

DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

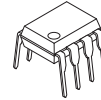
The NJM4558/4559 integrated circuit is a dual high-gain operational amplifier internally compensated and constructed on a single silicon chip using an advanced epitaxial process.

Combining the features of the NJM741 with the close parameter matching and tracking of a dual device on a monolithic chip results in unique performance characteristics. Excellent channel separation allows the use of the dual device in single NJM741 operational amplifier applications providing density. It is especially well suited for applications in differential-in, differential-out as well as in potentiometric amplifiers and where gain and phase matched channels are mandatory.

■ FEATURES

- Operating Voltage ($\pm 4V \sim \pm 18V$)
- High Voltage Gain (100dB typ.)
- High Input Resistance ($5M\Omega$ typ.)
- Bipolar Technology
- Package Outline
 DIP8, DMP8, SIP8
 SOP8 JEDEC 150mil (only NJM4558),
 SSOP8 (only NJM4558)

■ PACKAGE OUTLINE



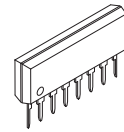
**NJM4558D
NJM4559D
(DIP8)**



**NJM4558M
NJM4559M
(DMP8)**



**NJM4558V
(SSOP8)**

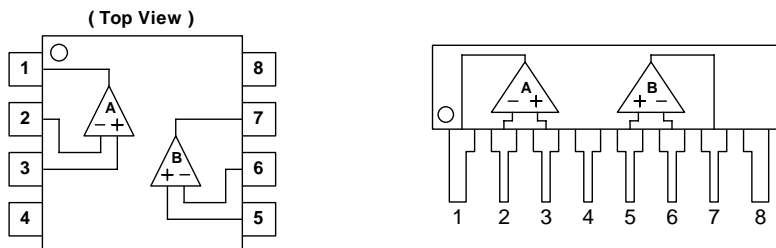


**NJM4558L
NJM4559L
(SIP8)**



**NJM4558E
(SOP8)**

■ PIN CONFIGURATION



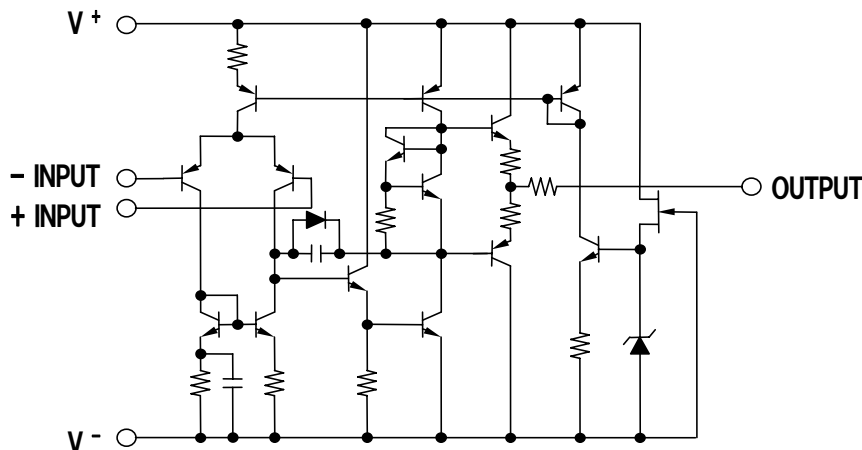
**NJM4558D, NJM4558M, NJM4558E, NJM4558V
NJM4559D, NJM4559M**

**NJM4558L
NJM4559L**

PIN FUNCTION

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

■ EQUIVALENT CIRCUIT (1/2 Shown)



NJM4558/4559

■ 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 _{IC} | ± 15 (note1) | V |
| Power Dissipation | P _D | (DIP8) 500 (DMP8) 300 (SOP8) 300 (SSOP8) 250 (SIP8) 800 | mW |
| Operating Temperature Range | T _{opr} | -40~+85 | °C |
| Storage Temperature Range | T _{stg} | -40~+125 | °C |

(note1) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

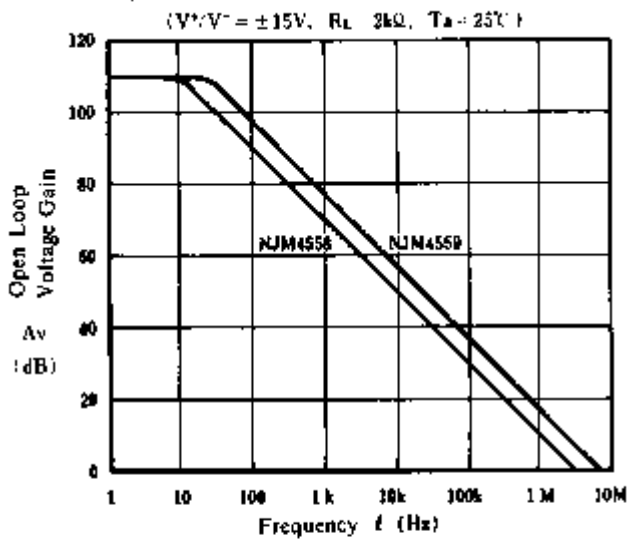
(V⁺/V⁻=±15V, Ta=25°C)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--|------------------|---|------|------|------|-------|
| Input Offset Voltage | V _{IO} | R _S ≤10kΩ | - | 0.5 | 6 | mV |
| Input Offset Current | I _{IO} | | - | 5 | 200 | nA |
| Input Bias Current | I _B | | - | 25 | 500 | nA |
| Input Resistance | R _{IN} | | 0.3 | 5 | - | MΩ |
| Large Signal Voltage Gain | A _V | R _L ≥2kΩ, V _O =±10V | 86 | 100 | - | dB |
| Maximum Output Voltage Swing 1 | V _{OM1} | R _L ≥10kΩ | ± 12 | ± 14 | - | V |
| Maximum Output Voltage Swing 2 | V _{OM2} | R _L ≥2kΩ | ± 10 | ± 13 | - | V |
| Input Common Mode Voltage Range | V _{ICM} | | ± 12 | 14 | - | V |
| Common Mode Rejection Ratio | CMR | R _S ≤10kΩ | 70 | 90 | - | dB |
| Supply Voltage Rejection Ratio | SVR | R _S ≤10kΩ | 76.5 | 90 | - | dB |
| Operating Current | I _{CC} | | - | 3.5 | 5.7 | mA |
| Slew Rate | | | | | | |
| NJM4558 | SR | | - | 1 | - | V/μs |
| NJM4559 | SR | | - | 2 | - | V/μs |
| Equivalent Input Noise Voltage (note2) | V _{NI} | RIAA, R _S =2.2kΩ, 30kHz LPF | - | 1.4 | - | μVrms |
| Gain Bandwidth Product | GB | | | | | |
| NJM4558 | | | | 3 | | MHz |
| NJM4559 | | | | 6 | | MHz |

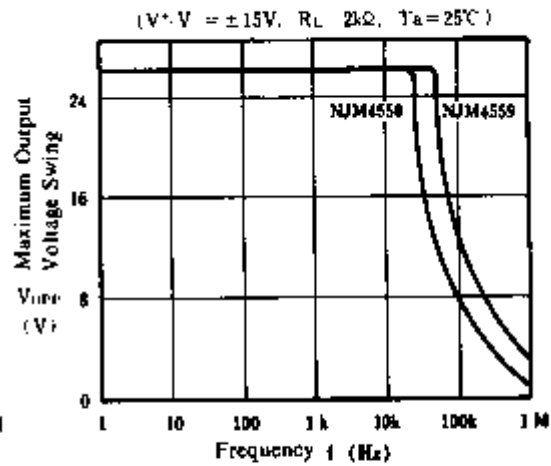
(note2) In regard to Noise Standard, NJRC is preparing for special D Rank type products (V_{NI}=1.8μV max.) except for SSOP package.

■ TYPICAL CHARACTERISTICS

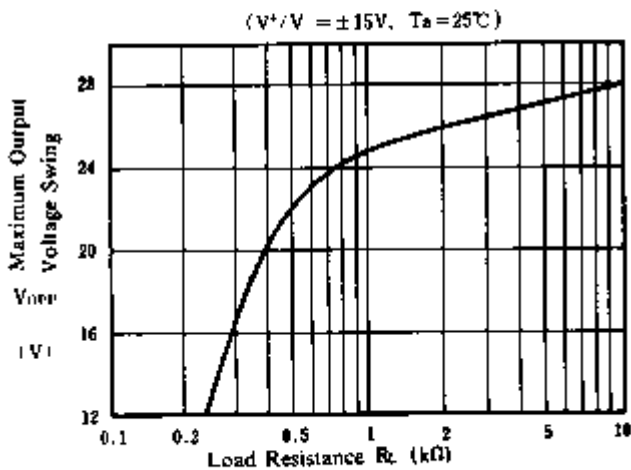
Open Loop Voltage Gain vs. Frequency



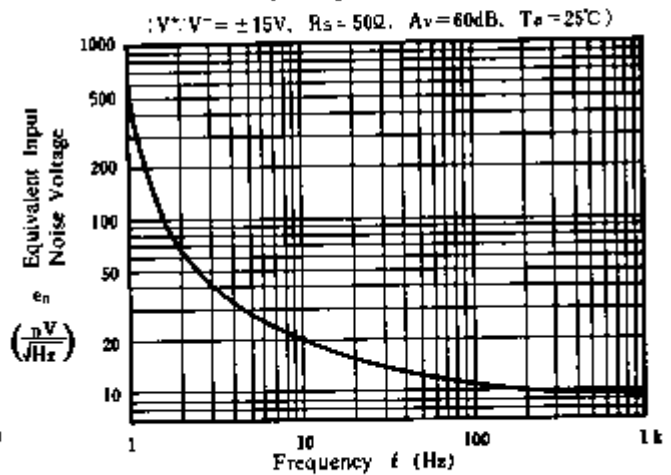
Maximum Output Voltage Swing vs. Frequency



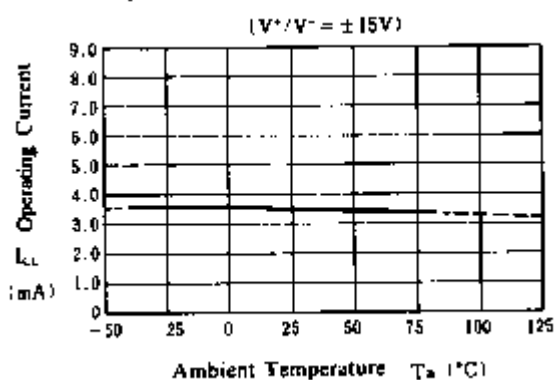
Maximum Output Voltage Swing vs. Load Resistance



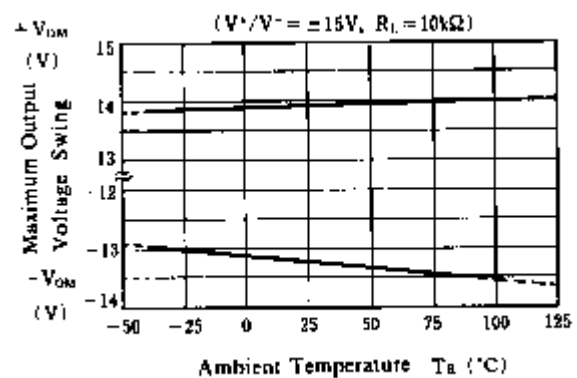
Equivalent Input Noise Voltage vs. Frequency



Operating Current vs. Temperature



Maximum Output Voltage Swing vs. Temperature

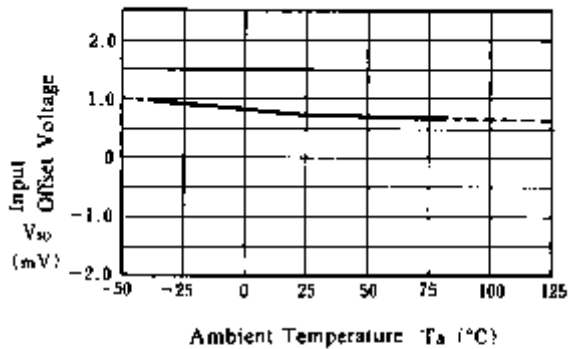


NJM4558/4559

TYPICAL CHARACTERISTICS

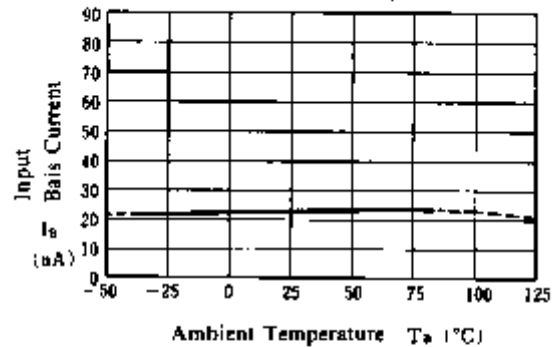
Input Offset Voltage vs. Temperature

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



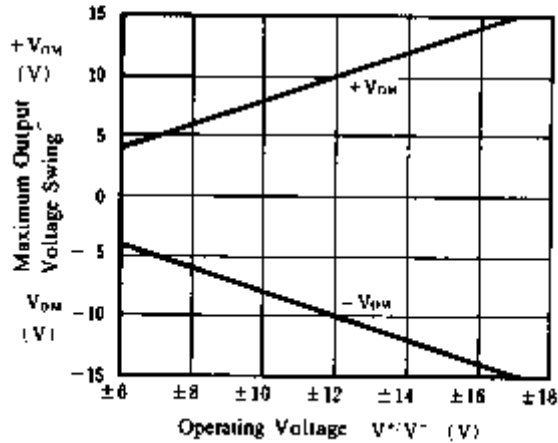
Input Bias Current vs. Temperature

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



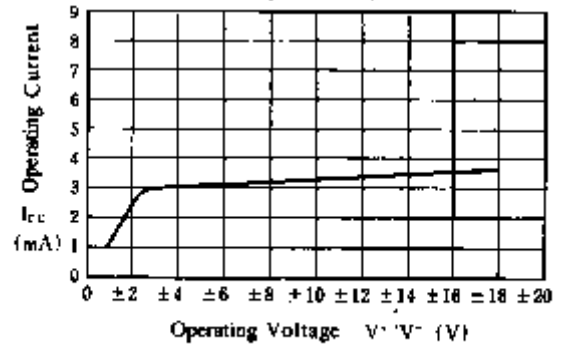
Maximum Output Voltage Swing vs. Operating Voltage

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



Operating Current vs. Operating Voltage

($T_a = 25^\circ C$)



[CAUTION]

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