

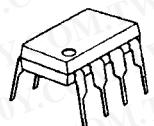
SINGLE-SUPPLY DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM3404A is high performance single supply dual operational amplifier. The NJM3404A is a half type of the NJM3403A, quad operational amplifier.

The NJM3404A is improved version of the NJM2904 on slew rate & cross-over distortion.

■ PACKAGE OUTLINE



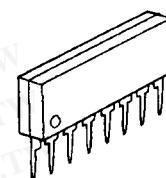
NJM3404AD



NJM3404AM



NIM3404AV

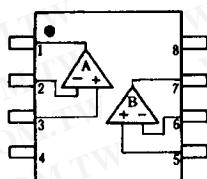


N.JM3404AI

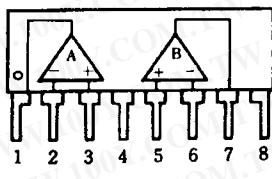
■ FEATURES

- Single Supply
 - Operating Voltage (+4V~+36V)
 - Low Operating Current (2.0mA typ.)
 - Slew Rate (1.2V/ μ s typ.)
 - Package Outline DIP8,DMP8,SIP8,SSOP8
 - Bipolar Technology

■ PIN CONFIGURATION



NJM3404AD
NJM3404AM
NJM3404AV



N.JM3404AI

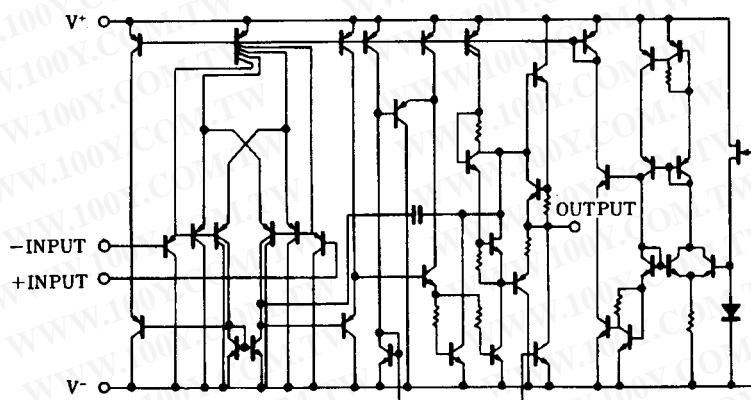
PIN FUNCTION

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

■ EQUIVALENT CIRCUIT (1/2 Shown)

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NJM3404A

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------------|------------------------------------|---|------|
| Supply Voltage | V ⁺ (V ^{+/M}) | 36V (or ±18) | V |
| Differential Input Voltage | V _{ID} | 36 | V |
| Input Voltage | V _{IC} | -0.3~36 | V |
| Power Dissipation | P _D | (DIP8) 500 (DMP8) 300 (SSOP8) 250 (SIP8) 800 | mW |
| Operating Temperature Range | T _{opr} | -40~+85 | °C |
| Storage Temperature Range | T _{stg} | -40~+125 | °C |

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V⁺/V=±15V)

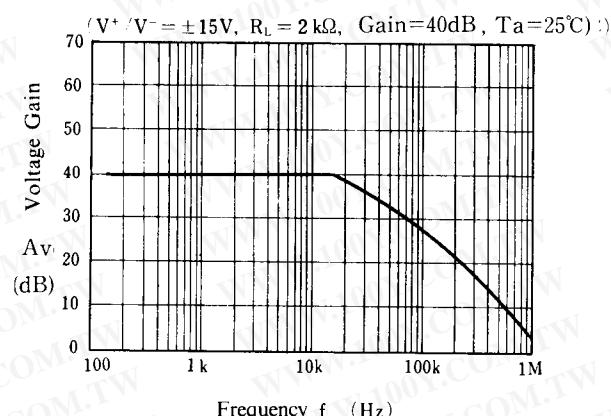
| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|---------------------|--|---------|------|------|------|
| Input Offset Voltage | V _{IO} | R _S =0Ω | - | 2 | 5 | mV |
| Input Offset Current | I _{IO} | | - | 5 | 50 | nA |
| Input Bias Current | I _B | | - | 70 | 200 | nA |
| Large Signal Voltage Gain | A _V | R _L >2kΩ | 88 | 100 | - | dB |
| Maximum Output Voltage Swing | V _{OM} | R _L =2kΩ | ± 13 | ± 14 | - | V |
| Input Common Mode Voltage Range | V _{ICM} | | -15~+13 | - | - | V |
| Common Mode Rejection Ratio | CMR | DC | 70 | 90 | - | dB |
| Supply Voltage Rejection Ratio | SVR | | 80 | 94 | - | dB |
| Operating Current | I _{CC} | R _L =∞ | - | 2.0 | 3.5 | mA |
| Output Source Current | I _{SOURCE} | V _{IN} ⁺ =1V, V _{IN} ⁻ =0V | 20 | 30 | - | mA |
| Output Sink Current | I _{SINK} | V _{IN} ⁺ =0V, V _{IN} ⁻ =1V | 10 | 20 | - | mA |
| Slew Rate | SR | | - | 1.2 | - | V/μs |
| Unity Gain Bandwidth | f _T | - | - | 1.2 | - | MHz |

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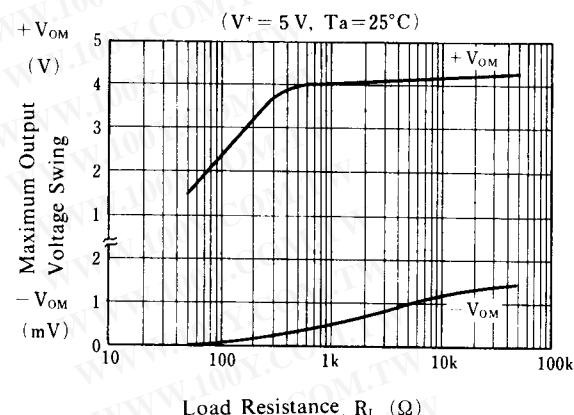
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■ TYPICAL CHARACTERISTICS

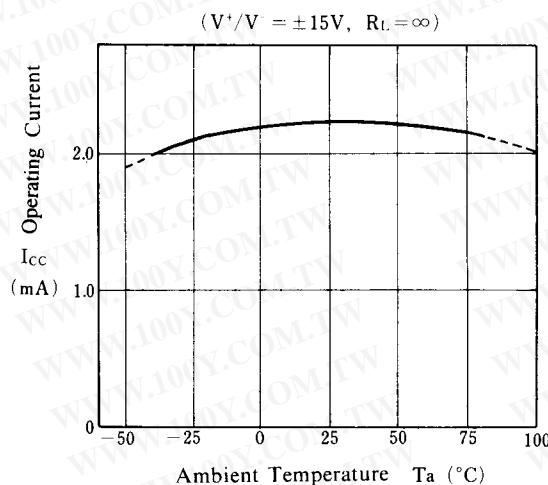
Voltage Gain vs. Frequency



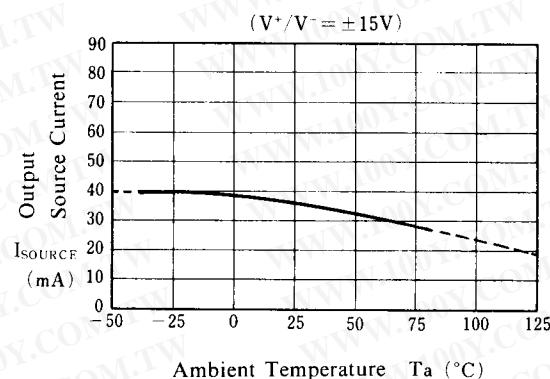
Maximum Output Voltage Swing vs. Load Resistance



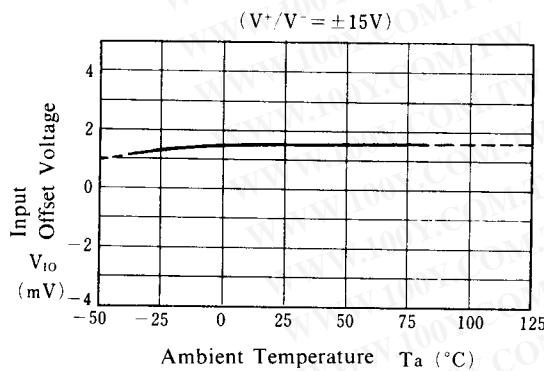
Operating Current vs. Temperature



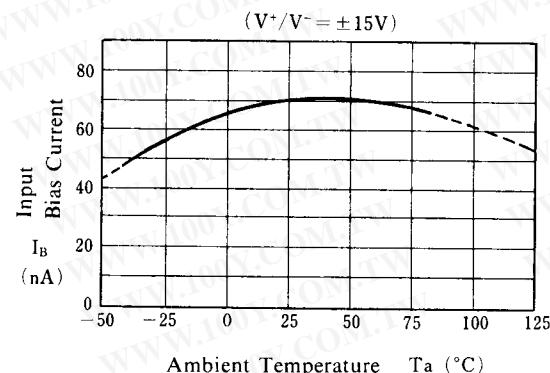
Output Source Current vs. Temperature



Input Offset Voltage vs. Temperature



Input Bias Current vs. Temperature



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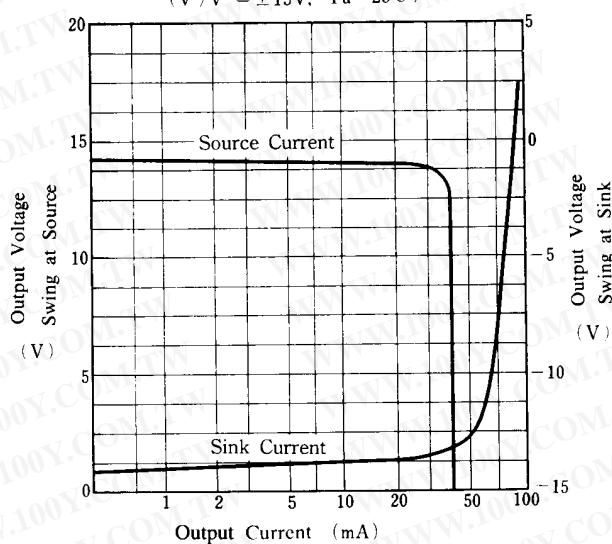
■ TYPICAL CHARACTERISTICS

Output Source Current

Output Sink Current

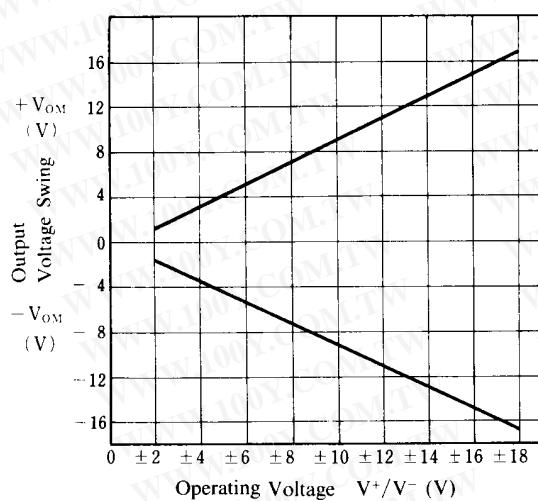
vs. Output Voltage Swing

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



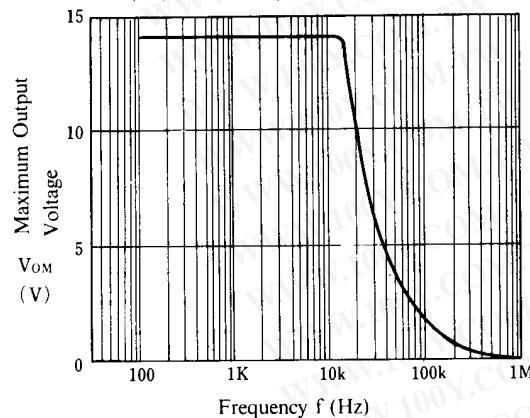
Output Voltage Swing vs. Operating Voltage

($R_L = 2k\Omega$, $T_a = 25^\circ C$)

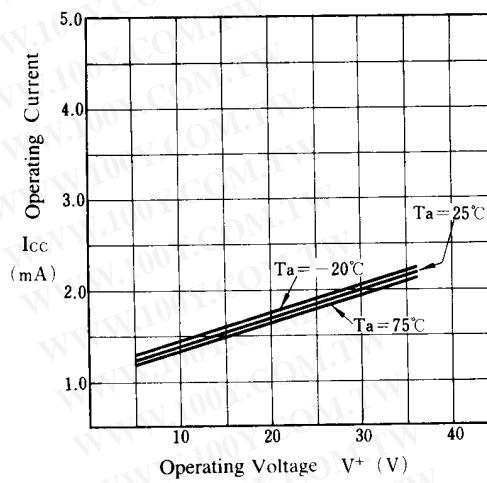


Maximum Output Voltage vs. Frequency

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

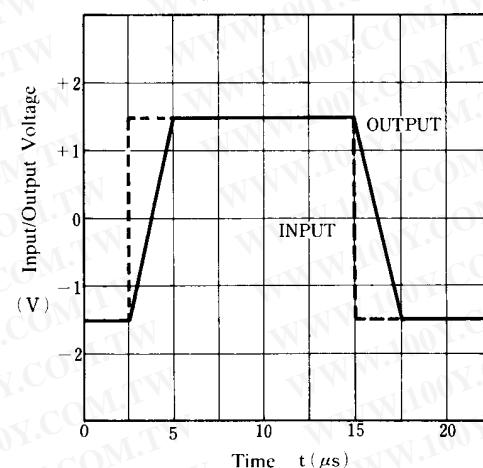


Operating Current vs. Operating Voltage



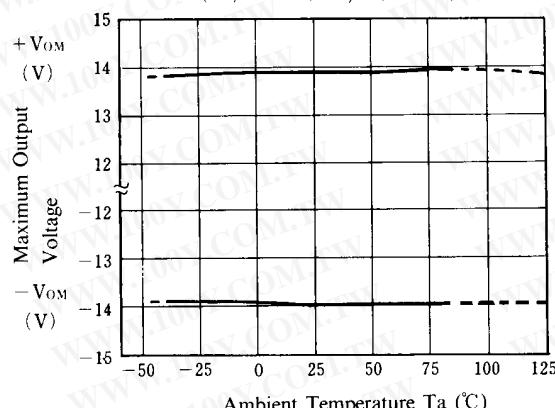
Pulse Response

($V^+/V^- = \pm 15$, $R_L > 2k\Omega$, $A_v = 1$, $T_a = 25^\circ C$)



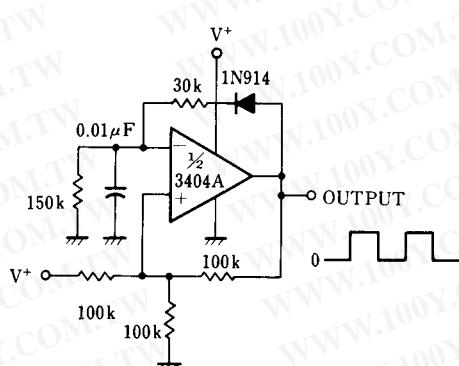
Maximum Output Voltage vs. Temperature

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$)

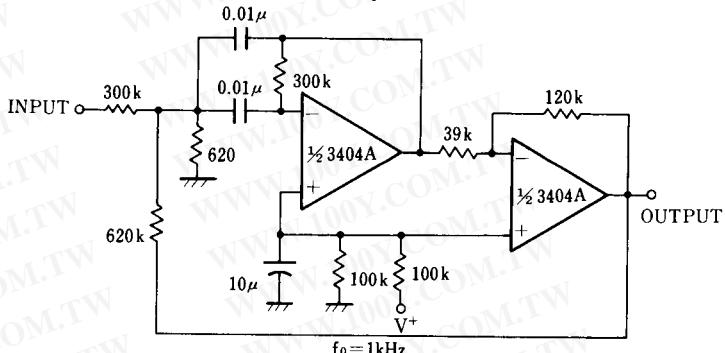


■ TYPICAL APPLICATIONS

Square Wave Oscillator



Bandpass Filter



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