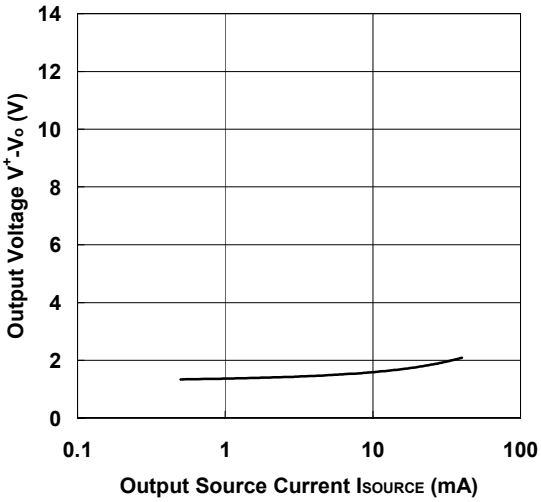


■ TYPICAL CHARACTERISTICS

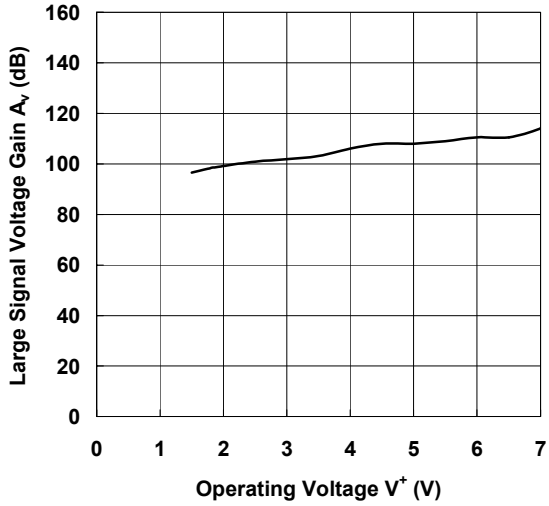
Output Voltage vs. Output Sink Current
(Ta=25°C)



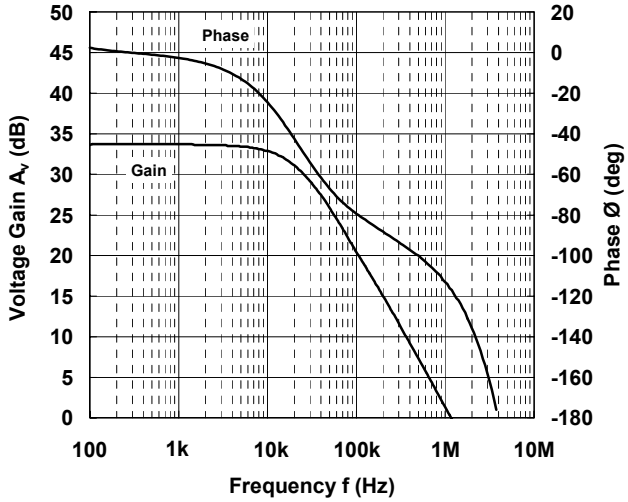
Output Voltage vs. Output Source Current
(Ta=25°C)



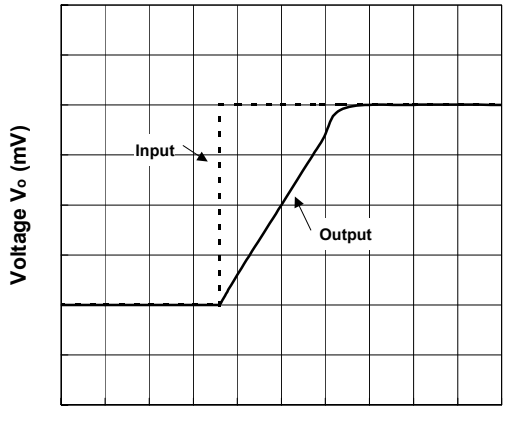
Voltage Gain vs. Operating Voltage
(R_L=2kΩ, Ta=25°C)



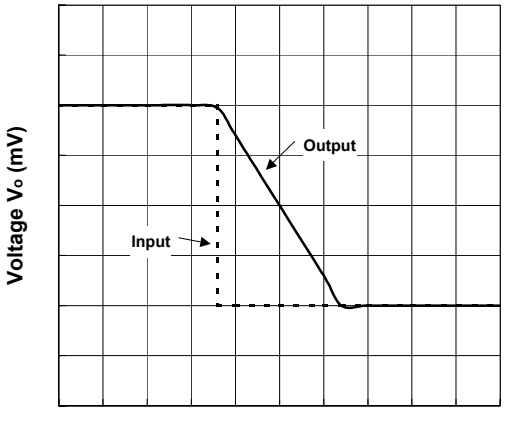
Voltage Gain / Phase vs. Frequency
(Ta=25°C)



Slew Rate (Rise)

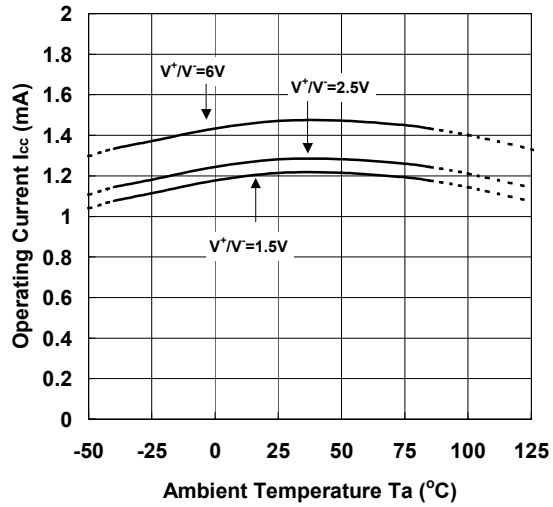


Slew Rate (Fall)

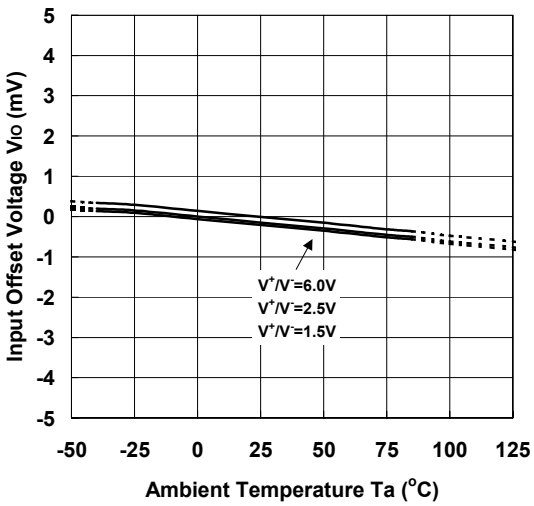


■ TYPICAL CHARACTERISTICS

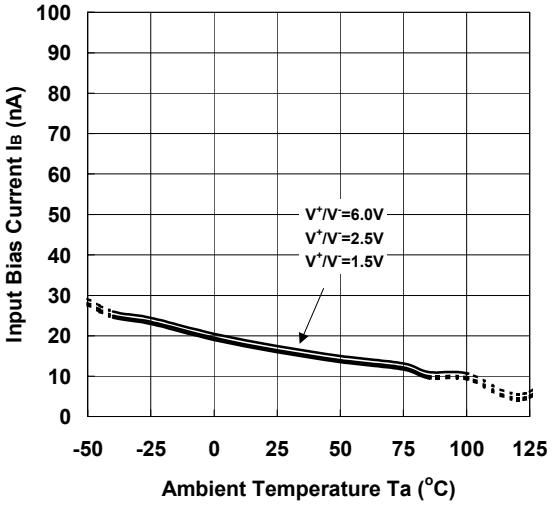
Operating Current vs. Ambient Temperature



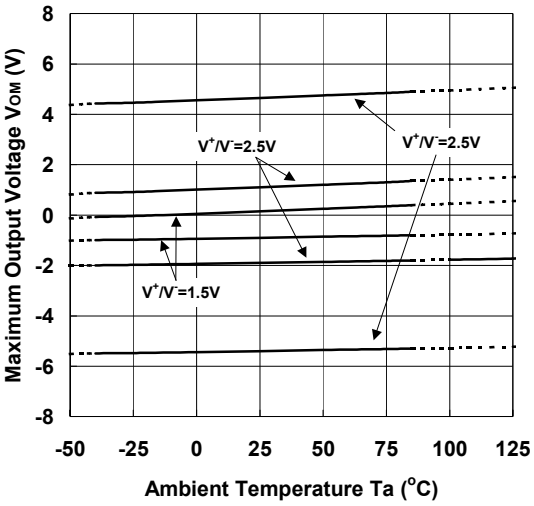
Input Offset Voltage
vs. Ambient Temperature



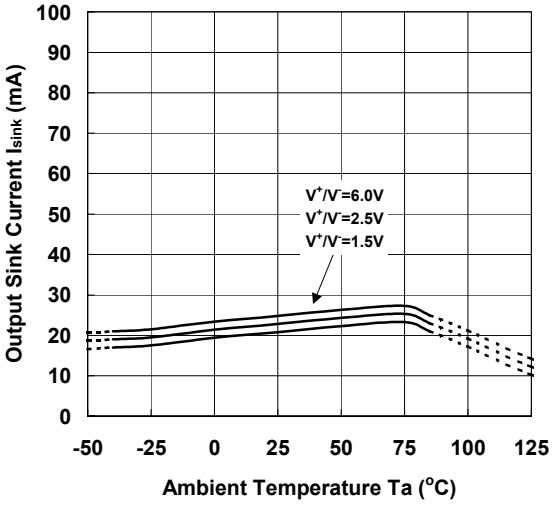
Input Bias Current vs. Ambient Temperature



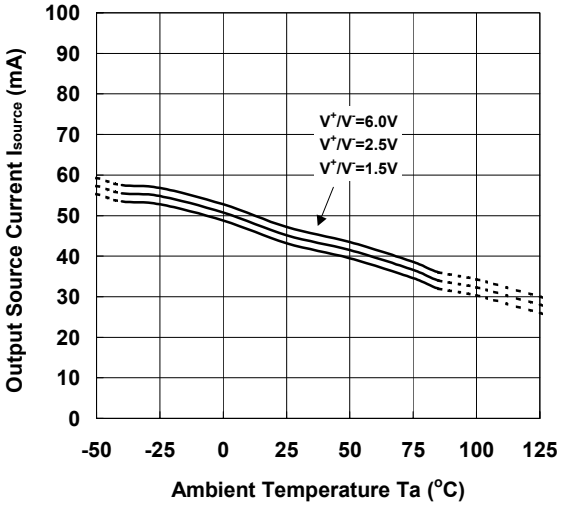
Maximum Output Voltage
v.s Temperature



Output Sink Current
vs. Ambient Temperature

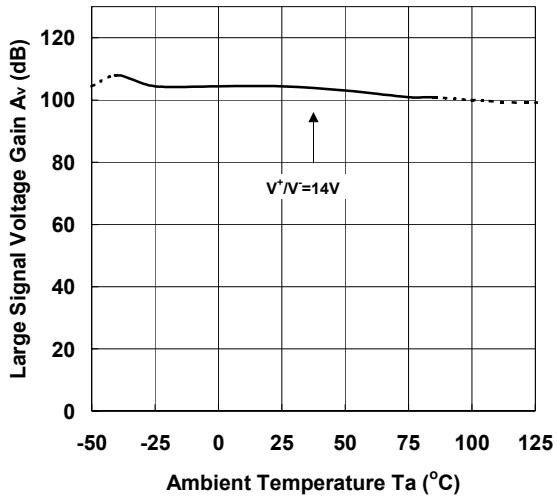


Output Source Current
vs. Ambient Temperature

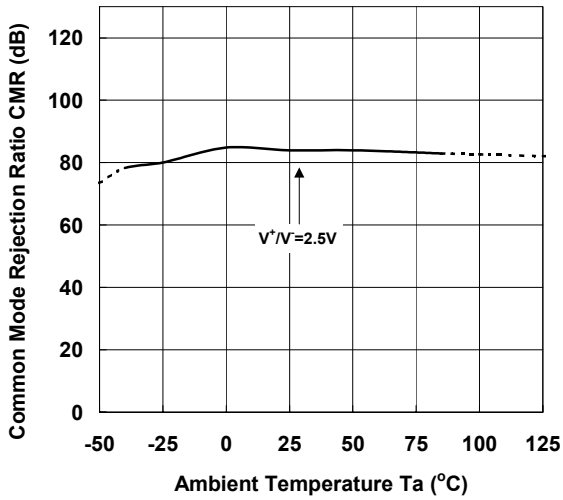


■ TYPICAL CHARACTERISTICS

Large Signal Voltage Gain vs. Ambient Temperature



Common Mode Rejection Ratio v.s Ambient Temperature



Supply Voltage Rejection Ratio v.s Ambient Temperature