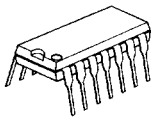
QUAD OPERATIONAL AMPLIFIER

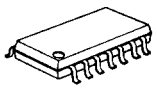
■ GENERAL DESCRIPTION

NJM 2112 is low operating voltage (±1.0 V min.) and low saturation output voltage (±2.0 V p-p at operating voltage ±25V) operational amplifier. It is applicable to HANDY TYPE CD, RADIO CASSETE CD, and PORTABLE DAT, that are digital audio apparatus which require the 5 V single supply operation and high output voltage. The NJM2112 is quad operational amplifier. Each amplifier of the NJM2112 has the same electrical characteristic of the NJM2115.

■ PACKAGE OUTLINE



NJM2112D



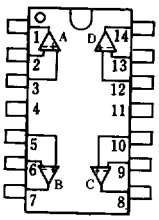
NJM2112M

NJM2112V

■ FEATURES

- Operating Voltage (±1.0V～±7.0V)
- Low Saturation Output Voltage ($\pm 2.0V_{p\text{-}p}$ @$V^+ = \pm 2.5V$)
- Package Outline DIP14, DMP14, SSOP14
- Bipolar Technology

■ PIN CONFIGURATION

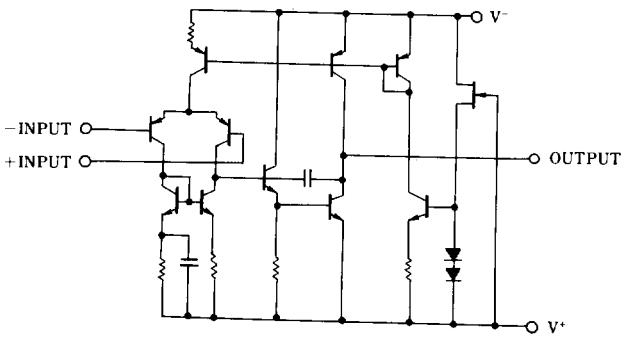


NJM2112D
NJM2112M
NJM2112V

PIN FUNCTION

1. A OUTPUT	8. C OUTPUT
2. A −INPUT	9. C −INPUT
3. A +INPUT	10. C +INPUT
4. V^+	11. 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℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±7.0	V
Differential Input Voltage	V_{ID}	±14	V
Power Dissipation	P_D	(DIP14) 500	mW
		(DIM14) 300	mW
		(SSOP14) 300	mW
Operating Temperature Range	T_{opr}	−20~+75	℃
Storage Temperature Range	T_{stg}	−40~+125	℃

■ ELECTRICAL CHARACTERISTICS

(V^+/V^-=±2.5V, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_S \leqq 10k\Omega$	—	1	6	mV
Input Bias Current	I_B		—	100	300	nA
Large Signal Voltage Gain	A_V	$R_L \geqq 10k\Omega$	60	80	—	dB
Maximum Output Voltage Swing	V_{OM}	$R_L \geqq 2.5k\Omega$	±2	±2.2	—	V
Input Common Mode Voltage Range	V_{ICM}		±1.5	—	—	V
Common Mode Rejection Ratio	CMR		60	74	—	dB
Supply Voltage Rejection Ratio	SVR		60	80	—	dB
Operating Current	I_{CC}	V_{IN}=O, R_L =∞	—	8	11	mA
Slew Rate	SR	A_U=1, V_{IN}=±1V	—	3.2	—	V/μs
Gain-Bandwidth product	GB	f=10kHz	—	9	—	MHz

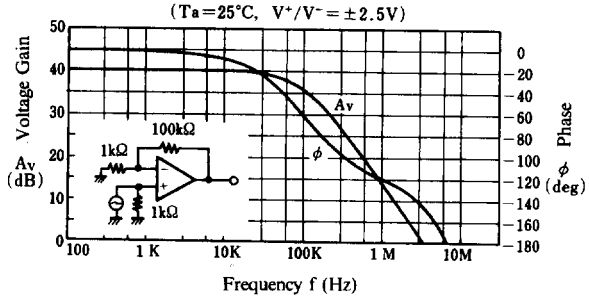
(note 1)Applied circuit voltage gain is desired to be operated within the range of 3 dB to 30 dB.

(note 2)Special care being required for input common mode voltage range and the oscillation due to the capacitive load when operating follower.

■ TYPICAL CHARACTERISTICS

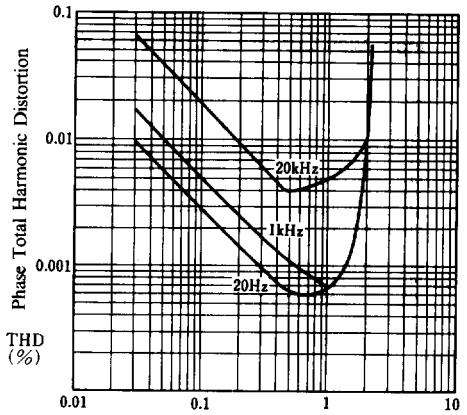
Voltage Gain, Phase vs. Frequency

(Ta=25°C, V⁺/V⁻=±2.5V)



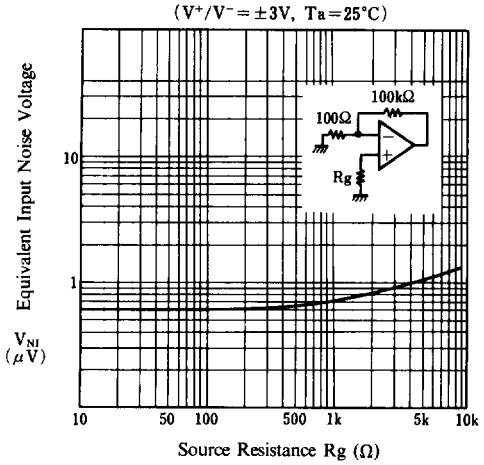
Total Harmonic Distartion vs. Output Voltage

(V⁺/V⁻=±3V, RL=2.4kΩ, Av=10dB, Ta=25°C)



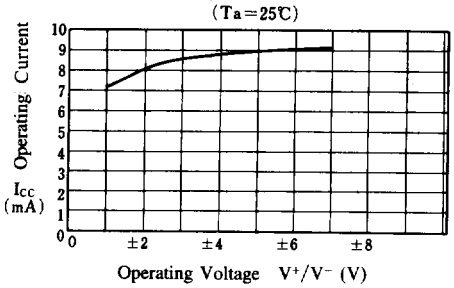
Equivalent Input Noise Voltage vs. Source Resistance

(V⁺/V⁻=±3V, Ta=25°C)



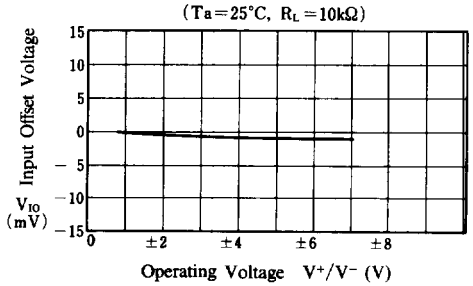
Operating Current vs. Operating Voltage

(Ta=25℃)



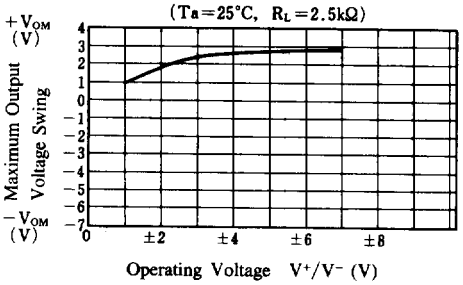
Input Offset Voltage vs. Operating Voltage

(Ta=25°C, RL=10kΩ)



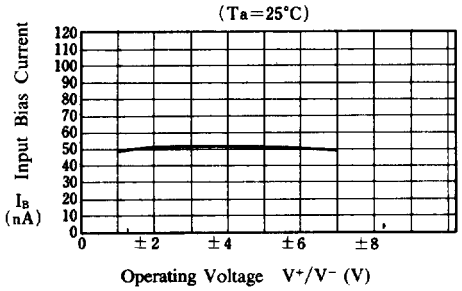
Maximum Output Voltage Swing vs. Operating Voltage

(Ta=25°C, RL=2.5kΩ)

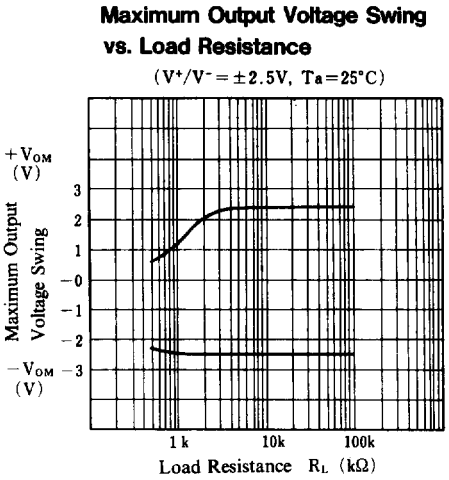


■ TYPICAL CHARACTERISTICS

Input Bias Curent vs. Operating Voltage

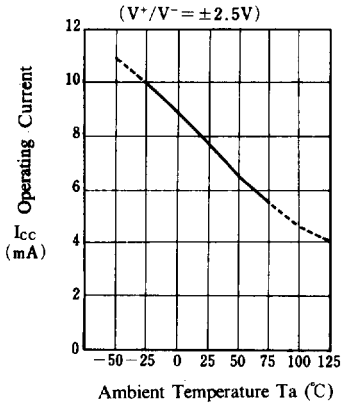


Maximum Output Voltage Swing vs. Load Resistance

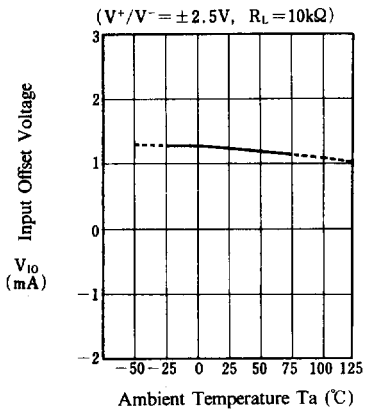


4

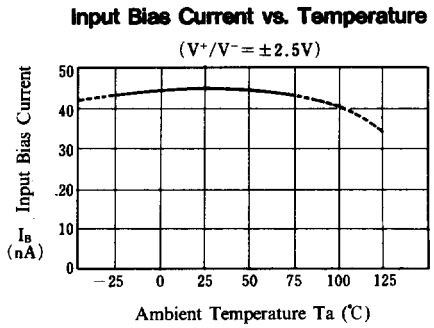
Operating Current vs. Temperature



Input Offset Voltage vs. Temperature



Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Temperature