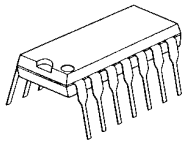
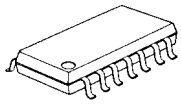
SINGLE SUPPLY QUAD AMPLIFIER

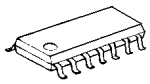
■ GENERAL DESCRIPTION

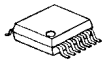
The NJM12902 is single-supply quad operational amplifier, which can operate from 2V supply. The features are low offset voltage, low bias current, and drive TTL or DTL circuit directly. The package lineup is DIP, DMP and others compact, which is SON, so that the **NJM12902** is suitable for audio for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

■ PACKAGE OUTLINE


NJM12902D1


NJM12902M

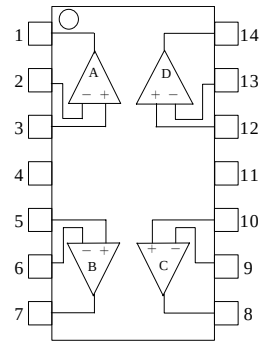

NJM12902E


NJM12902V

■ FEATURES

- Operating Voltage (+2V to +14V)
- Input Offset Voltage (5mV max.)
- Slew Rate (0.7V/μs typ.)
- Operating Current (1.0mA typ.)
- Bipolar Technology
- Package Outline DIP14,DMP14,EMP14,SSOP14

■ PIN CONFIGURATION

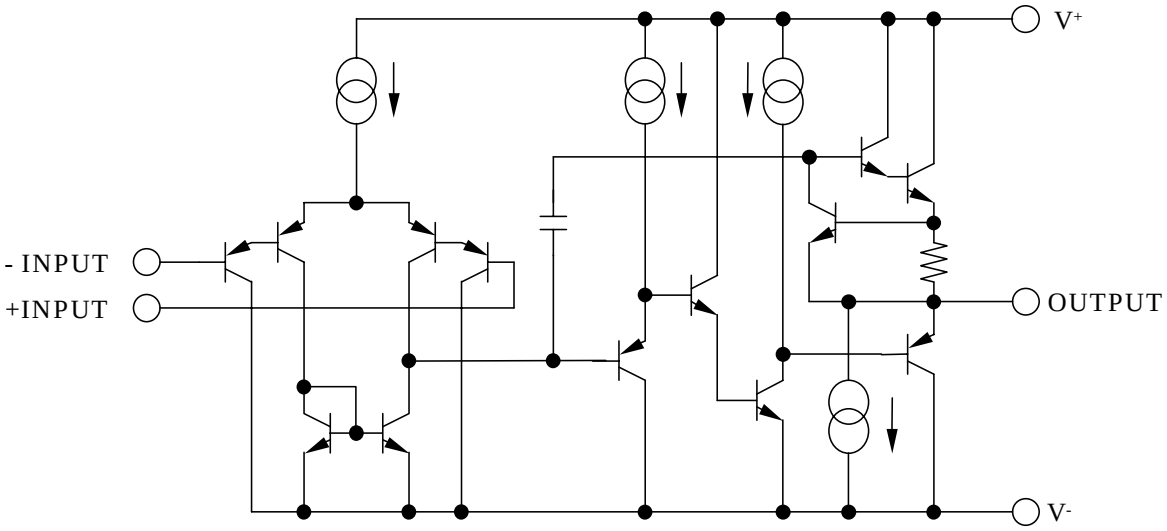


NJM12902D1/12902M
NJM12902E/12902V

PIN FUNCTION

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

■ EQUIVALENT CIRCUIT (1/4Shown)



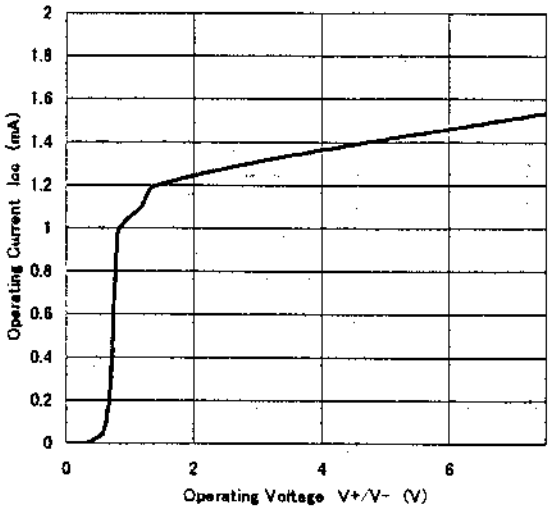
■ **ABSOLUTE MAXIMUM RATING** (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	15	V
Differential Input Voltage	V_{ID}	14	V
Input Voltage	V_{IC}	- 0.3 to +14	V
Power Dissipation	P_D	(DIP14) 700 (DMP14) 300 (EMP14) 300 (SSOP14) 300	mW
Operating Temperature Range	Topr	- 40 to +85	°C
Storage Temperature	Tstg	- 50 to +125	°C

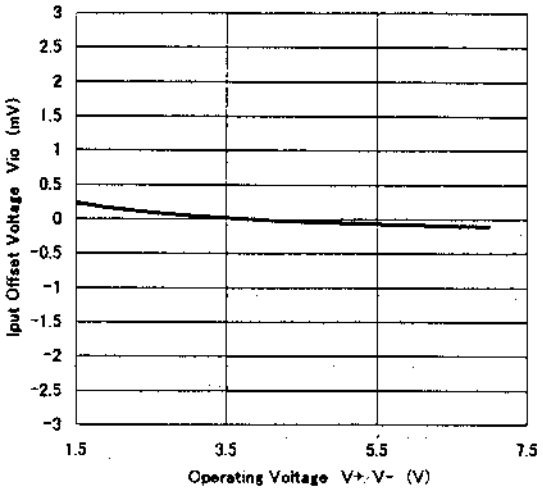
■ **ELECTRICAL CHARACTERISTICS** (V^+=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		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 to 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 to 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

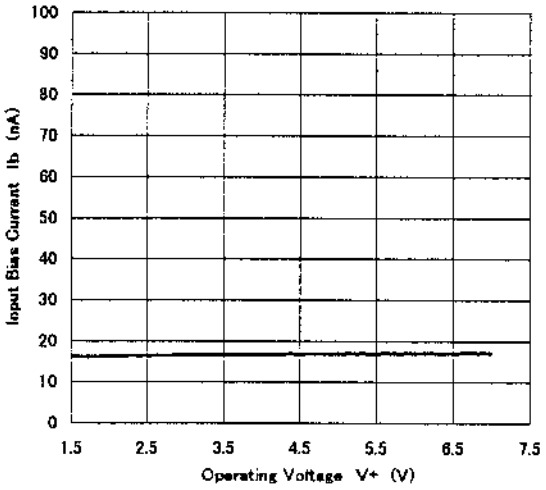
NJM12902 Operating Current vs. Operating Voltage



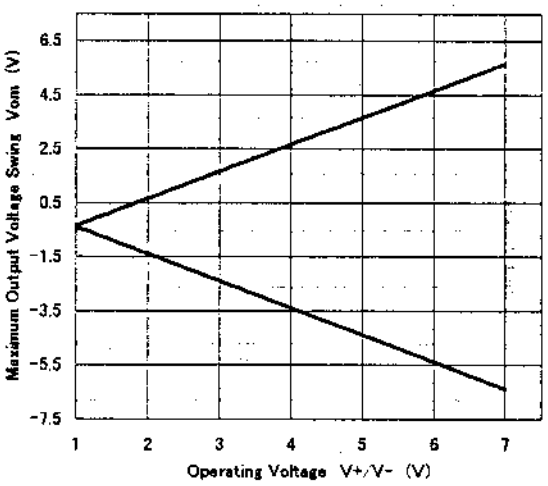
NJM12902 Input Offset Voltage vs. Operating Voltage



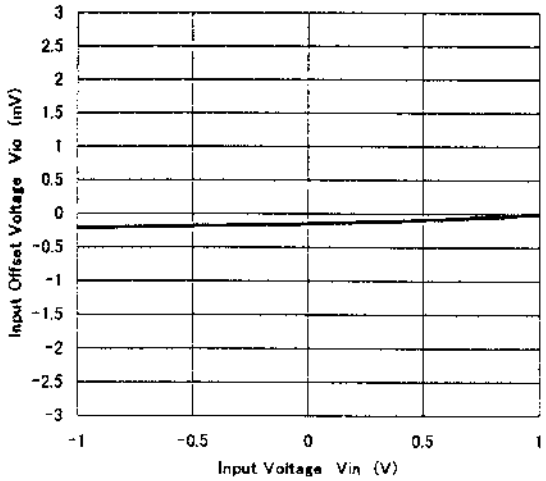
NJM12902 Input Bias Current vs. Operating Voltage



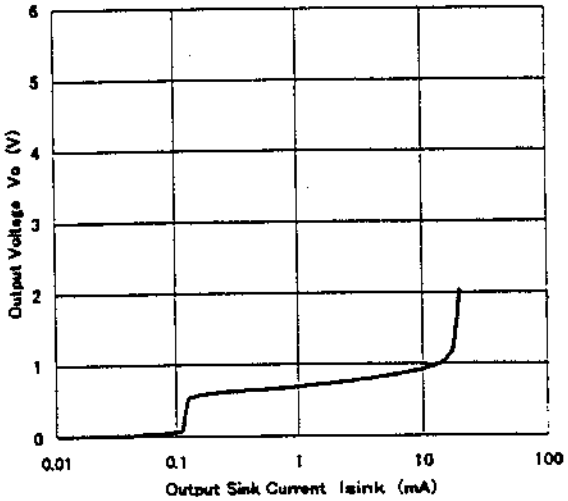
NJM12902 Maximum Output Voltage Swing vs. Operating Voltage



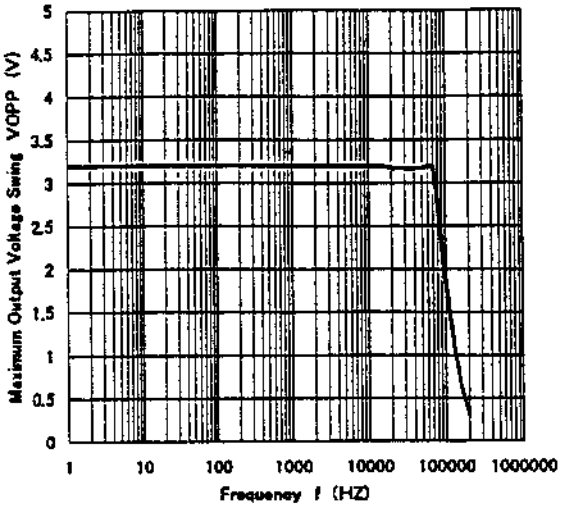
NJM12902 Input Common Mode Voltage Range



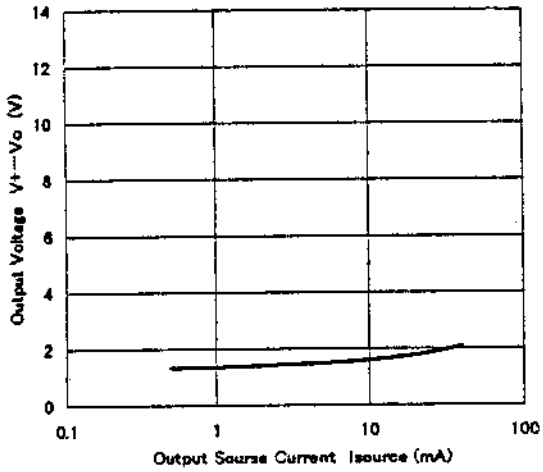
NJM12902 Output Voltage vs. Output Sink Current



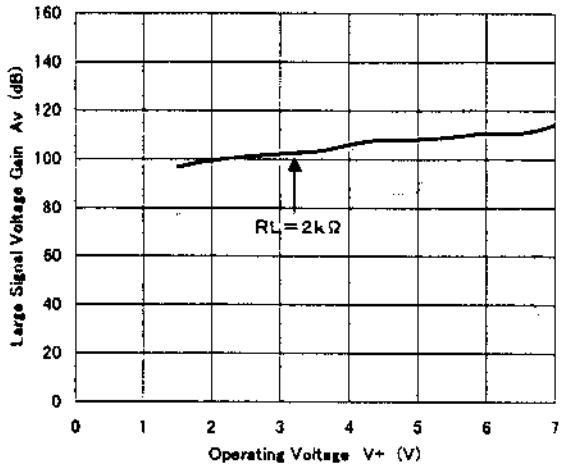
NJM12902 Maximum Output Voltage Swing vs. Frequency



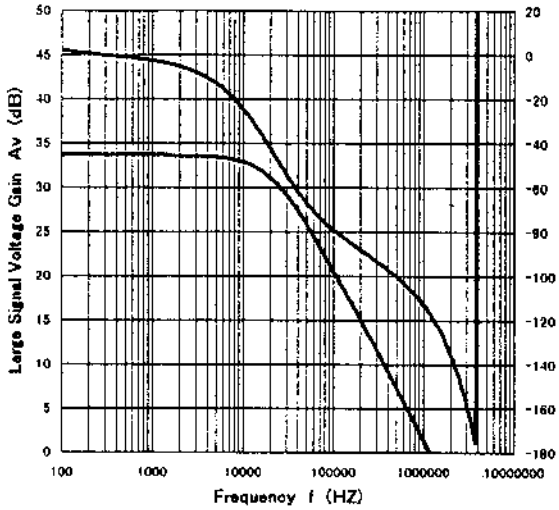
NJM12902 Output Voltage vs. Output Source Current



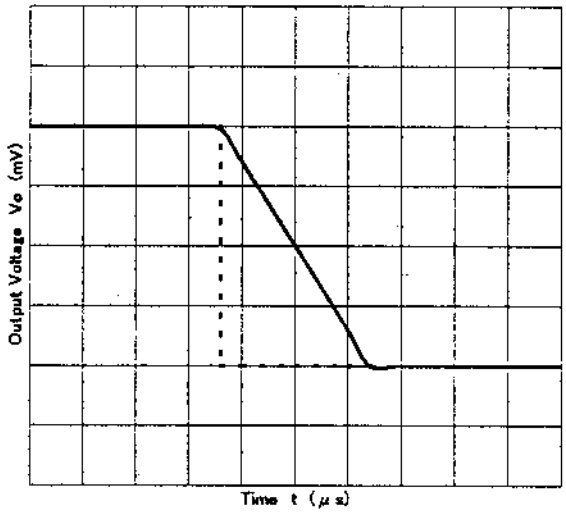
NJM12902 Large Signal Voltage Gain vs. Operating Voltage



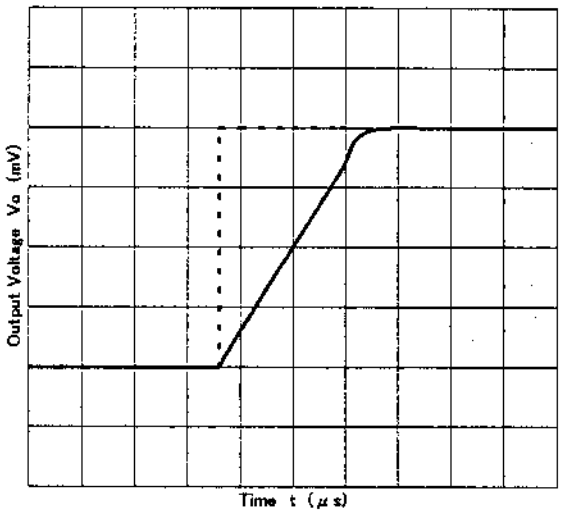
NJM12902 Large Signal Voltage Gain vs. Frequency



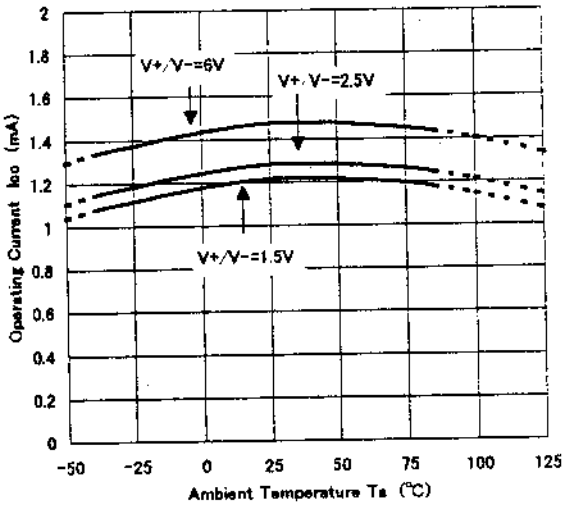
NJM12902 Slew Rate(fall)



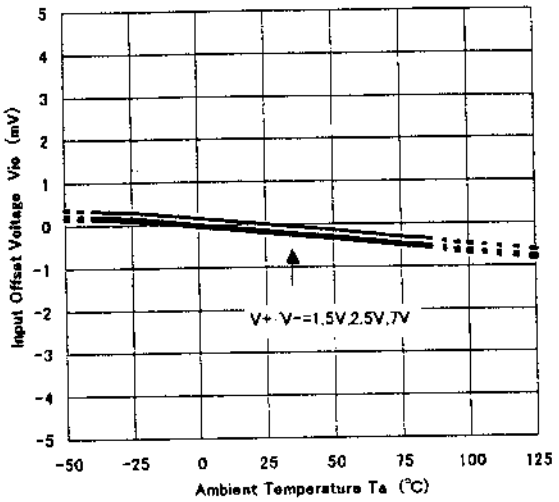
NJM12902 Slew Rate(Rise)



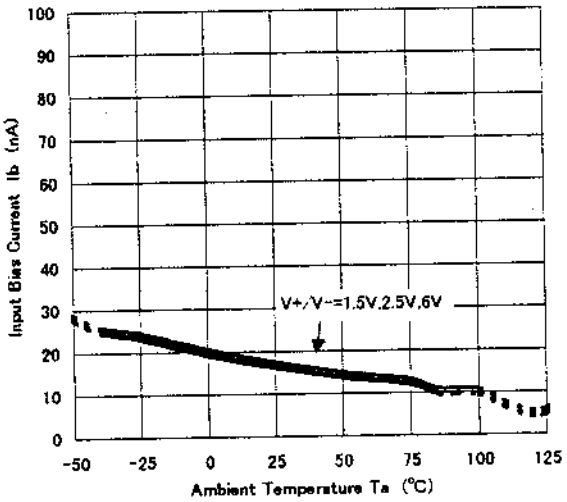
NJM12902 Operating Current vs. Temperature



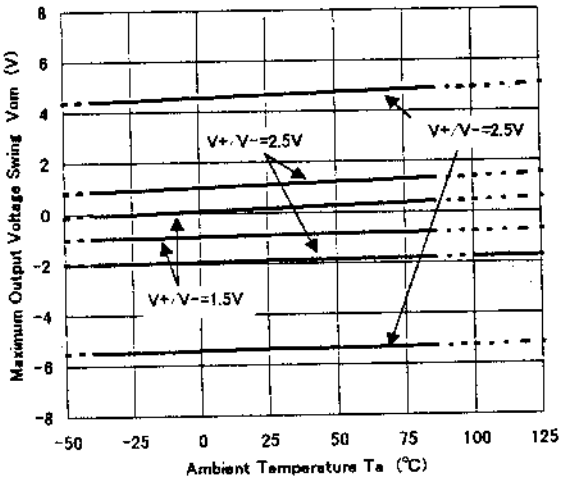
NJM12902 Input Offset Voltage vs. Temperature



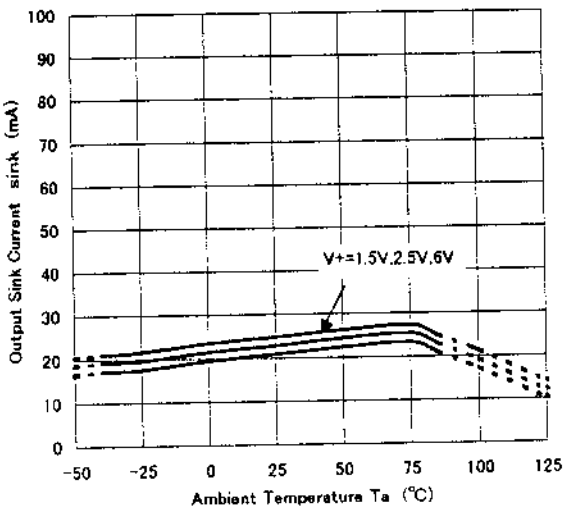
NJM12902 Input Bias Current vs. Temperature



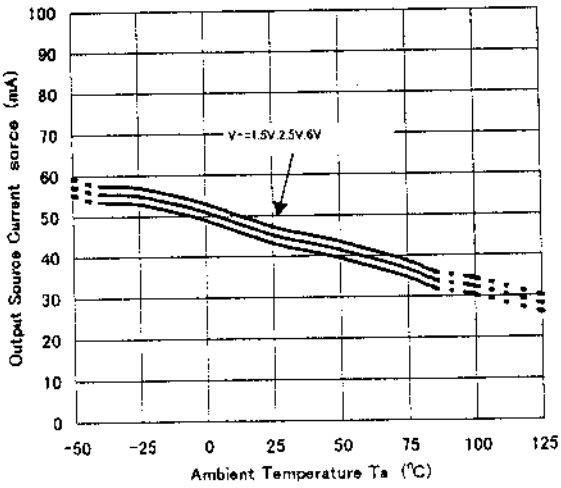
NJM12902 Maximum Output Voltage Swing vs. Temperature



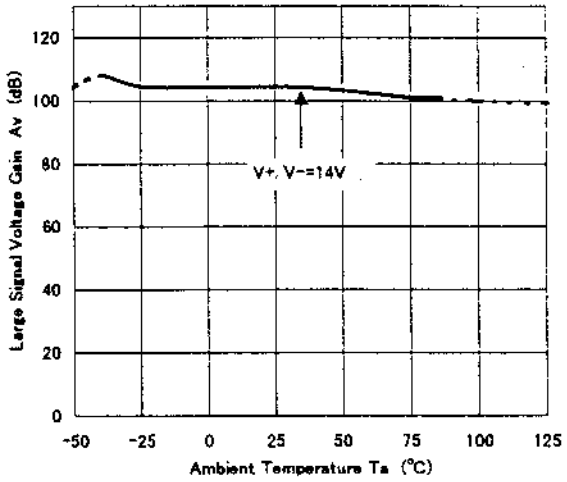
NJM12902 Output Sink Current vs. Temperature



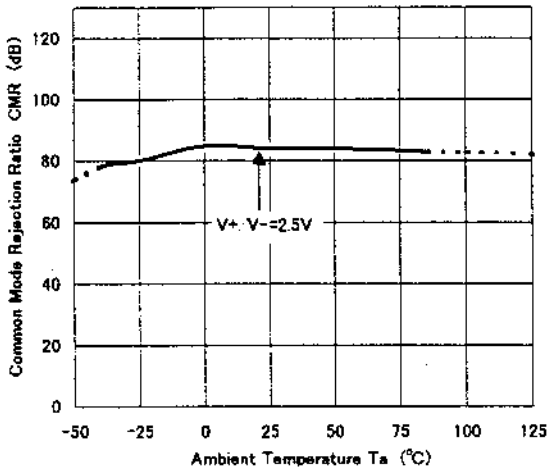
NJM12902 Output Source Current vs. Temperature



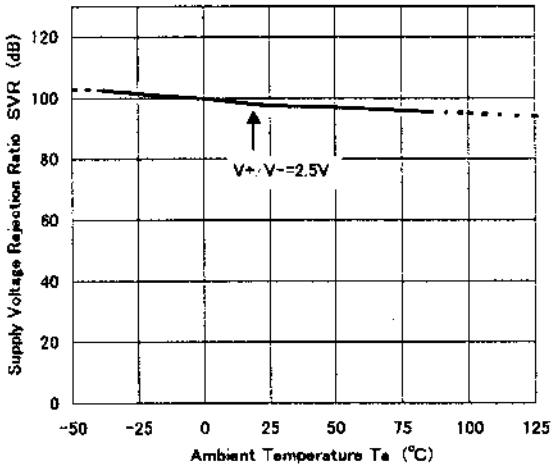
NJM12902 Large Signal Voltage Gain vs. Temperature



NJM12902 Common Mode Rejection Ratio vs. Temperature



NJM12902 Supply Voltage Rejection Ratio vs. Temperature



MEMO