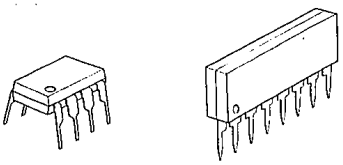
HIGH PERFORMANCE LOW-NOISE DUAL OPERATIONAL AMPLIFIER

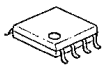
■ GENERAL DESCRIPTION

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.

■ PACKAGE OUTLINE



NJM2114D NJM2114L

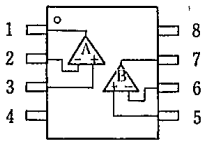


NJM2114M

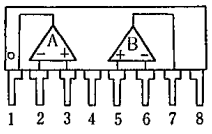
■ FEATURES

- Operating Voltage (±3.0V～±22.0V)
- High Slew Rate (15V/ μs typ.)
- Wide Unity Gain Bandwidth (15MHz typ.)
- Low Noise Voltage (0.9 μVnms typ.)
- High Output Current (60mA typ.)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

■ PIN CONFIGURATION



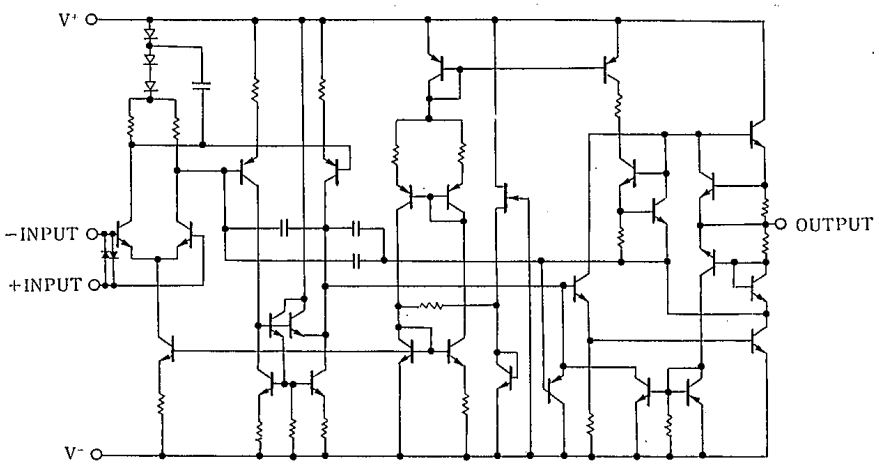
NJM2114D
NJM2114M



NJM2114L

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

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±22	V
Input Voltage	V_{IC}	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	℃
Storage Temperature Range	T_{stg}	−40～+125	℃

(note 2) At on PC board

■ ELECTRICAL CHARACTERISTICS

($V^+/V^-=\pm15V$, 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	$V^+/V^-=\pm22 \rightarrow \pm11V$	80	100	—	dB
Large Swing Voltage Gain 1	A_{V1}	RL≧2K. $V_O=\pm10V$	88	110	—	dB
Large Swing Voltage Gain 2	A_{V2}	RL≧600. $V_O=\pm10V$	83	104	—	dB
Maximum Output Voltage Swing 1	V_{OH1}	RL≧600	±12	14/−13	—	V
Maximum Output Voltage Swing 2	V_{OH2}	RL≧600. $V^+/V^-=\pm18V$	±15	17/−16	—	V
Input Resistance	R_{IN}		—	100	—	KΩ
Maximum Output Current Swing	I_{OH}		—	60	—	mA

■ ELECTRICAL CHARACTERISTICS

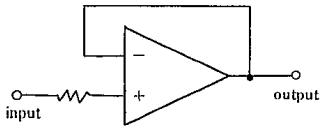
Alternating Current Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	$G_V=20dB$. RL=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}	fo=30Hz	—	5.5	—	nV/$\sqrt{Hz}$
Equivalent input noise voltage	V_{NI}	fo=1kHz	—	3.3	—	nV/$\sqrt{Hz}$
Equivalent input noise current	I_{NI}	fo=30Hz	—	1.5	—	pA/$\sqrt{Hz}$
Equivalent input noise current	I_{NI}	fo=1kHz	—	0.4	—	pA/$\sqrt{Hz}$
Total Harmonic Distotion	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.

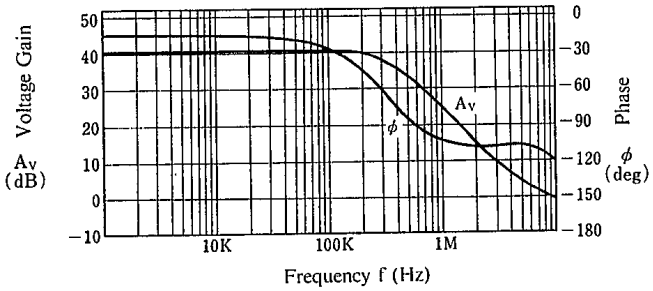
That's why we recommend you to put the current limiting resistor at the input pin.



■ TYPICAL CHARACTERISTICS

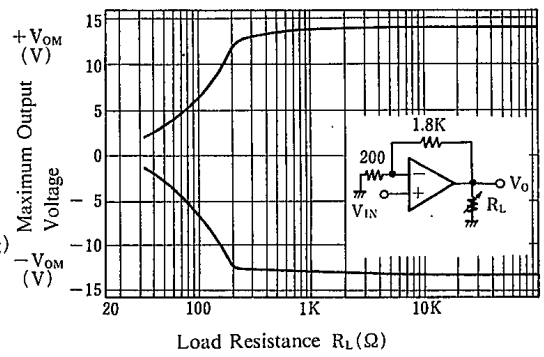
Voltage Gain, Phase vs. Frequency

($V^+/V^-=\pm15V$, $R_L=2K\Omega$, 40dBAmp, Ta=25°C)



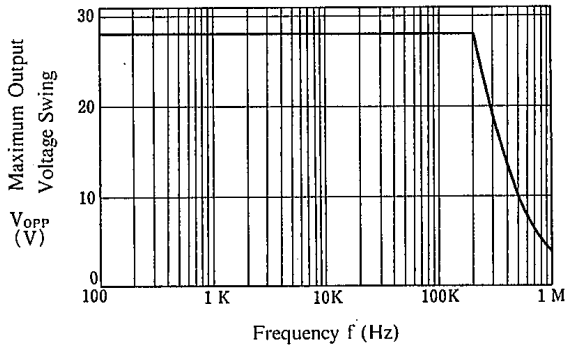
Maximum Output Voltage vs. Load Resistance

($V^+/V^-=\pm15V$, Ta=25°C)



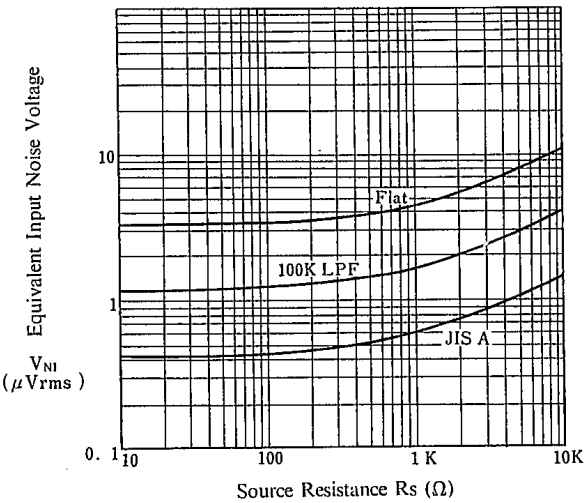
Maximum Output Voltage Swing vs. Frequency

($V^+/V^-=\pm15V$, Ta=25°C)



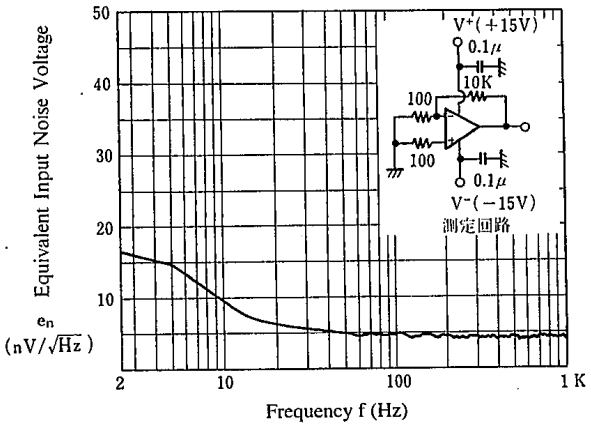
Equivalent Input Noise Voltage vs. Source Resistance

($V^+/V^-=\pm15V$, Ta=25°C)



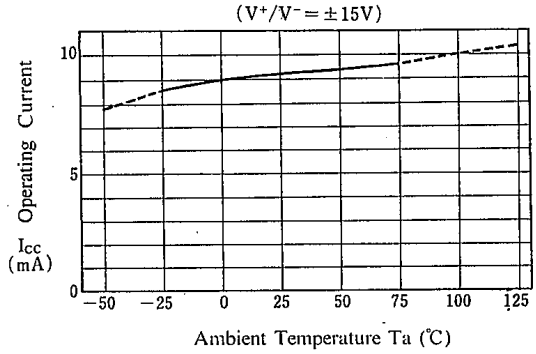
Equivalent Input Noise Voltage vs. Frequency

($V^+/V^-=\pm15V$, $A_V=40dB$)



Operating Current vs. Temperature

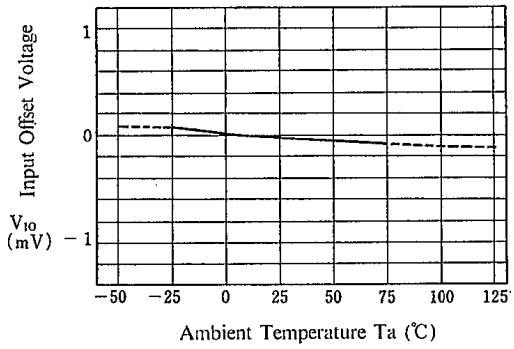
($V^+/V^-=\pm15V$)



■ TYPICAL CHARACTERISTICS

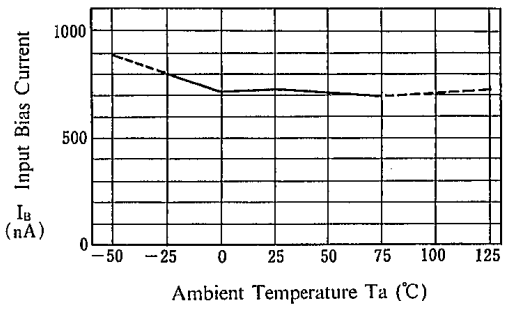
Input Offset Voltage vs. Temperature

($V^+/V^-=\pm15V$)



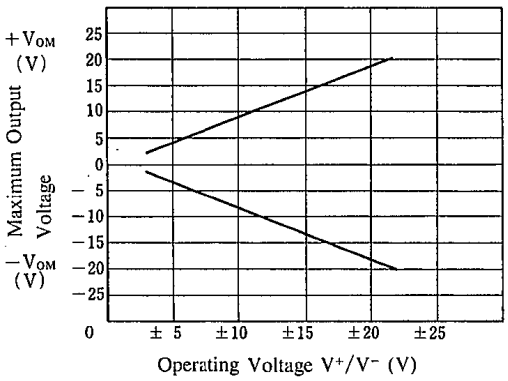
Input Bias Current vs. Temperature

($V^+/V^-=\pm15V$)



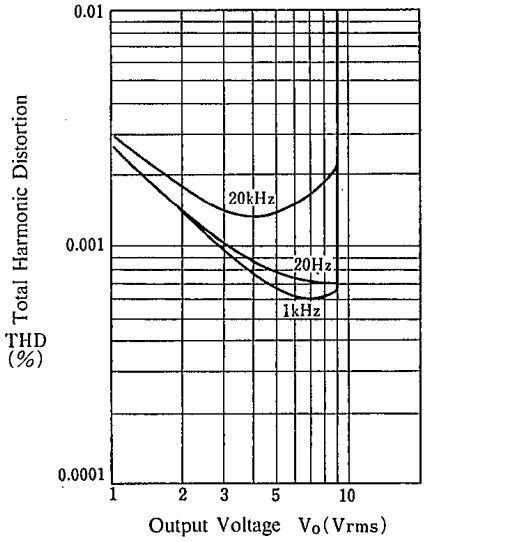
Maximum Output Voltage vs. Operating Voltage

($R_L=600\Omega$, Ta=25°C)



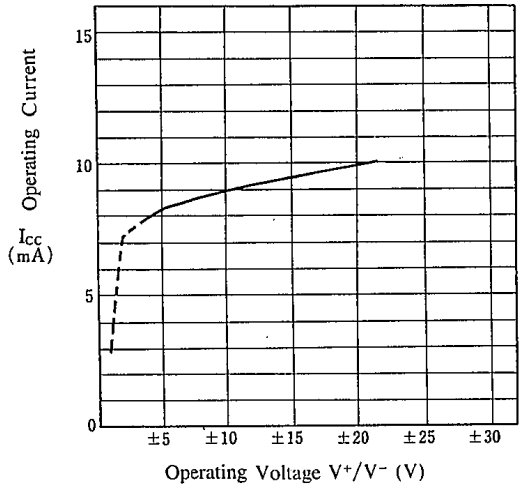
Total Harmonic distortion vs. Output Voltage

($V^+/V^-=\pm15V$, $R_L=10k\Omega$, Gain=20dB, Ta=25°C)



Operating Current vs. Operating Voltage

(Ta=25°C)



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