# LOW-NOISE DUAL OPERATIONAL AMPLIFIER

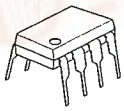
## ■ GENERAL DESCRIPTION

The NJM2041 is a bipolar operational amplifier which is designed as low noise version of the NJM4558 with high output current and fast slew rate (3V/ $\mu$s) and wide unity gain bandwidth (7MHz) constructed using New JRC Planar epitaxial process.

## ■ FEATURES

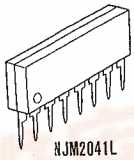
- Operating Voltage (±4V～±22V)
- High Onput Current (25mA.)
- Slew Rate (3V/ $\mu$s typ.)
- Unity Gain Bandwidth (7MHz typ.)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

## ■ PACKAGE OUTLINE



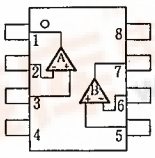
NJM2041D

NJM2041M

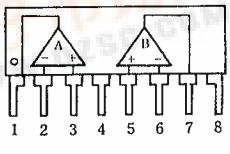


NJM2041L

## ■ PIN CONFIGURATION



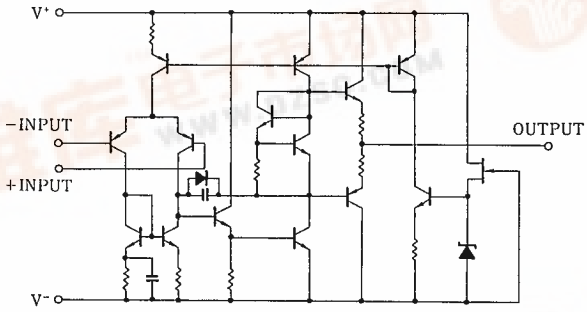

NJM2041D
NJM2041M




NJM2041L

PIN FUNCITON
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)



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Supply Voltage | $V^+/V^-$ | ±22 | V |
| Differential Input Voltage | $V_{ID}$ | ±30 | V |
| Input Voltage | $V_{IC}$ | ±15 (note) | V |
| Power Dissipation | $P_D$ | (DIP8) 500 | mW |
| | | (DIM8) 300 | mW |
| | | (SIP8) 800 | mW |
| Operating Temperature Range | $T_{opr}$ | −20～+75 | ℃ |
| Storage Temperature Range | $T_{stg}$ | −40～+125 | ℃ |

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

## ■ ELECTRICAL CHARACTERISTICS

(Ta =25℃, $V^+/V^-$=±15V)

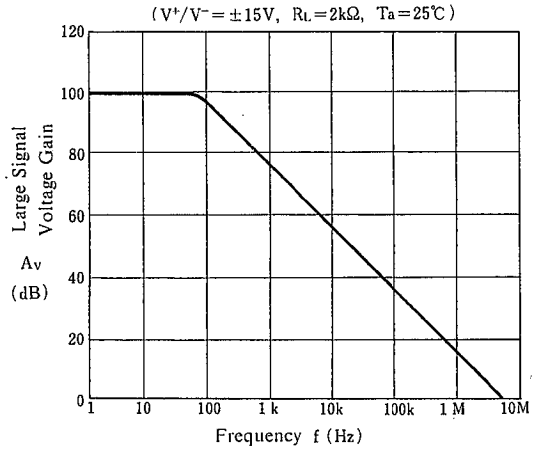
| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Input Offset Voltage | $V_{IO}$ | $R_S$≦10kΩ | — | 0.3 | 3 | mV |
| Input Offset Current | $I_{IO}$ | | — | 10 | 200 | nA |
| Input Bias Current | $I_B$ | | — | 200 | 500 | nA |
| Input Resistance | $R_{IN}$ | | 50 | 200 | — | kΩ |
| Large signal Voltage Gain | $A_V$ | $R_L$≧2kΩ, $V_O$=±10V | 86 | 110 | — | dB |
| Maximum Output Voltage Swing 1 | $V_{OM1}$ | $R_L$≧10kΩ | ±12 | ±14 | — | V |
| Maximum Output Voltage Swing 2 | $V_{OM2}$ | $I_O$=25mA | ±10 | ±11.5 | — | V |
| Input Common Mode Voltage Range | $V_{ICM}$ | | ±12 | ±14 | — | V |
| Common Mode Rejection Ratio | CMR | $R_S$≦10kΩ | 70 | 100 | — | dB |
| Supply Voltage Rejection Ratio | SVR | $R_S$≦10kΩ | 76 | 100 | — | dB |
| Operating Current | $I_{CC}$ | | — | 6 | 8 | mA |
| Slew Rate | SR | | — | 3 | — | V/μs |
| Gain Bandwidth Product | GB | | — | 7 | — | MHz |
| Equivalent Input Noise Voltage | $V_{NI}$ | FLAT+JISA $R_S$=300Ω | — | 0.48 | 0.61 | μVrms |

(note) New JRC's general selected products D-rank are also prepared for the noise standard (Rs=2.2kΩ,RIAA, $V_{NI}$=1.4μV Max.)

## ■ TYPICAL CHARACTERISTICS

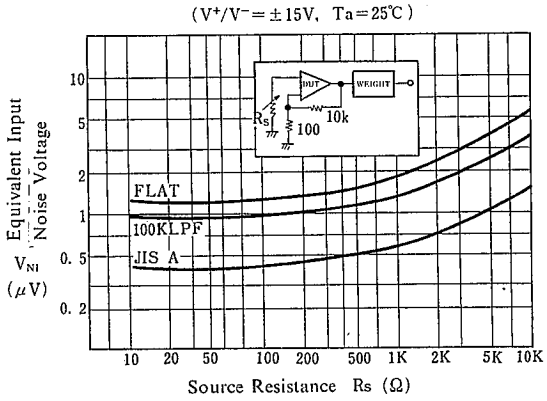
### Lange Signal Voltage Gain vs. Frequency

($V^+/V^-=\pm15V$, $R_L=2k\Omega$, $Ta=25℃$)



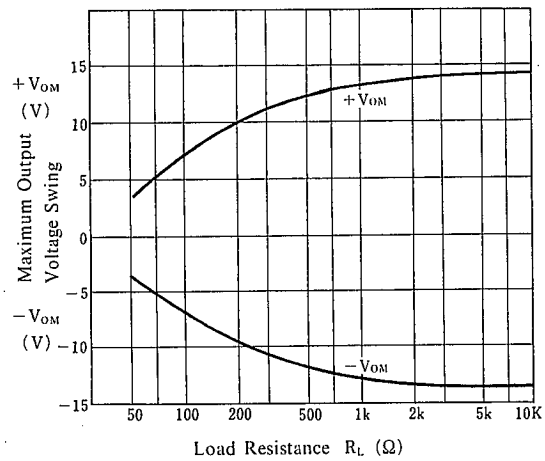

### Equivalent Input Noise Voltage

($V^+/V^-=\pm15V$, $Ta=25℃$)



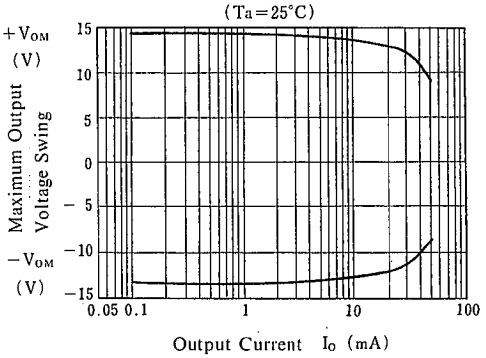

### Maximum Output Voltage Swing vs. Load Resistance

($V^+/V^-=\pm15V$, $Ta=25℃$)



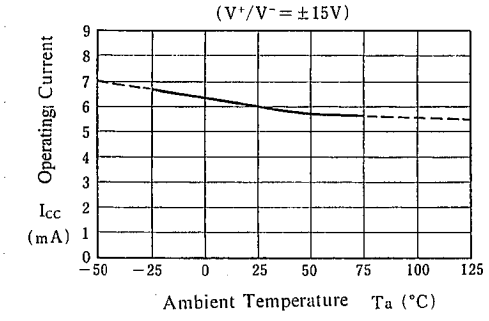

### Maximum Output Voltage Swing vs. Output Current

($Ta=25°C$)



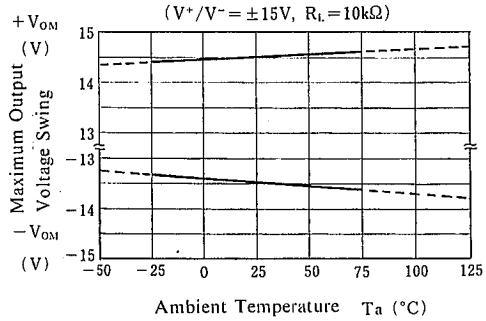

### Operating Current vs. Temperature

($V^+/V^-=\pm15V$)



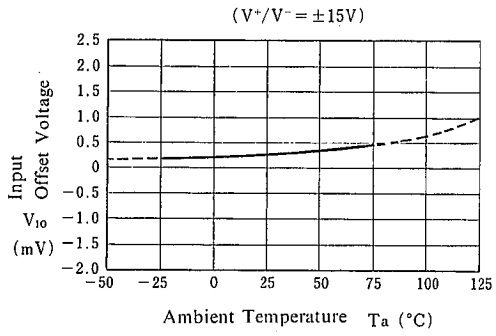

### Maximum Output Voltage Swing vs. Temperature

($V^+/V^-=\pm15V$, $R_L=10k\Omega$)

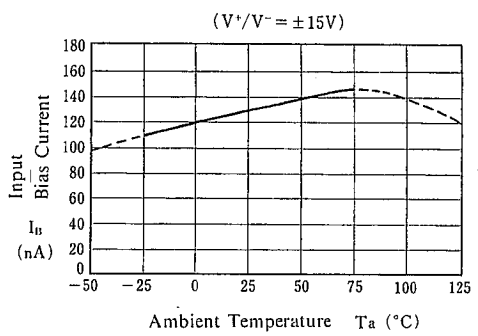


## ■ TYPICAL CHARACTERISTICS

### Input Offset Voltage vs. Temperature




### Input Bias Current vs. Temperature

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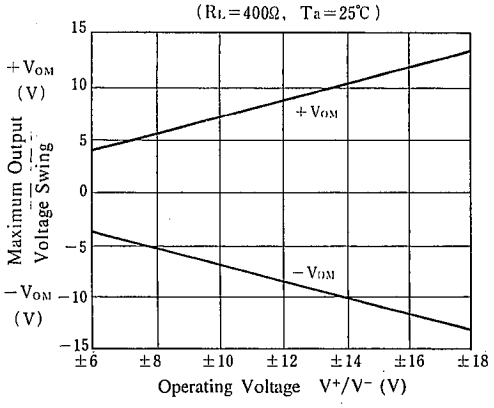
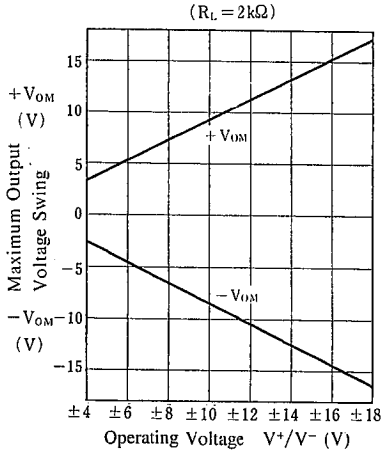
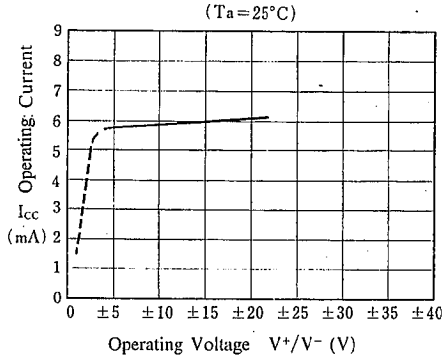
### Mixiumum Output Voltage Swing vs. Operating Voltage



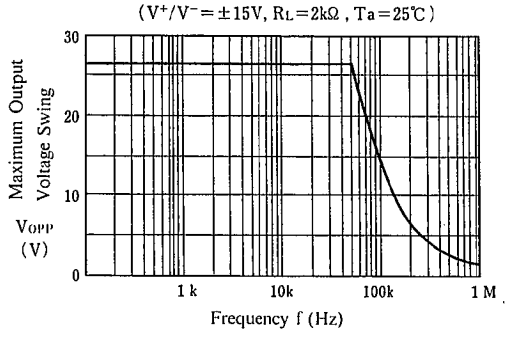

### Mixiumum Output Voltage Swing vs. Operating Voltage




### Operating Current vs. Operating Voltage




### Maximum Output Voltage Swing vs. Frequency



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