

J-FET INPUT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

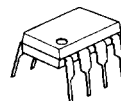
The NJM2162/64 combines feature of the NJM062/064 as well as and providing the capability of wider bandwidth and higher slew rate.

It is suitable for telecom application (active filters etc.).

■ FEATURES

- Operating Voltage ($\pm 2V \sim \pm 18V$)
- High Input Resistance ($10^{12} \Omega$ typ.)
- Low Operating Current (1.2mA typ.)
- High Slew Rate ($10V/\mu s$ typ.)
- J-FET Input
- Wide Unity Gain Bandwidth (3MHz typ.)
- Bipolar Technology
- Package Outline DIP8/14, DMP8/14, SIP8, SSOP8/14

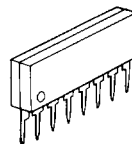
■ PACKAGE OUTLINE



NJM2162D



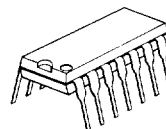
NJM2162M



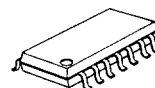
NJM2162L



NJM2162V



NJM2164D

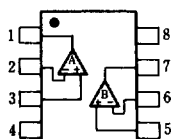
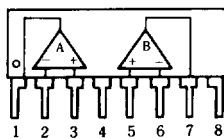


NJM2164M



NJM2164V

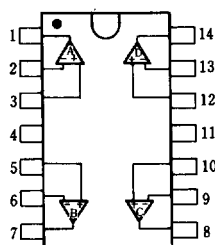
■ PIN CONFIGURATION

NJM2162D
NJM2162M
NJM2162V

NJM2162L

PIN FUNCTION

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

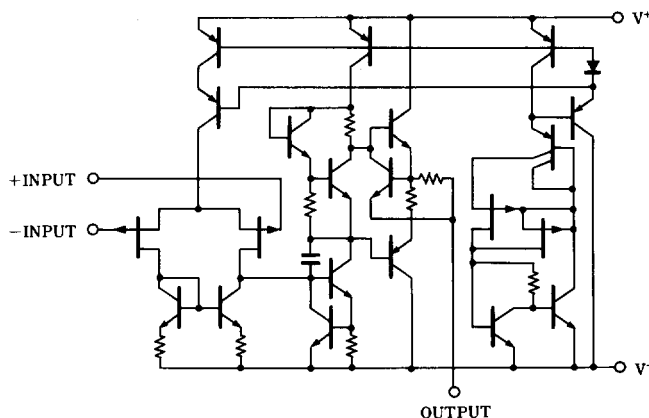
NJM2164D
NJM2164M
NJM2164V

PIN FUNCTION

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

■ EQUIVALENT CIRCUIT

(2162 is 1/2 Shown, 2164 is 1/4 Shown)





■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺ /V ⁻	±18	V
Differential Input Voltage	V _{ID}	±30	V
Input Voltage	V _I	±15 (note 1)	V
Power Dissipation	P _D	(DIP8) 500	mW
		(DIM8) 300	mW
		(SIP8) 800	mW
		(SSOP8) 250	mW
		(DIP14) 700	mW
		(DMP14) 700 (note2)	mW
		(SSOP14) 300	mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

(note 1) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

(note 2) at on PC board

■ ELECTRICAL CHARACTERISTICS

(V⁺/V⁻ = ±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V ⁺ /V ⁻		±2	—	±18	V
Input Offset Voltage	V _{IO}	R _s = 50Ω	—	5	15	mV
Input Offset Current	I _{IO}		—	1	200	pA
Input Bias Current	I _B		—	2	400	pA
Input Common Mode voltage Range	V _{ICM}		±13	+15	—	V
Maximum Peak-to-peak Output Voltage Swing	V _{OM}	R _L = 10Ω	±13	+14	—	V
				-13.5	—	
Large-signal Voltage Gain	A _v	R _L ≥ 10kΩ, V _O = ±10V	70	80	—	dB
Unity Gain Bandwidth	f _T	R _L = 10Ω	—	3	—	MHz
Input Resistance	R _{IN}		—	10 ¹²	—	Ω
Common Mode Rejection Ratio	CMR	R _S ≤ 10kΩ	70	90	—	dB
Supply voltage Rejection Ratio	SVR	R _S ≤ 10kΩ	70	100	—	dB
Operating Current	I _{CC}	R _L = ∞ (1 circuit)	—	0.3	0.45	mA
Slew Rate	SR	R _L = 10kΩ	—	10	—	V/μs
Equivalent Input Noise Voltage	e _n	R _S = 100Ω, f = 1kHz	—	40	—	

(Note) The NJM 2162/64 is the produc in which the AC feature have been made much higher comparing to NJM062/64. Therefore special care being required for the oscillation due to the capacitive load when operation on voltage follower.

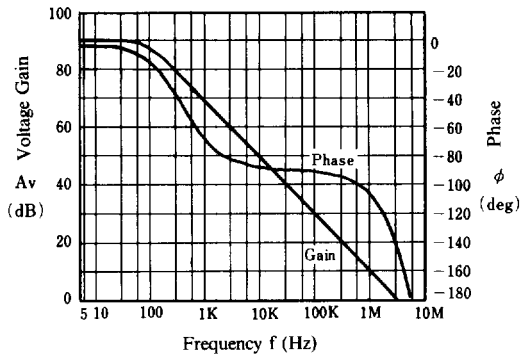
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TYPICAL CHARACTERISTICS

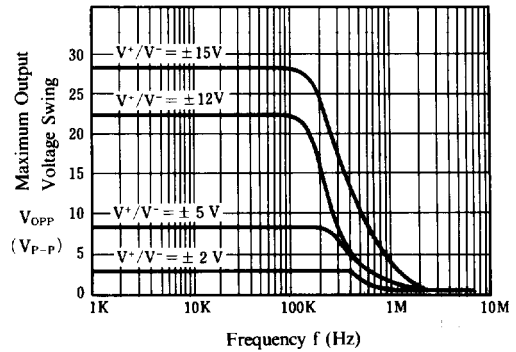
Voltage Gain, Phase Shift vs. Frequency

($V^+/V^- = \pm 15V$, $Z_L = 10k\Omega // 100pF$, $T_a = 25^\circ C$)



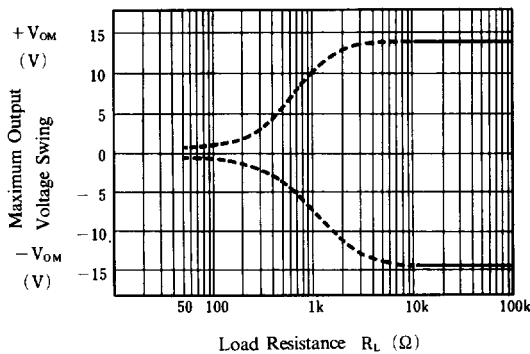
Maximum Output Voltage Swing vs. Frequency

($R_L = 10k\Omega$, $T_a = 25^\circ C$)



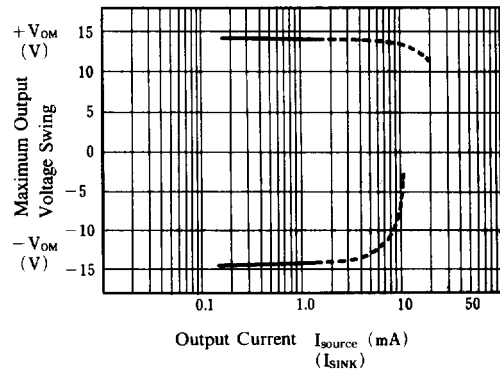
Maximum Output Voltage Swing vs. Load Resistance

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



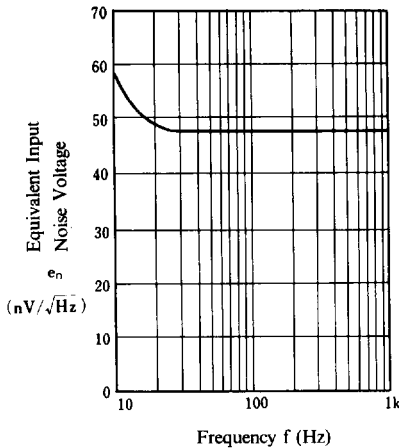
Maximum Output Voltage Swing vs. Output Current

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



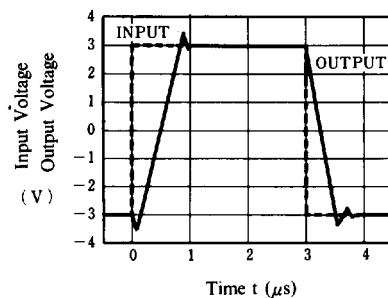
Equivalent Input Noise Voltage vs. Frequency

($V^+/V^- = \pm 15V$, $R_s = 100\Omega$, $T_a = 25^\circ C$)



Voltage Follower Large Signal Pulse Response

($V^+/V^- = \pm 15V$, $R_L = 10k\Omega$, $C_L = 100pF$, $T_a = 25^\circ C$)

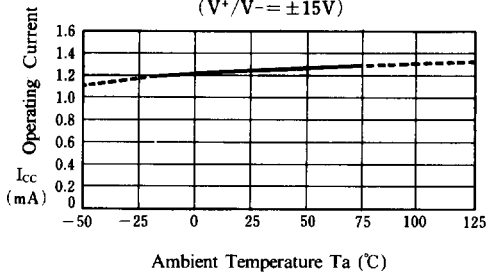




■ TYPICAL CHARACTERISTICS

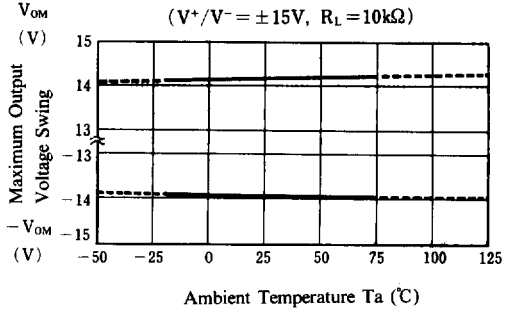
Operating Current vs. Temperature

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



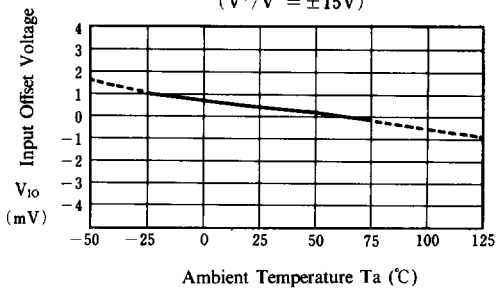
Maximum Output Voltage Swing vs. Temperature

($V^+/V^- = \pm 15V$, $R_L = 10k\Omega$)



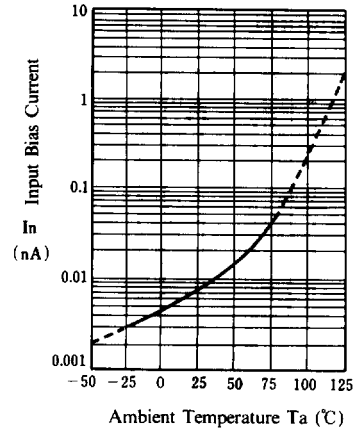
Input offset Voltage vs. Temperature

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



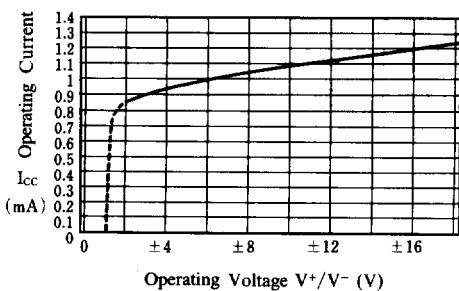
Input Bias Current vs. Temperature

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



Operating Current vs. Operating Voltage

($T_a = 25^\circ C$)



Maximum Output Voltage Swing vs. Operating Voltage

($R_L = 10k\Omega$, $T_a = 25^\circ C$)

