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.

■ FEATURES

- Single Supply
- Operating Voltage (+4V~+36V)
- Low Operating Current (2.0mA typ.)
- Slew Rate (1.2V/µs typ.)
- Package Outline DIP8,DMP8,SIP8,SSOP8
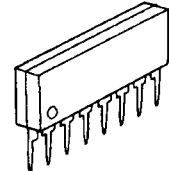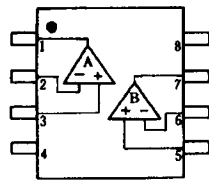- Bipolar Technology
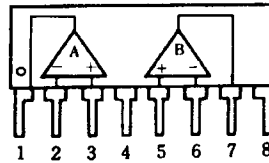
■ PACKAGE OUTLINE
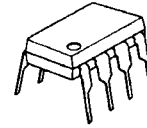
NJM3404AD

NJM3404AM

NJM3404AV

NJM3404AL

■ PIN CONFIGURATION
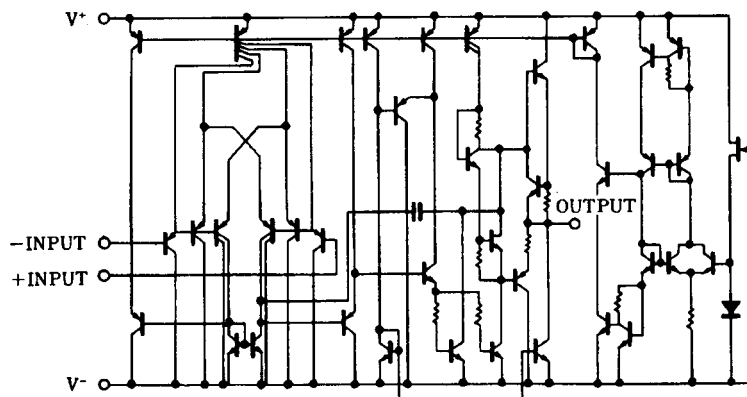
NJM3404AD
NJM3404AM
NJM3404AV

NJM3404AL

PIN FUNCTION
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)

V^+

$-$INPUT
$+$INPUT

OUTPUT

V^-

NJM3404A

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+(V^+/V^-)$	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

■ TYPICAL CHARACTERISTICS

Voltage Gain vs. Frequency

$(V^+/V^- = \pm 15V, \ R_L = 2 \, k\Omega, \ Gain = 40dB, \ Ta = 25°C)$
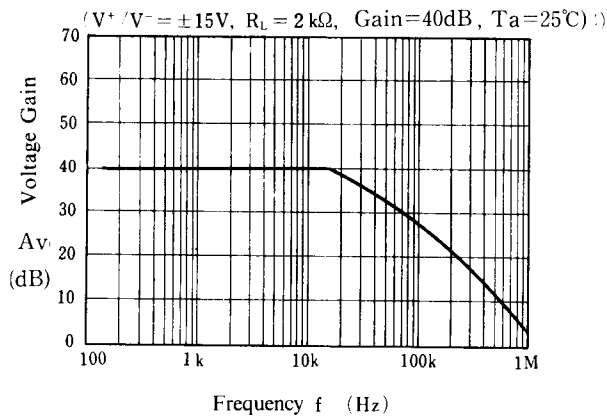
Maximum Output Voltage Swing vs. Load Resistance

$(V^+ = 5 \, V, \ Ta = 25°C)$
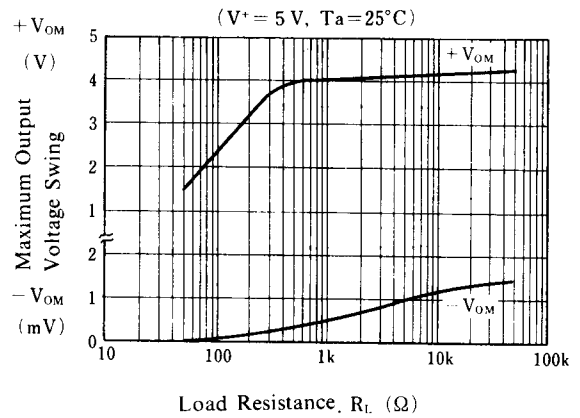
Operating Current vs. Temperature

$(V^+/V^- = \pm 15V, \ R_L = \infty)$
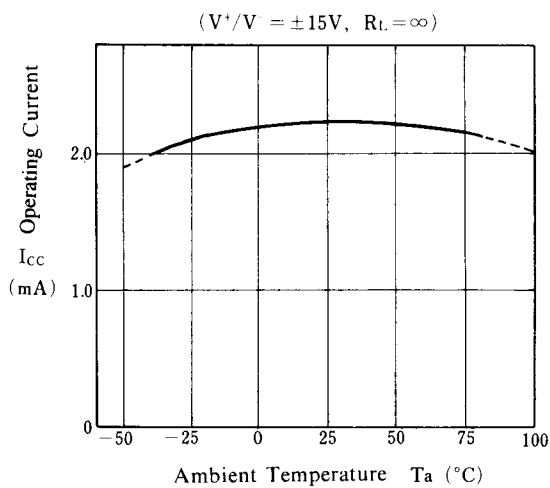
Output Source Current vs. Temperature
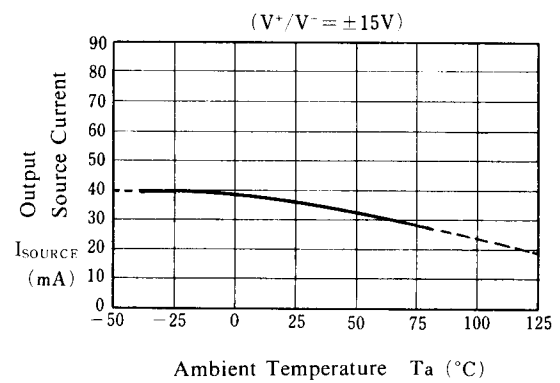
$(V^+/V^- = \pm 15V)$

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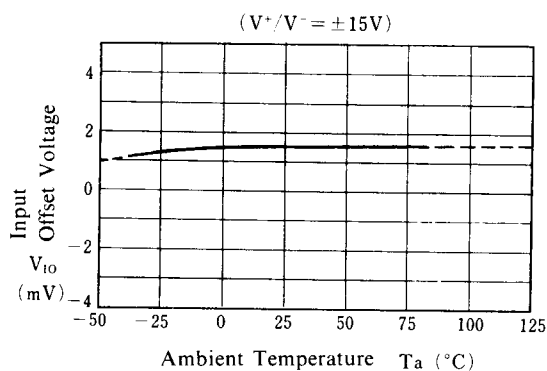
$(V^+/V^- = \pm 15V)$

Input Bias Current vs. Temperature

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

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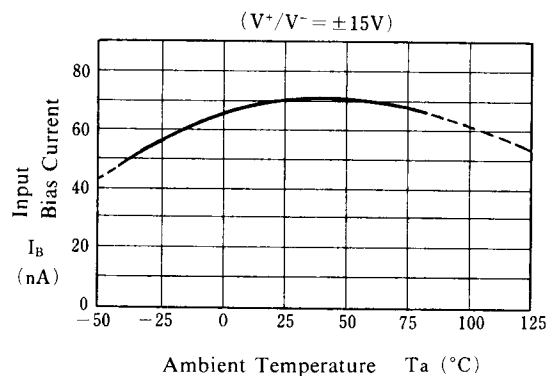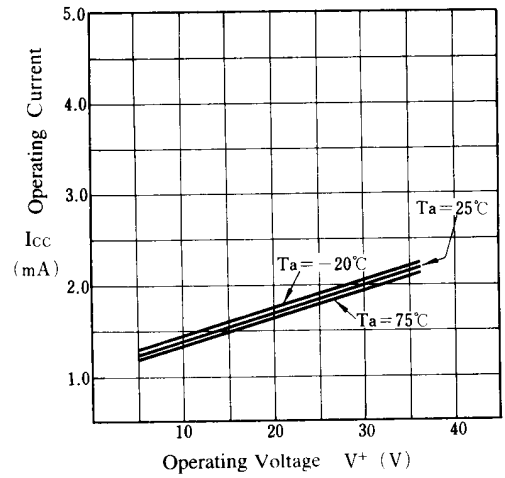
NJM3404A

■ TYPICAL CHARACTERISTICS

Output Source Current / Output Sink Current vs. Output Voltage Swing
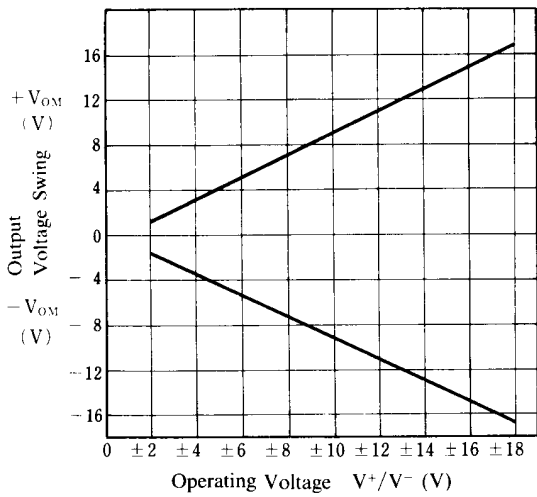
$(V^+/V^- = \pm 15V, \ Ta = 25°C)$
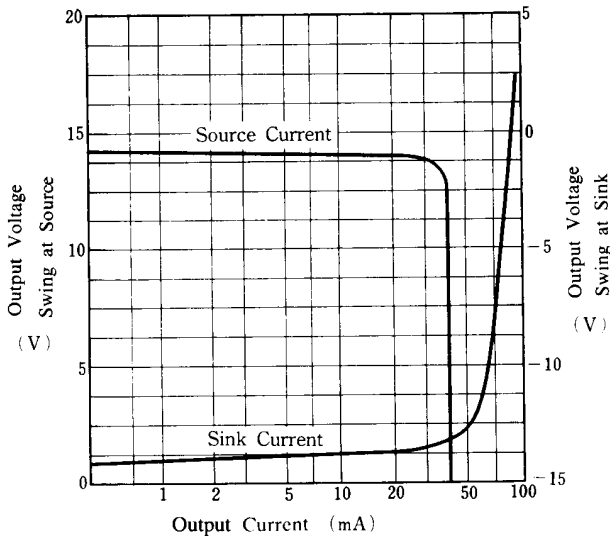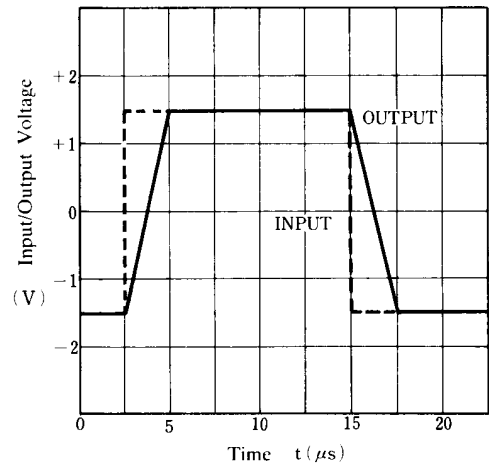

Operating Current vs. Operating Voltage

Output Voltage Swing vs. Operating Voltage

$(R_L = 2k\Omega, \ Ta = 25°C)$

Pulse Response

$(V^+/V^- = \pm 15, \ R_L > 2k\Omega, \ Av = 1, \ Ta = 25°C)$

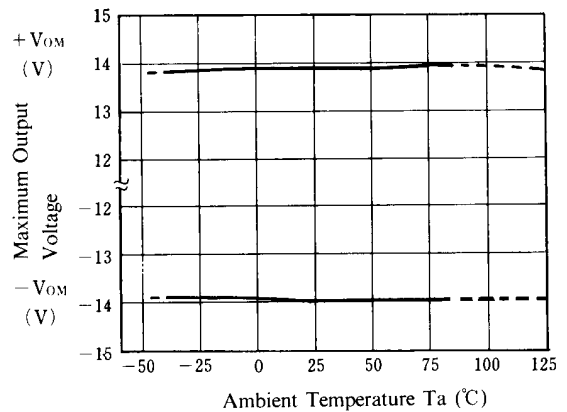### Maximum Output Voltage vs. Frequency

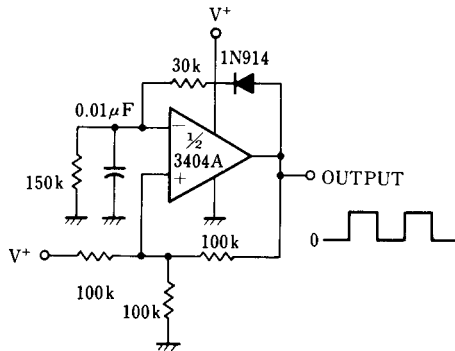$(V^+/V^- = \pm 15V, \ R_L = 2k\Omega, \ Ta = 25°C)$
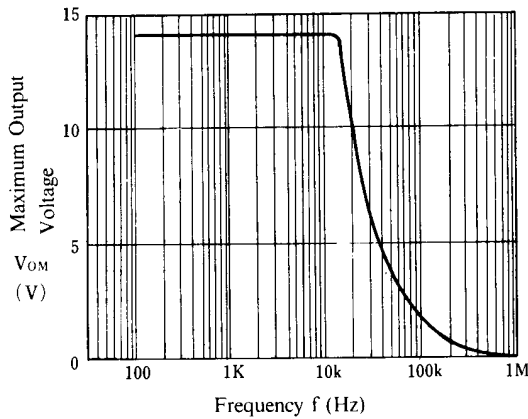
Maximum Output Voltage vs. Temperature
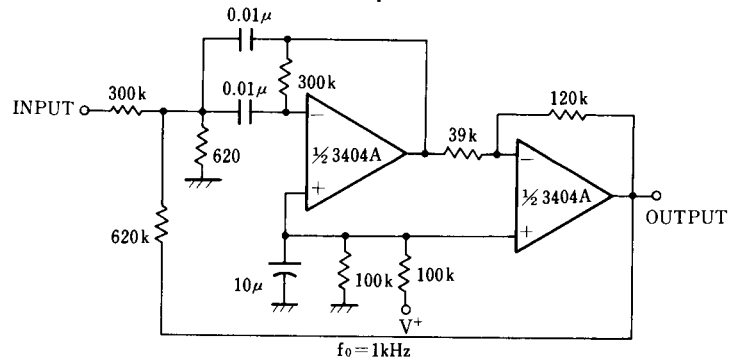
$(V^+/V^- = \pm 15V, \ R_L = 2k\Omega)$

■ TYPICAL APPLICATIONS

Square Wave Oscillator

Bandpass Filter

$f_0 = 1kHz$

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