

HIGH PERFORMANCE LOW-NOISE DUAL OPERATIONAL AMPLIFIER

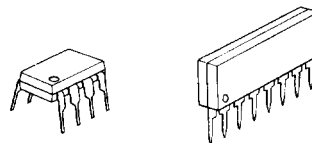
■ GENERAL DESCRIPTION

NJM 2114 is a high performance dual low noise operational amplifier which could be replaced in application with NJM5532. Comparing to NJM5532, it has superior specifications on Slew Rate, Bandwidth and Offset Voltage. Furthermore lower noise and distortion are achieved, it is applicable for Hi-Fi audio equipments.

■ FEATURES

- Operating Voltage ($\pm 3.0\text{V} \sim \pm 22.0\text{V}$)
- High Slew Rate ($15\text{V}/\mu\text{s}$ typ.)
- Wide Unity Gain Bandwidth (15MHz typ.)
- Low Noise Voltage ($0.9 \mu\text{Vrms}$ typ.)
- High Output Current (60mA typ.)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

■ PACKAGE OUTLINE



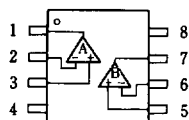
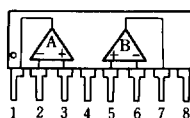
NJM2114D

NJM2114L



NJM2114M

■ PIN CONFIGURATION

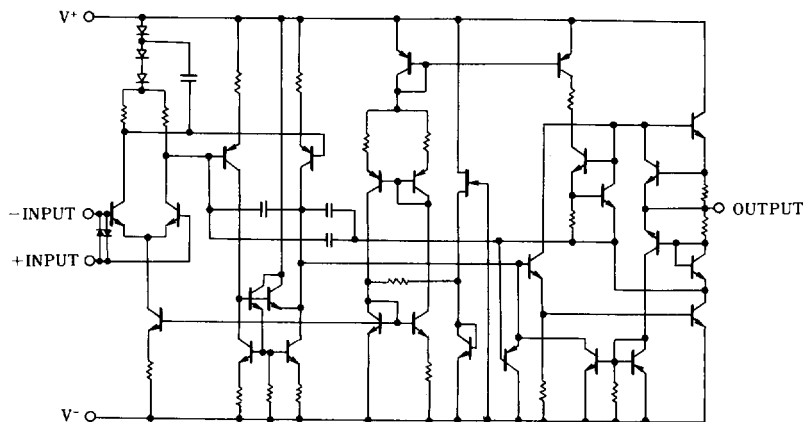
NJM2114D
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NJM2114L

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

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■ EQUIVALENT CIRCUIT





■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺ /V ⁻	±22	V
Input Voltage	V _I	V ⁺ /V ⁻	V
Differential Input Voltage	V _{ID}	±0.5	V
Power Dissipation	P _D	(DIP8) 800	mW
		(SIP8) 800	mW
		(DMP8) 600(note)	mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

(note 2) At on PC board

■ ELECTRICAL CHARACTERISTICS

(V⁺/V⁻=±15V, Ta=25°C)

Direct Current Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}		—	9	16	mA
Input Offset Voltage	V _{IO}		—	0.2	3	mV
Input Offset Current	I _{IO}		—	0.01	0.3	μA
Input Bias Current	I _B		—	0.5	1.8	μA
Maximum Peak To Peak Output Voltage Swing	V _{OM}		±12,	±13	—	V
Common Mode Rejection Ratio	CMR	V _{ICM} =12V	70	100	—	dB
Supply Voltage Rejection Ratio	SVR	V ⁺ /V ⁻ =±22 → ±11V	80	100	—	dB
Large Swing Voltage Gain .1	A _{V1}	R _L ≥2K, V _O =±10V	88	110	—	dB
Large Swing Voltage Gain .2	A _{V2}	R _L ≥600, V _O =±10V	83	104	—	dB
Maximum Output Voltage Swing .1	V _{OH1}	R _L ≥600	±12	14/-13	—	V
Maximum Output Voltage Swing .2	V _{OH2}	R _L ≥600, V ⁺ /V ⁻ =±18V	±15	17/-16	—	V
Input Resistance	R _{IN}		—	100	—	KΩ
Maximum Output Current Swing	I _{OH}		—	60	—	mA

■ ELECTRICAL CHARACTERISTICS

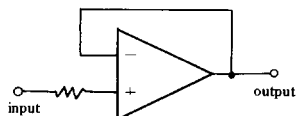
Alternating Current Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	G _V =20dB, R _L =2K	—	15	—	V/μS
Gain-bandwidth product	GB		—	13	—	MHz
Equivalent input noise voltage	V _{NI}	20Hz~20kHz	—	0.9	—	uVrms
Equivalent input noise voltage	V _{NI}	f _o =30Hz	—	5.5	—	nV/√Hz
Equivalent input noise voltage	V _{NI}	f _o =1kHz	—	3.3	—	nV/√Hz
Equivalent input noise current	I _{NI}	f _o =30Hz	—	1.5	—	pA/√Hz
Equivalent input noise current	I _{NI}	f _o =1kHz	—	0.4	—	pA/√Hz
Total harmonic distortion	THD	f=1kHz, V _O =5V	—	0.0005	—	%

■ NOTE

In the application as a voltage follower, there might be the case the inputs are damaged especially the moment the supply voltage is switched on.

That's why we recommend you to put the current limiting resistor at the input pin.

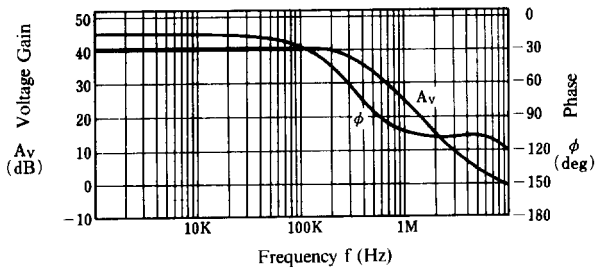




TYPICAL CHARACTERISTICS

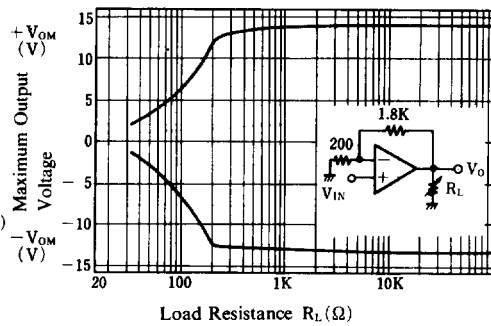
Voltage Gain, Phase vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 2K\Omega$, 40dBamp, $T_a = 25^\circ C$)



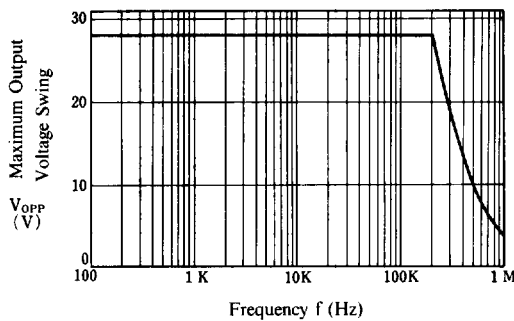
Maximum Output Voltage vs. Load Resistance

($V^+/V^- = \pm 15V$, $T_a = 25^\circ C$)



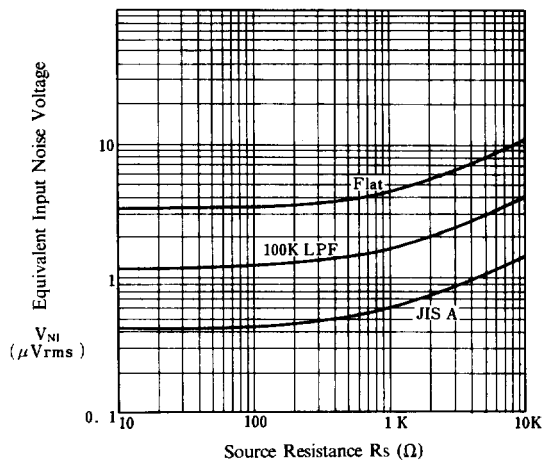
Maximum Output Voltage Swing vs. Frequency

($V^+/V^- = \pm 15V$, $T_a = 25^\circ C$)



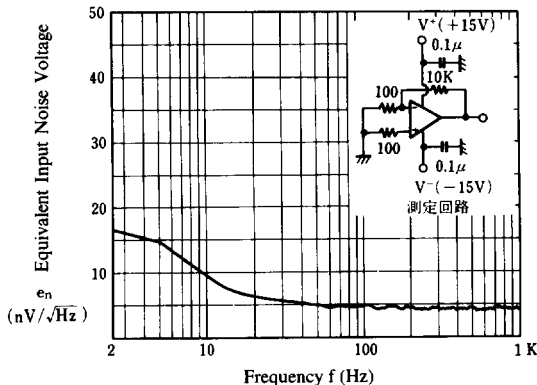
Equivalent Input Noise Voltage vs. Source Resistance

($V^+/V^- = \pm 15V$, $T_a = 25^\circ C$)



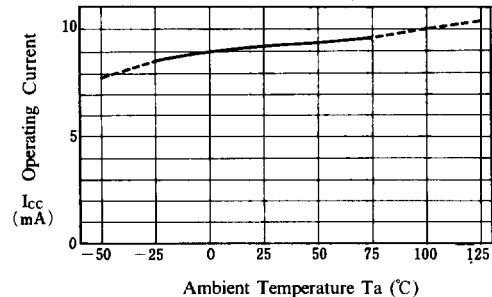
Equivalent Input Noise Voltage vs. Frequency

($V^+/V^- = \pm 15V$, $A_v = 40dB$)



Operating Current vs. Temperature

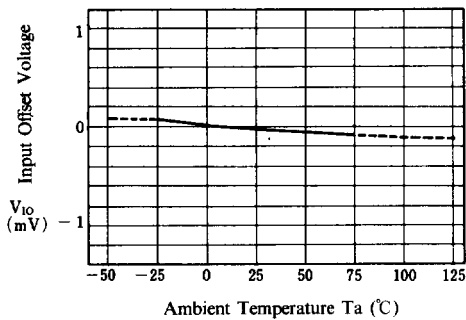
($V^+/V^- = \pm 15V$)



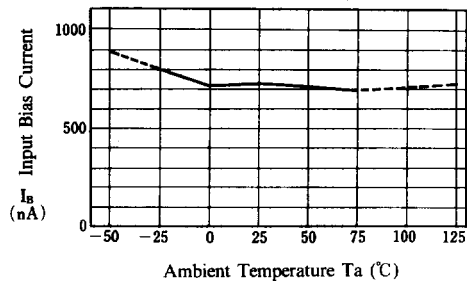


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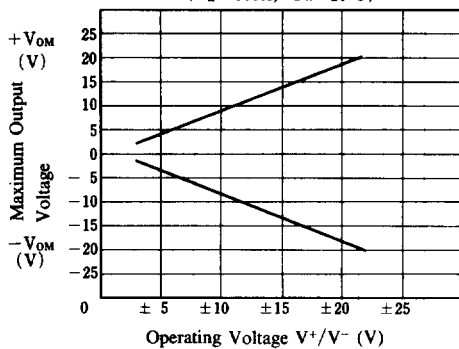
Input Offset Voltage vs. Temperature
($V^+/V^- = \pm 15V$)



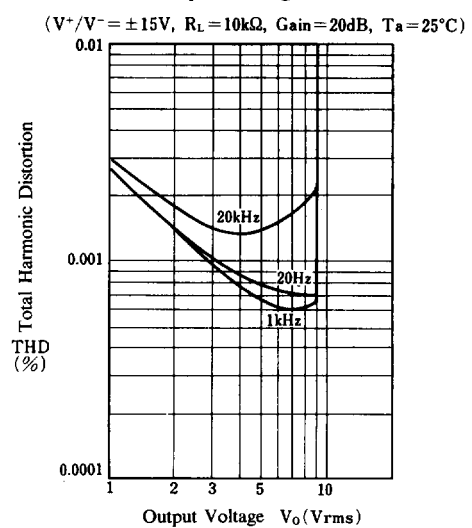
Input Bias Current vs. Temperature
($V^+/V^- = \pm 15V$)



Maximum Output Voltage vs. Operating Voltage
($R_L = 600\Omega$, $T_a = 25^\circ C$)



Total Harmonic distortion vs. Output Voltage
($V^+/V^- = \pm 15V$, $R_L = 10k\Omega$, Gain = 20dB, $T_a = 25^\circ C$)



Operating Current vs. Operating Voltage
($T_a = 25^\circ C$)

