

## DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

### ■ GENERAL DESCRIPTION

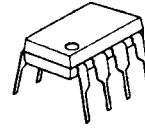
The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving  $\pm 70\text{mA}$  into  $150\Omega$  loads ( $\pm 10.5\text{V}$  output voltage), and operating low supply voltage ( $V^+V^- = \pm 2\text{V} \sim$ ).

The NJM4556A combines many of the features of the popular NJM4558 as well as having the capability of driving  $150\Omega$  loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommunications and instrumentation applications.

### ■ FEATURES

- Supply Voltage ( $\pm 2\text{V} \sim \pm 18\text{V}$ )
- High Output Current ( $I_O = 70\text{mA}$ )
- Slew Rate ( $3\text{V}/\mu\text{s}$  typ.)
- Gain Band Width Product ( $8\text{MHz}$  typ.)
- Equivalent Input Noise Voltage ( $10\text{nV}/\sqrt{\text{Hz}}$  typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

### ■ PACKAGE OUTLINE



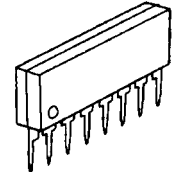
NJM4556AD



NJM4556AM

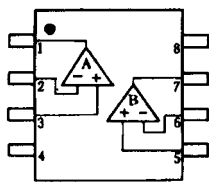


NJM4556AV

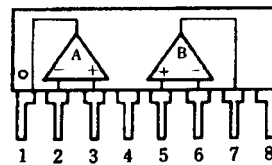


NJM4556AL

### ■ PIN CONFIGURATION



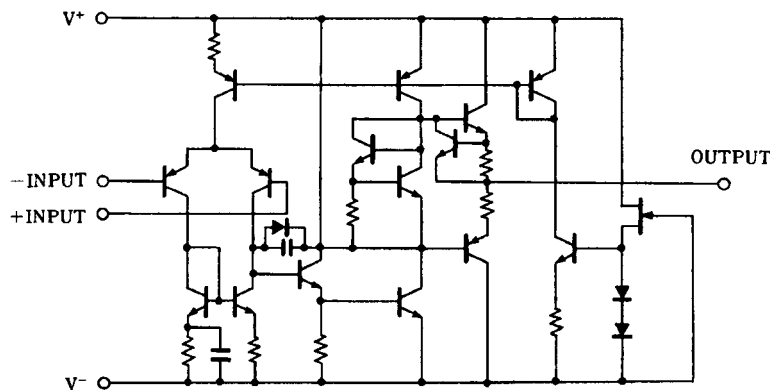
NJM4556AD  
NJM4556AM  
NJM4556AV



NJM4556AL

- 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)



# NJM4556A

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup> /V <sup>-</sup>	± 18	V
Differential Input Voltage	V <sub>ID</sub>	± 30	V
Input Voltage	V <sub>IC</sub>	± 15 (note)	V
Power Dissipation	P <sub>D</sub>	(DIP8) 700 (DMP8) 300 (SSOP8) 250 (SIP8) 800	mW
Operating Temperature Range	T <sub>opr</sub>	-40~+85	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C

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

## ■ ELECTRICAL CHARACTERISTICS (NJM4556AD / NJM4556AL)

(V<sup>+</sup>/V<sup>-</sup>=±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> ≤10kΩ	-	0.5	6.0	mV
Input Offset Current	I <sub>IO</sub>		-	5	60	nA
Input Bias Current	I <sub>B</sub>		-	50	500	nA
Input Resistance	R <sub>IN</sub>		0.3	5	-	MΩ
Large Signal Voltage Gain	A <sub>V</sub>	R <sub>L</sub> ≥2kΩ, V <sub>O</sub> =±10V	86	100	-	dB
Maximum Output Voltage Swing 1	V <sub>OM1</sub>	R <sub>L</sub> ≥2kΩ	± 12	± 13.5	-	V
Maximum Output Voltage Swing 2	V <sub>OM2</sub>	R <sub>L</sub> ≥150Ω	± 10.5	± 11	-	V
Input Common Mode Voltage Range	V <sub>ICM</sub>		± 13.5	± 14	-	V
Common Mode Rejection Ratio	CMR	R <sub>S</sub> ≤10kΩ	70	90	-	dB
Supply Voltage Rejection Ratio	SVR	R <sub>S</sub> ≤10kΩ	76.5	90	-	dB
Supply Current	I <sub>CC</sub>		-	9	12	mA
Slew Rate	SR		-	3	-	V/μs
Gain Bandwidth Product	GB		-	8	-	MHz

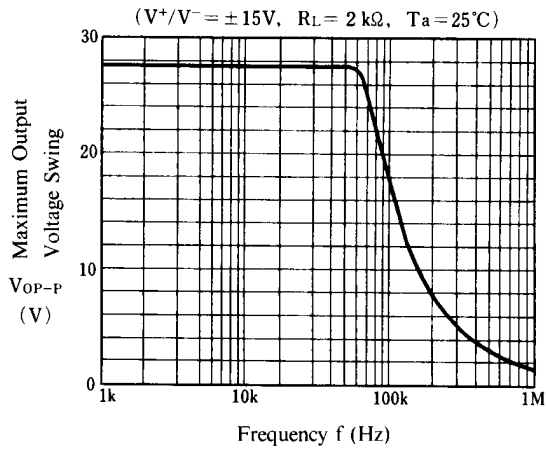
## ■ ELECTRICAL CHARACTERISTICS (NJM4556AM / NJM4556AV)

(V<sup>+</sup>/V<sup>-</sup>=±15V, Ta=25°C)

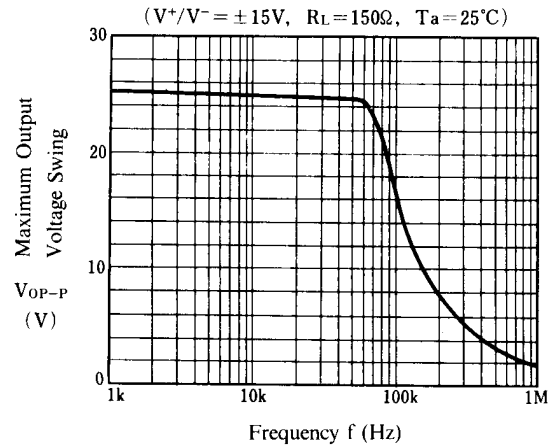
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> ≤10kΩ	-	0.5	6.0	mV
Input Offset Current	I <sub>IO</sub>		-	5	60	nA
Input Bias Current	I <sub>B</sub>		-	50	500	nA
Large Signal Voltage Gain	A <sub>V</sub>	R <sub>L</sub> ≥2kΩ, V <sub>O</sub> =±10V	86	100	-	dB
Maximum Output Voltage Swing 1	V <sub>OM1</sub>	V <sub>IN</sub> <sup>+</sup> =4V, V <sub>IN</sub> <sup>-</sup> =3V, V <sup>+</sup> =9V, V <sup>-</sup> =0V I <sub>SOURCE</sub> =40mA	7.5	-	-	V
Maximum Output Voltage Swing 2	V <sub>OM2</sub>	V <sub>IN</sub> <sup>+</sup> =3V, V <sub>IN</sub> <sup>-</sup> =4V, V <sup>+</sup> =9V, V <sup>-</sup> =0V I <sub>SINK</sub> =40mA	-	-	2.1	V
Input Common Mode Voltage Range 1	V <sub>ICM1</sub>	V <sup>+</sup> =9V, V <sup>-</sup> =0V, V <sub>IL</sub>	-	-	1.5	V
Input Common Mode Voltage Range 2	V <sub>ICM2</sub>	V <sup>+</sup> =9V, V <sup>-</sup> =0V, V <sub>IH</sub>	8	-	-	V
Common Mode Rejection Ratio	CMR	R <sub>S</sub> ≤10kΩ	70	90	-	dB
Supply Voltage Rejection Ratio	SVR	R <sub>S</sub> ≤10kΩ	76.5	90	-	dB
Supply Current	I <sub>CC</sub>	V <sup>+</sup> =9V, V <sup>-</sup> =0V	-	8	12	mA
Slew Rate	SR		-	3	-	V/μs
Gain Bandwidth Product	GB		-	8	-	MHz

## ■ TYPICAL CHARACTERISTICS

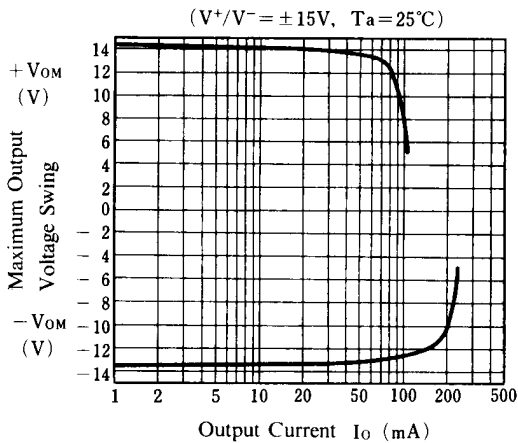
**Maximum Output Voltage Swing vs. Frequency**



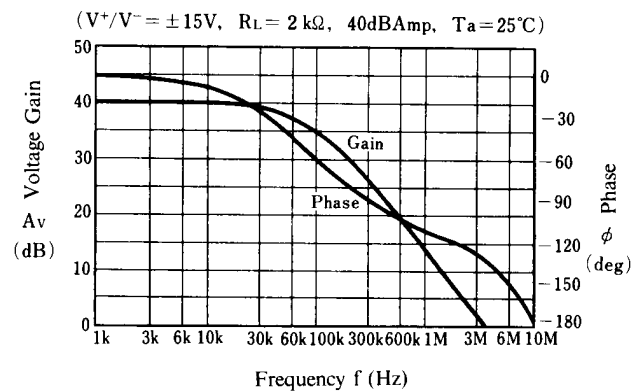
**Maximum Output Voltage Swing vs. Frequency**



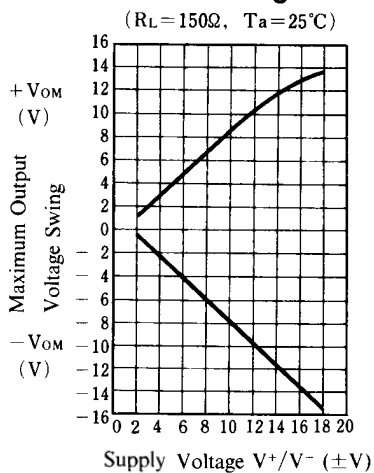
**Maximum Output Voltage Swing vs. Output Current**



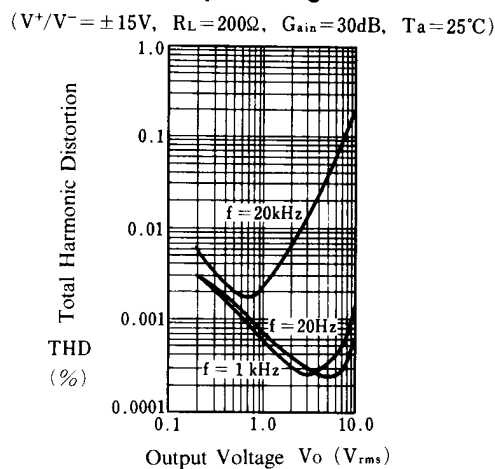
**Voltage Gain, Phase Shift vs. Frequency**



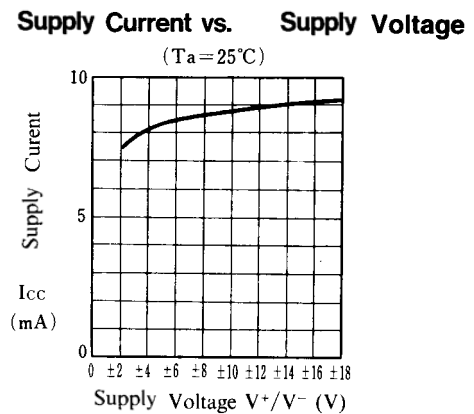
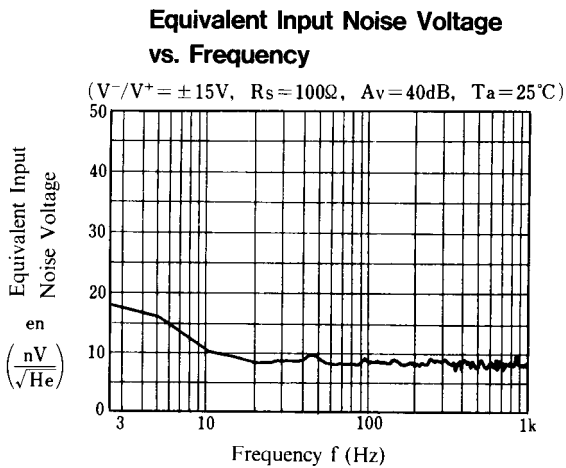
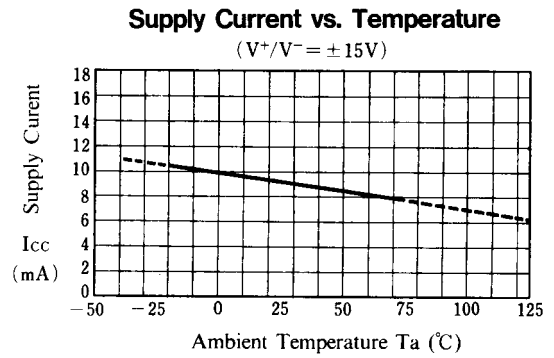
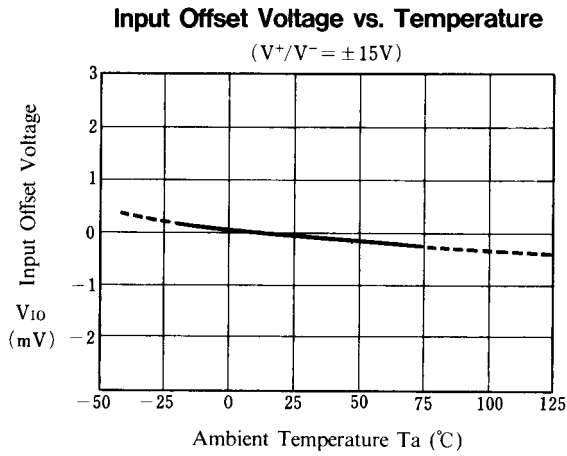
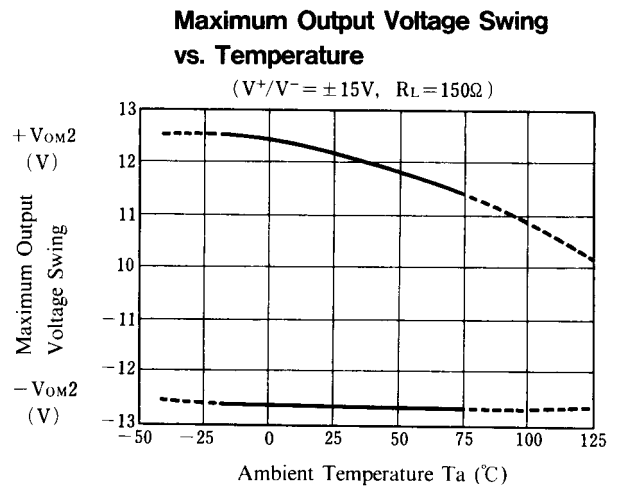
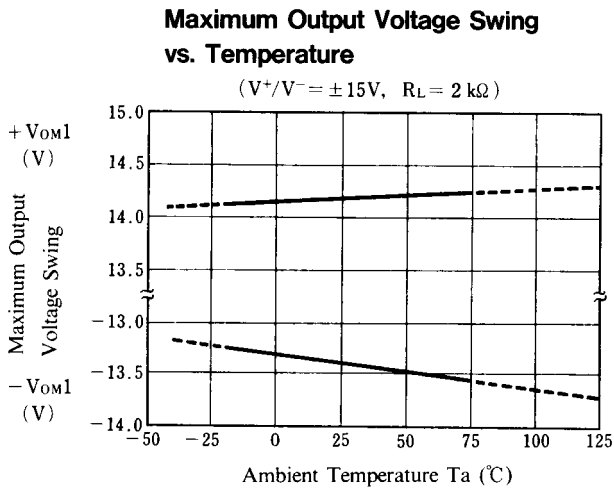
**Maximum Output Voltage Swing vs. Supply Voltage**



**Total Harmonic Distortion vs. Output Voltage**



## ■ TYPICAL CHARACTERISTICS



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