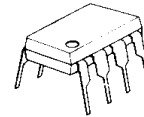# NJM4556

The NJM4556 integrated circuit is a high-gain, high output current dual operational amplifier capable of driving ± 70mA into 150Ω loads (±10.5V output voltage). The NJM4556 combines many of the features of the popular NJM4558 as well as having the capability of driving 150Ω loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556 make it ideal for many audio, telecommunications and instrumentation applications.

■ Absolute Maximum Ratings (Ta=25°C)

|		
Supply Voltage	V^+/V^-	±18V
Differential Input Voltage	V_{ID}	±30V
Input Voltage(note)	V_I	±15V
Power Dissipation	P_D (D-Type)	700mW
	(M-Type)	300mW
	(L-Type)	800mW
Operating Temperature Range	T_{opr}	−20~+75°C
Storage Temperature Range	T_{stg}	−40~+125°C

(note) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
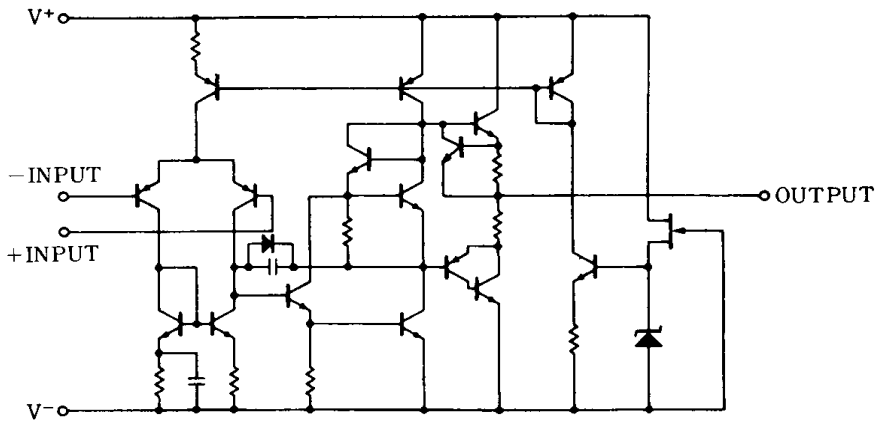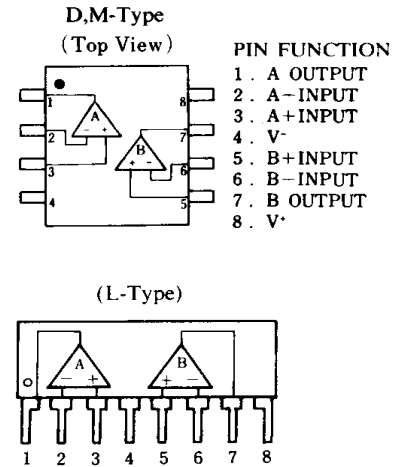
■ Package Outline
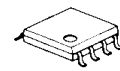
NJM4556D   NJM4556M-B
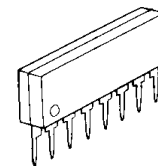
NJM4556L

■ Electrical Characteristics (NJM4556D/NJM4556L)(Ta=25°C, $V^+/V^- = \pm 15V$)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Offset Voltage	V_{IO}	$R_S \leq 10k\Omega$	—	0.5	6	mV
Input Offset Current	I_{IO}		—	±5	±60	nA
Input Bias Current	I_B		—	180	500	nA
Large Signal Voltage Gain	R_{IN}		0.3	5	—	MΩ
Large Signal Voltage Gain	A_V	$R_L \geq 2k\Omega$, $V_O = \pm 10V$	86	100	—	dB
Maximum Output Voltage Swing 1	V_{OM1}	$R_L \geq 2k\Omega$	±12	±13.5	—	V
Maximum Output Voltage Swing 2	V_{OM2}	$R_L \geq 150\Omega$	±10.5	±11	—	V
Input Common Mode Voltage Range	V_{ICM}		±12	±14	—	V
Common Mode Rejection Ratio	CMR	$R_S \leq 10k\Omega$	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10k\Omega$	76.5	90	—	dB
Supply Current	I_{CC}		—	9	12	mA
Slew Rate	SR		—	3	—	V/μS
Unity Gain Bandwidth	GB		—	8	—	MHz

NJM4556

■ Equivalent Circuit (½ Shown)

■ Connection Diagram

D,M-Type
(Top View)

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

(L-Type)

■ Electrical Characteristics (NJM4556M-B) ($V^+/V^- = \pm 15V$, Ta=25°C)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Offset Voltage	V_{IO}	$R_S \leqq 10k\Omega$	—	0.5	0.5	mV
Input Offset Current	I_{IO}		—	30	60	nA
Input Bias Current	I_B		—	250	500	nA
Large Signal Voltage Gain	A_V	$R_L \geqq 2k\Omega$, $V_O = \pm 10V$	86	100	—	dB
Maximum Output Voltage Swing 1	V_{OM1}	$V_{IN}^+ = 4V$, $V_{IN}^- = 3V$, $V^+ = 9V$ $I_{SOURCE} = 40mA$	7.5			V
Maximum Output Voltage Swing 2	V_{OM2}	$V_{IN}^+ = 3V$, $V_{IN}^- = 4V$, $V^+ = 9V$ $I_{SINK} = 40mA$	—	—	2.1	V
Input Common Mode Voltage Range 1	V_{ICM1}	$V^+ = 9V$, V_{IL}	—	—	1.5	V
Input Common Mode Voltage Range 2	V_{ICM2}	$V^+ = 9V$, V_{IH}	8	—	—	V
Common Mode Rejection Ratio	CMR	$R_S \leqq 10k\Omega$	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	$R_S \leqq 10k\Omega$	76.5	90	—	dB
Power Dissipation	P_D	$V^+ = 9V$	—	80	135	mW

■ Typical Characteristics

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

Ambient Temperature Ta (°C)
I_B (nA)
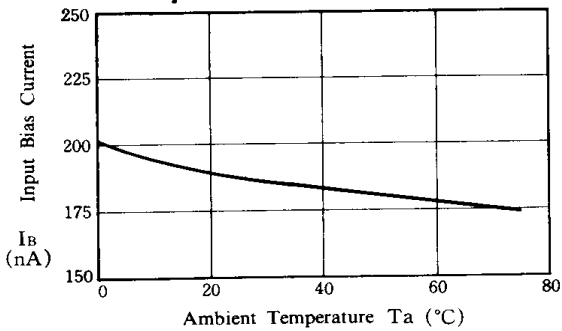
Maximum Output Voltage Swing vs. Load Resistance
(Ta=25°C, THD=1%)

$V^+/V^- = \pm 15V$
$V^+/V^- = \pm 10V$
$V^+/V^- = \pm 5V$

Load Resistance R_L (Ω)
Maximum Output Voltage Swing V_{OPP} (V)
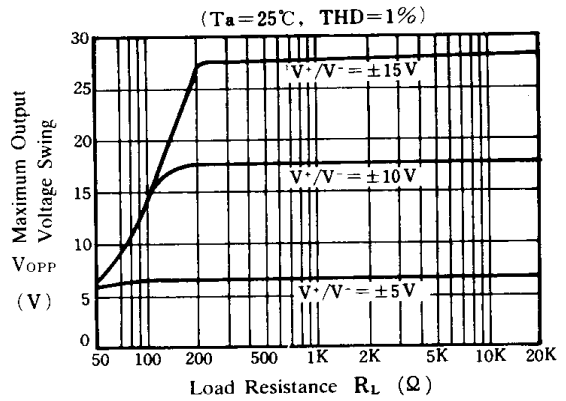
Maximum Output Voltage Swing vs. Supply Voltage
$(R_L = 150\Omega, Ta = 25°C)$

$+V_{OM}$
$-V_{OM}$

Supply Voltage V^+/V^- ($\pm V$)
Maximum Output Voltage Swing V_{OM} (V)
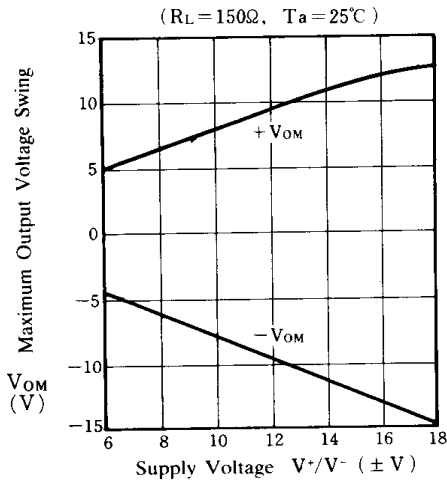
Equivalent Input Noise Voltage vs. Frequency
$(V^+/V^- = \pm 15V, Rs = 50\Omega, Av = 60dB, Ta = 25°C)$

Frequency f (Hz)
Equivalent Input Noise Voltage V_{NI} $\left(\frac{nV}{\sqrt{Hz}}\right)$
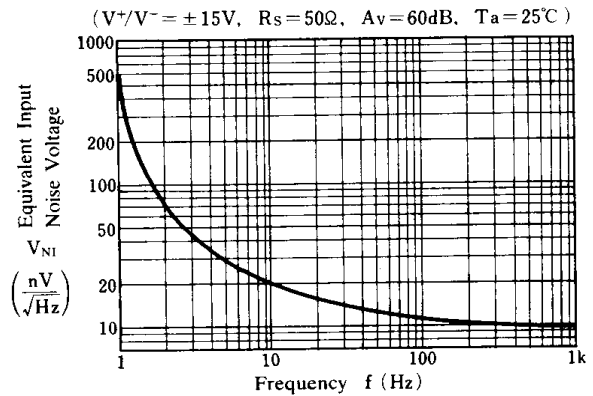
Open Loop Voltage Gain vs. Frequency
$(V^+/V^- = \pm 15V, R_L = 150\Omega, Ta = 25°C)$

Frequency f (Hz)
Open Loop Voltage Gain A_V (dB)
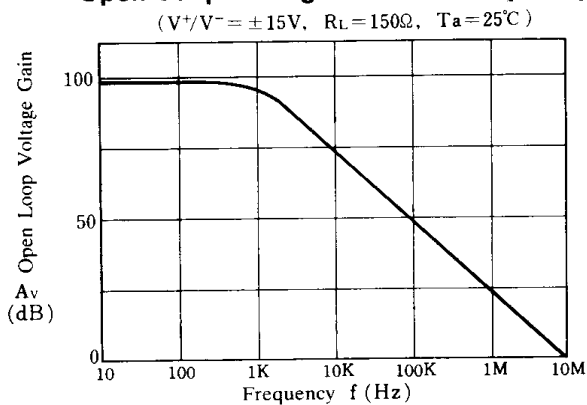
Maximum Output Voltage Swing vs. Frequency
$(V^+/V^- = \pm 15V, Ta = 25°C)$

$R_L = 2k\Omega$
$R_L = 150\Omega$
$R_L = 150\Omega$, THD < 1.0%

Frequency f (Hz)
Maximum Output Voltage Swing V_{OPP} (V)
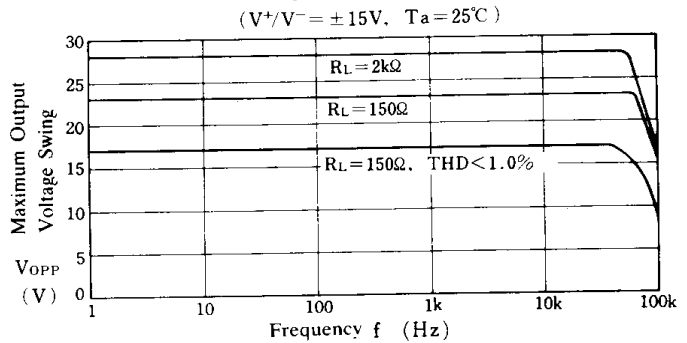
Total Harmonic Distortion vs. Output Voltage
$(V^+/V^- = \pm 15V, Av = 30dB, R_L = 200\Omega, Ta = 25°C)$

20kHz
1kHz
20Hz

Output Voltage V_O (Vrms)
Total Harmonic Distortion THD (%)