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SINGLE SUPPLY QUAD OPERATIONAL AMPLIFIER

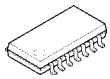
■ GENERAL DESCRIPTION

The NJM12902 is a single-supply quad amplifier which can operate from 2V supply.

It features low voltage operation, small offset voltage, small bias current and directly drives TTL and DTL circuit.

2.5mm square leadless package PCSP-14 and standard surface mount package are available for a wide application coverage.

■ PACKAGE OUTLINE



NJM12902M

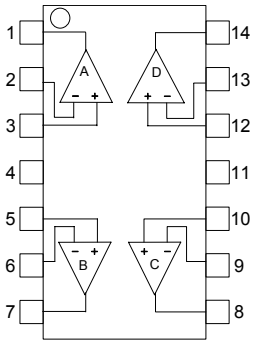
NJM12902V

NJM12902SC3

■ FEATURES

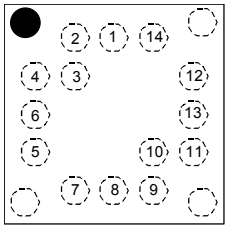
- Operating Voltage (+2V~+14V)
- Input Offset Voltage (5mV max.)
- Slew Rate (0.7V/μs typ.)
- Operating Current (1.0mA typ.)
- Bipolar Technology
- Package Outline DMP14, SSOP14,PCSP14-C3

■ PIN CONFIGURATION



NJM12902M, NJM12902V

PIN FUNCTION	
1.A OUTPUT	8.C OUTPUT
2.A –INPUT	9.C –INPUT
3.A +INPUT	10.C +INPUT
4.V^+	11. GND(V^-)
5.B +INPUT	12.D +INPUT
6.B –INPUT	13.D –INPUT
7.B OUTPUT	14.D OUTPUT

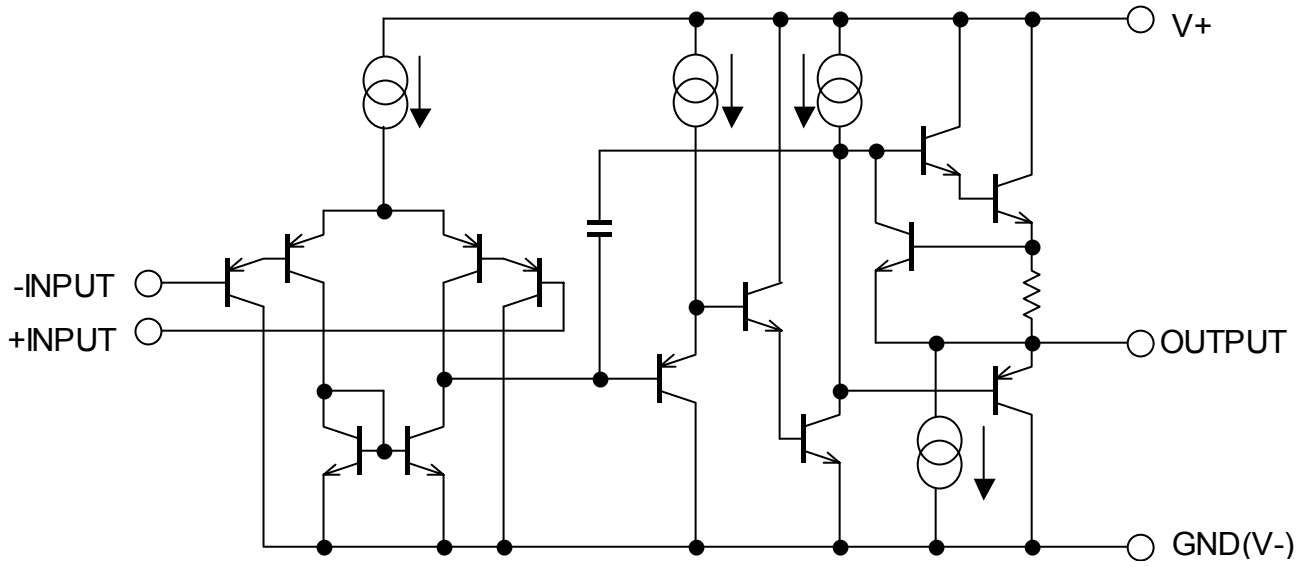


(TOP VIEW)

NJM12902SC3

PIN FUNCTION	
1.A OUTPUT	8.C OUTPUT
2.A –INPUT	9.C –INPUT
3.A +INPUT	10.C +INPUT
4.V^+	11. GND(V^-)
5.B +INPUT	12.D +INPUT
6.B –INPUT	13.D –INPUT
7.B OUTPUT	14.D OUTPUT

■ **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 (SSOP14) 300 (PCSP14-C3) 640 (Note1)	mW
Operating Temperature Range	T_{opr}	-40~+85	˚C
Storage Temperature Range	T_{stg}	-50~+125	˚C

(Note 1) On the PCB "EIA/JEDEC (114.3×76.2×1.6mm, 4 layers, FR-4)"

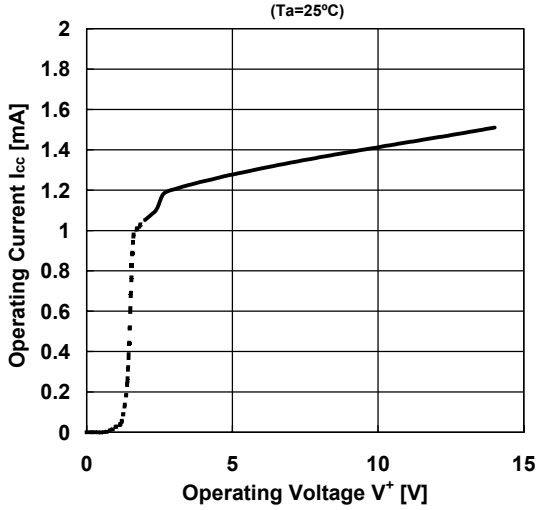
■ ELECTRICAL CHARACTERISTICS

(V^+=5V,Ta=25˚C)

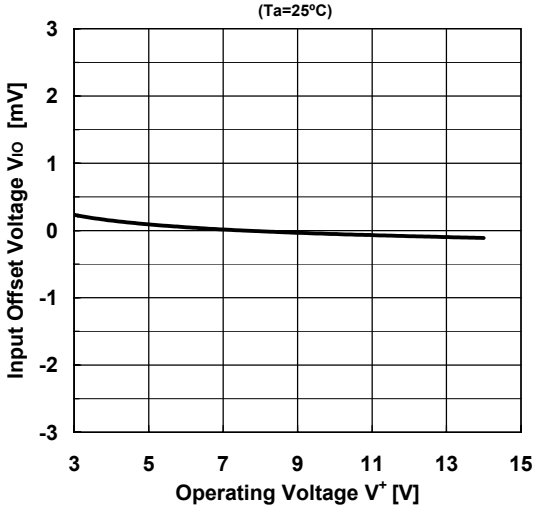
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V_{opr}		2	-	14	V
Input Offset Voltage	V_{IO}	R_S=0Ω	-	1	5	mV
Input Offset Current	I_{IO}		-	5	50	nA
Input Bias Current	I_B		-	20	150	nA
Large Signal Voltage Gain	A_V	R_L≥2kΩ	-	100	-	dB
Maximum Output Voltage Swing	V_{OPP}	R_L=2kΩ	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

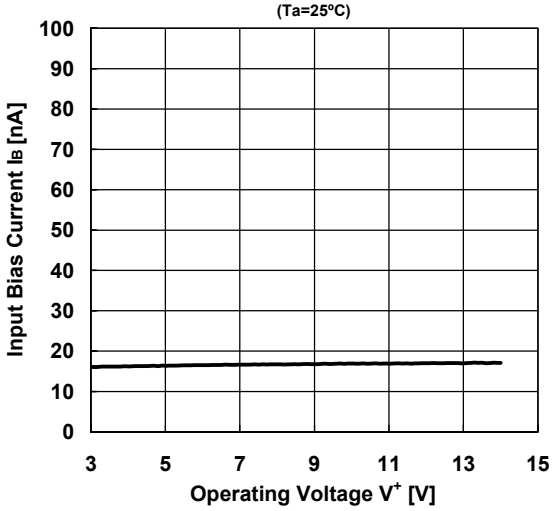
Operating Current vs. Operating Voltage
(Ta=25ºC)



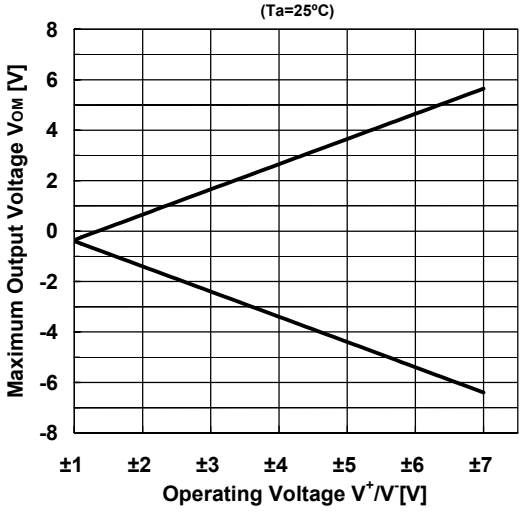
Input Offset Voltage vs. Operating Voltage
(Ta=25ºC)



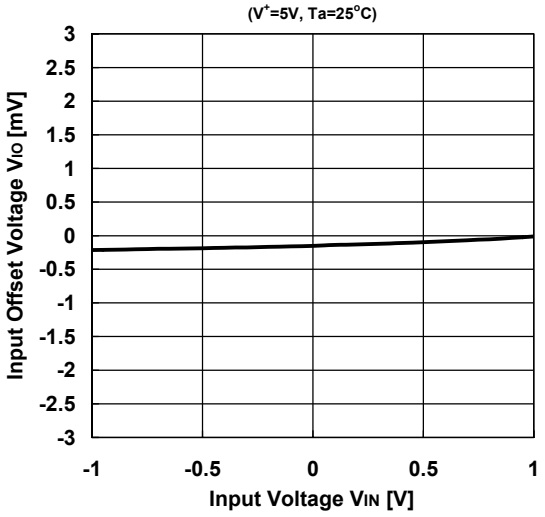
Input Bias Current vs. Operating Voltage
(Ta=25ºC)



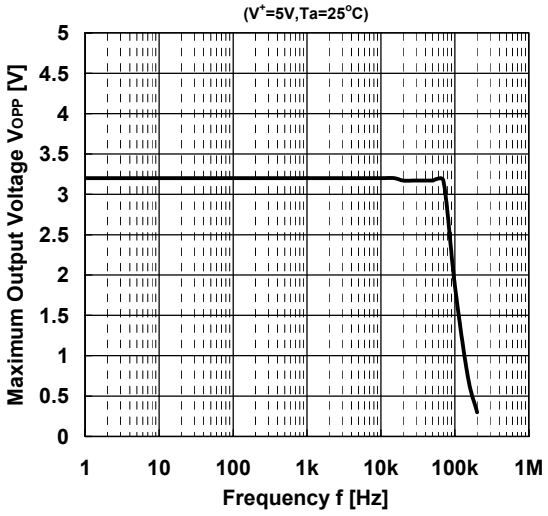
Maximum Output Voltage
vs. Operating Voltage
(Ta=25ºC)



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



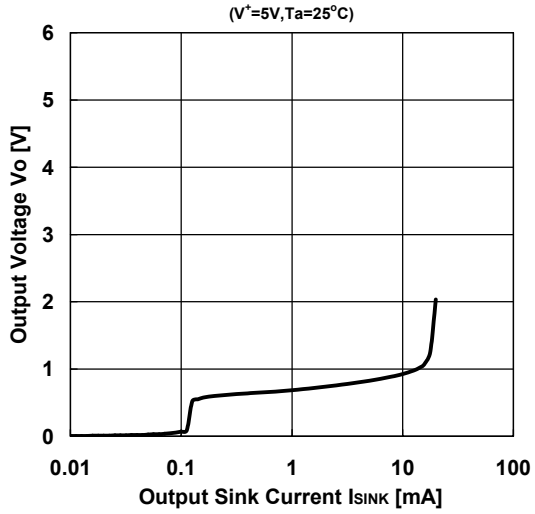
Maximum Output Voltage vs. Frequency
(V+=5V,Ta=25°C)



■ TYPICAL CHARACTERISTICS

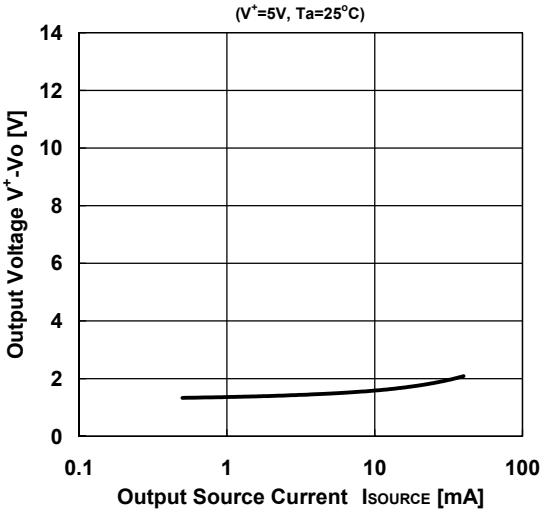
Output Voltage vs. Output Sink Current

(V^+=5V,Ta=25°C)



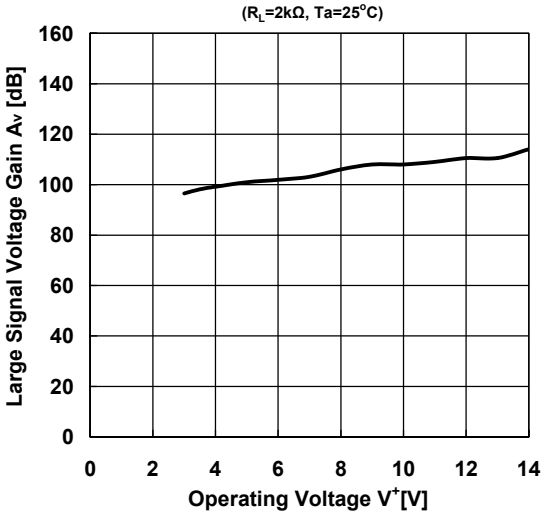
Output Voltage vs. Output Source Current

(V^+=5V, Ta=25°C)



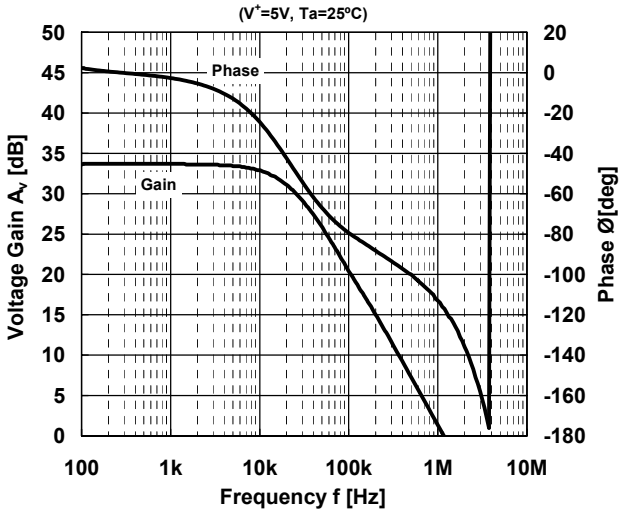
Voltage Gain vs. Operating Voltage

(R_L=2kΩ, Ta=25°C)



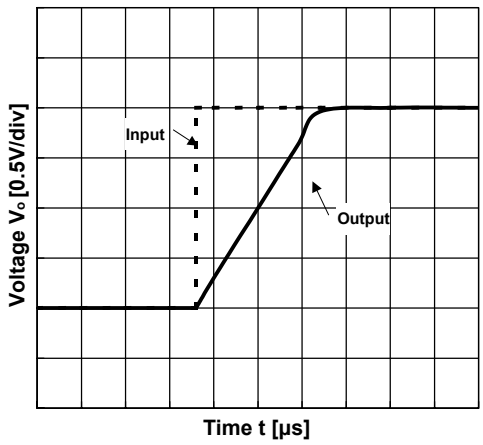
Voltage Gain / Phase vs. Frequency

(V^+=5V, Ta=25ºC)



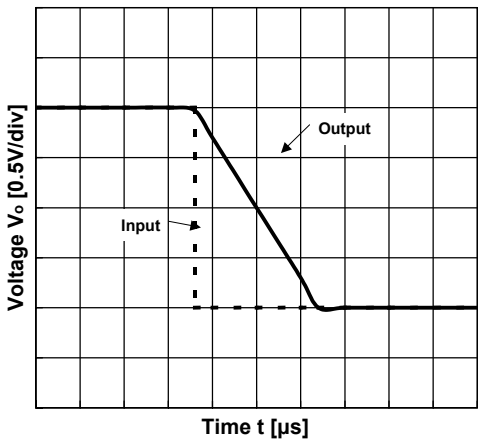
Slew Rate (Rise)

(V^+=5V, Ta=25ºC)



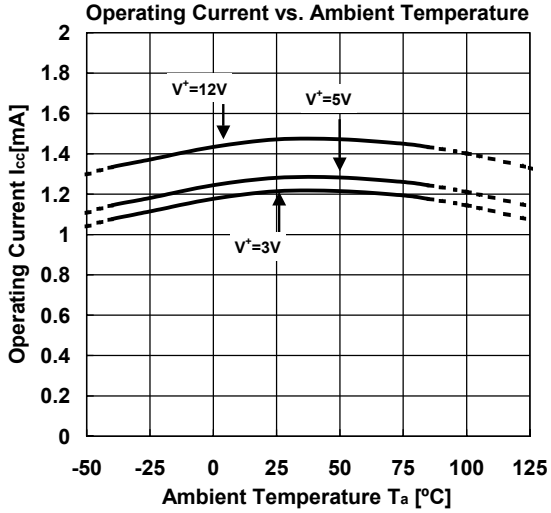
Slew Rate (Fall)

(V^+=5V, Ta=25ºC)

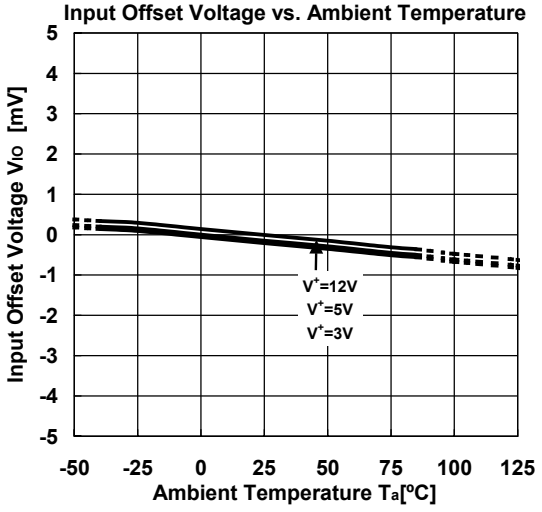


■ TYPICAL CHARACTERISTICS

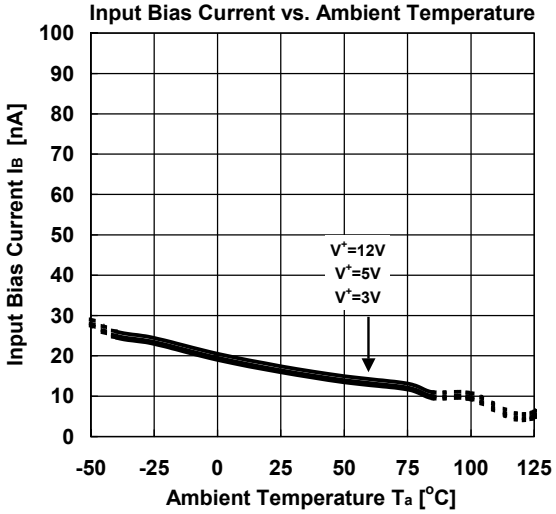
Operating Current vs. Ambient Temperature



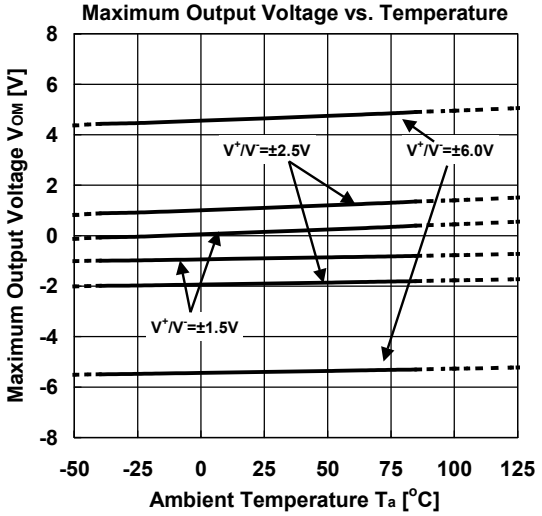
Input Offset Voltage vs. Ambient Temperature



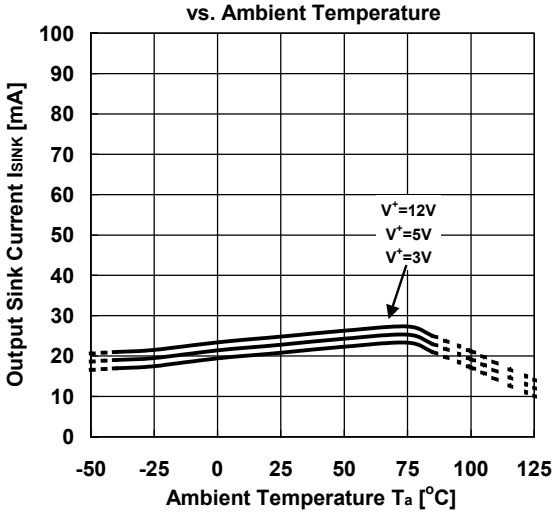
Input Bias Current vs. Ambient Temperature



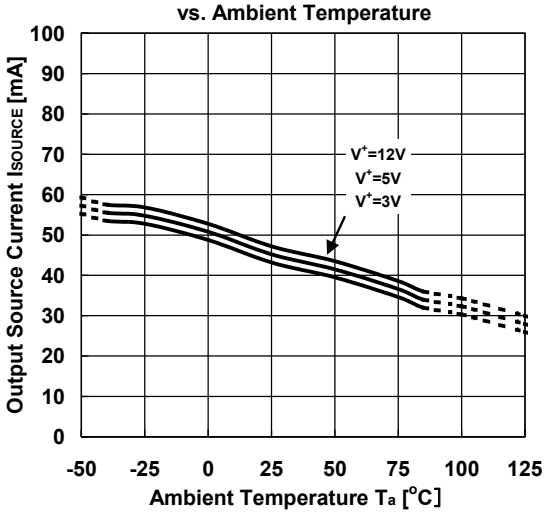
Maximum Output Voltage vs. Temperature



Output Sink Current vs. Ambient Temperature

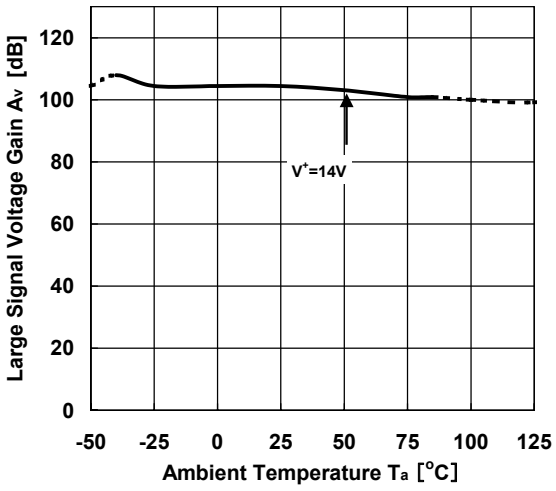


Output Source Current vs. Ambient Temperature

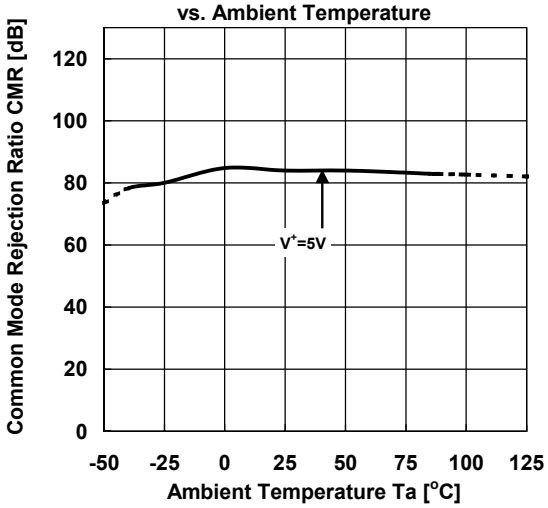


■ TYPICAL CHARACTERISTICS

Large Signal Voltage Gain vs. Ambient Temperature



Common Mode Rejection Ratio vs. Ambient Temperature



Supply Voltage Rejection Ratio vs.Ambient Temperature