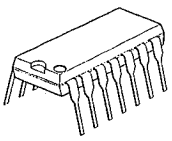
# QUAD OPERATIONAL AMPLIFIER

## ■ GENERAL DESCRIPTION

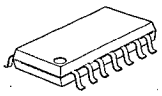
The NJM2058 integrated circuit is a quad high-gain operational amplifier internally compensated and constructed on a single silicon chip using an advanced epitaxial process.

Each amplifier of the NJM2058 has the same electrical characteristics of the NJM4558.

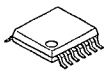
## ■ PACKAGE OUTLINE



NJM2058D



NJM2058M

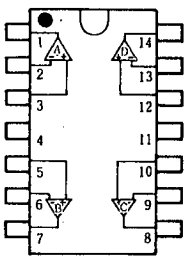


NJM2058V

## ■ FEATURES

- Operating Voltage (±4V～±18V)
- Package Outline DIP14, DMP14, SSOP14
- Bipolar Technology

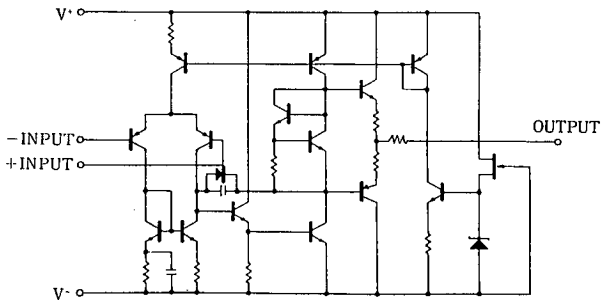
## ■ PIN CONFIGURATION




NJM2058D
NJM2058M
NJM2058V

PIN FUNCITON
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. $V^+$
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. C OUTPUT
9. C−INPUT
10. C+INPUT
11. $V^-$
12. D+INPUT
13. D−INPUT
14. D OUTPUT

## ■ EQUIVALENT CIRCUIT (1/4 Shown)



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

| PARAMETER | SYMBOL | RATINGS | | UNIT |
|---|---|---|---|---|
| Supply Voltage | $V^+/V^-$ | ±18 | | V |
| Differential Input Voltage | $V_{ID}$ | ±30 | | V |
| Input Voltage | $V_{IC}$ | ±15 | (note 1) | V |
| Power Dissipation | $P_D$ | (DIP14) 700 | | mW |
| | | (DIM14) 700 | (note 2) | mW |
| | | (SSOP14) 300 | | mW |
| Operating Temperature Range | $T_{opr}$ | −40~+85 | | ℃ |
| Storage Temperature Range | $T_{stg}$ | −40~+125 | | ℃ |

(note 1) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
(note 2) At on PC board

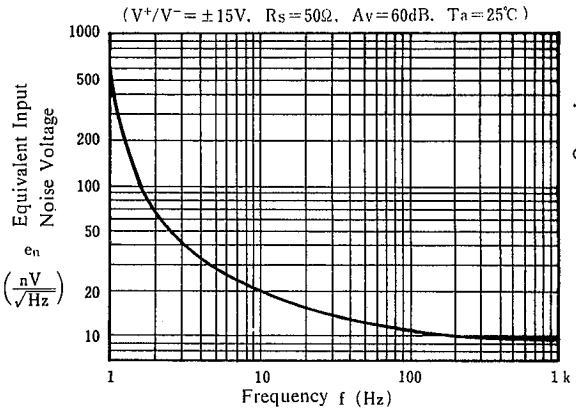
## ■ ELECTRICAL CHARACTERISTICS

($Ta=25℃$, $V^+/V^-=±15V$)

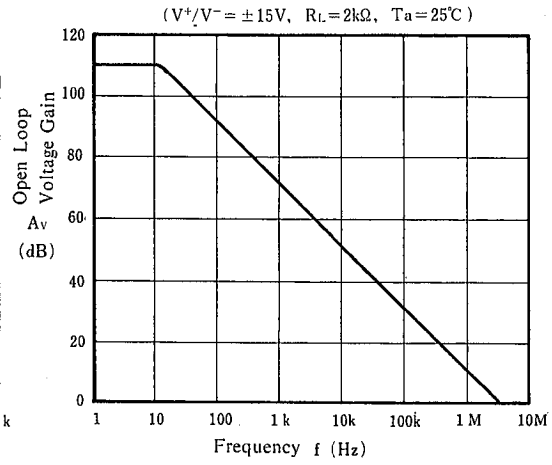
| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Input Offset Voltage | $V_{IO}$ | $R_S≦10kΩ$ | — | 0.5 | 6 | mV |
| Input Offset Current | $I_{IO}$ | | — | 5 | 200 | nA |
| Input Bias Current | $I_B$ | | — | 20 | 500 | nA |
| Input Resistance | $R_{IN}$ | | 0.3 | 1 | — | 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 | $I_{CC}$ | | — | 7 | 11.3 | mA |
| Slew Rate | SR | | — | 1 | — | V/μs |
| Equivalent Input Noise Voltage | $V_{NI}$ | RIAA, $R_S=2.2kΩ$, 30kHz LPF | — | 1.4 | — | μVrms |

## ■ TYPICAL CHARACTERISTICS

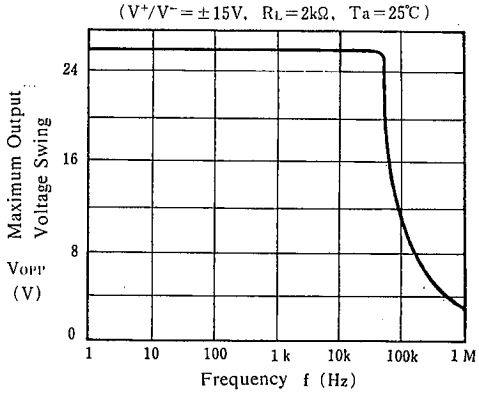
### Equivalent Input Noise Voltage vs. Frequency



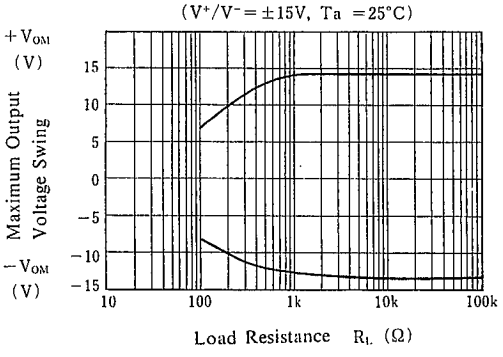

### Open Loop Voltage Gain vs. Frequency



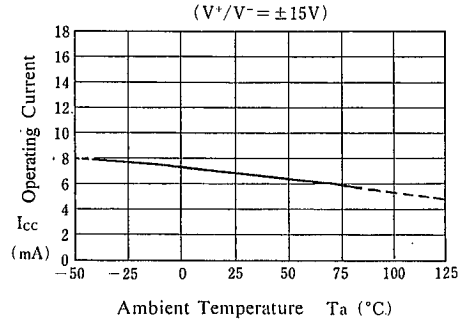

### Maximum Output Voltage Swing vs. Frequency



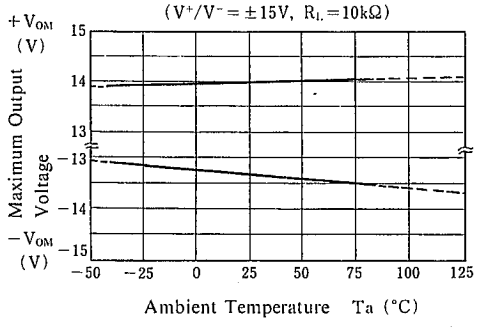

### Maximum Output Voltage Swing vs. Load Resistance




### Operating Current vs. Temperature

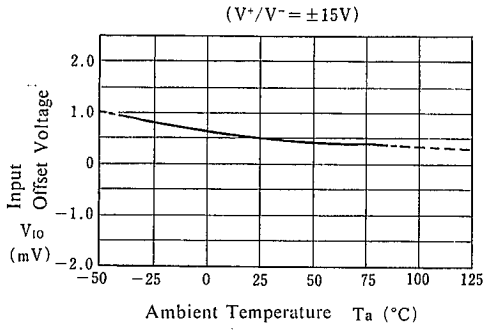



### Maximum Output Voltage Swing vs. Tempertature

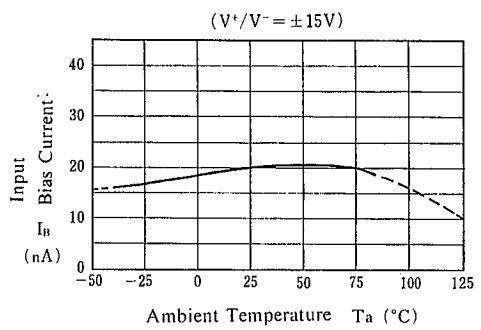


## ■ TYPICAL CHARACTERISTICS

### Input Offset Voltage vs. Temperature




### Input Bias Current vs. Temperature

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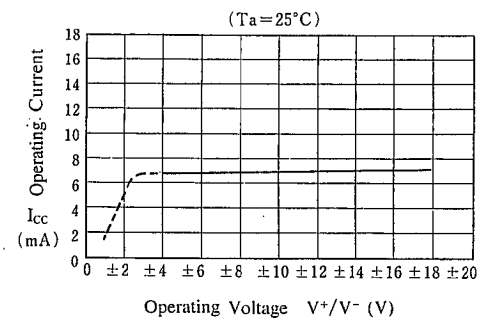
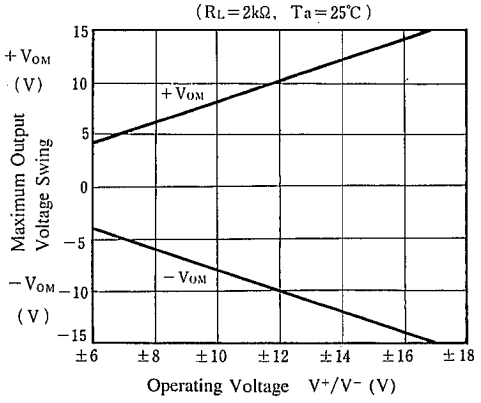
### Operating Current vs. Operating Voltage



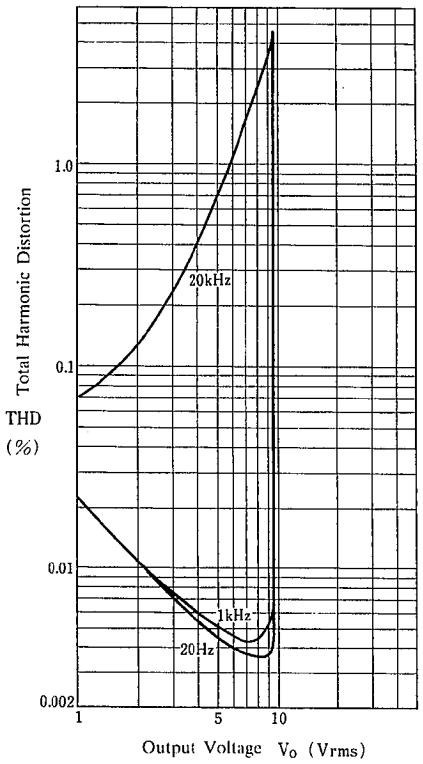

### Maximum Output Voltage Swing vs. Operating Voltage



## ■ TYPICAL CHARACTERISTICS

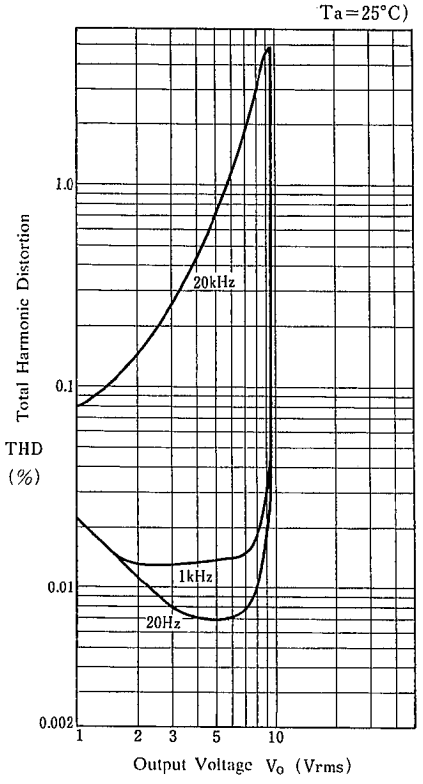
**Total Harmonic Distortion**

($V^+/V^-=\pm15V$, Gain=40dB, $R_L=10k\Omega$, Ta=25°C)




**Total Harmonic Distortion**

($V^+/V^-=\pm15V$, Gain=40dB, $R_L=2k\Omega$, Ta=25°C)



MEMO