

## DUAL OPERATIONAL AMPLIFIER

### ■ GENERAL DESCRIPTION

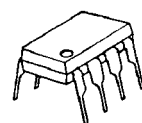
The NJM14558 is dual operational amplifier, which can operate from  $\pm 2V$  supply. The features are low offset voltage, low bias current and low current consumption.

The package lineup is DIP, DMP and others, so that the NJM14558 is suitable for portable audio and any kind of signal amplifier.

### ■ FEATURES

- Operating Voltage (  $\pm 2.0V \sim \pm 7.0V$  )
- Input Offset Voltage ( 3mV max. )
- Slew Rate (  $2.5V/\mu s$  typ. )
- Bipolar Technology
- Package Outline DIP8, DMP8, EMP8, SSOP8, VSP8, SIP8

### ■ PACKAGE OUTLINE



NJM14558D



NJM14558M



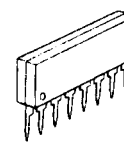
NJM14558E



NJM14558V

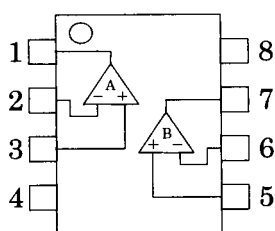


NJM14558R

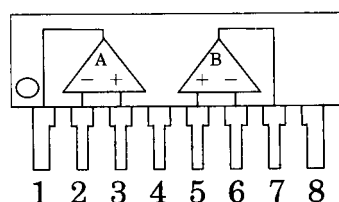


NJM14558L

### ■ PIN CONFIGURATION



NJM14558/14558M/14558E  
NJM14558V/14558R

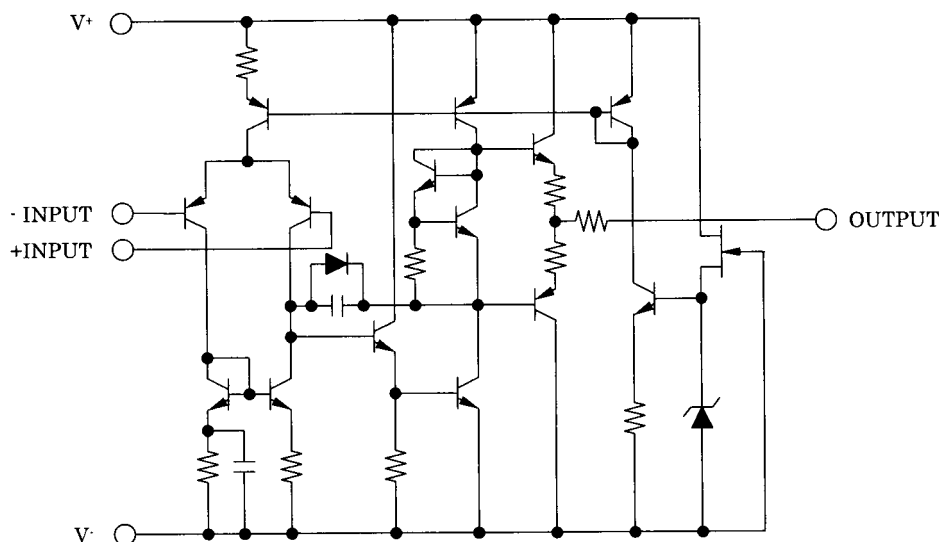


NJM14558L

### 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 )



# NJM14558

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

| PARAMETER                   | SYMBOL    | RATINGS                                                                                       | UNIT |
|-----------------------------|-----------|-----------------------------------------------------------------------------------------------|------|
| Supply Voltage              | $V^+/V^-$ | $\pm 7.5$                                                                                     | V    |
| Differential Input Voltage  | $V_{ID}$  | $\pm 14$                                                                                      | V    |
| Input Voltage               | $V_{IC}$  | $\pm 7$ ( note )                                                                              | V    |
| Power Dissipation           | $P_D$     | ( DIP8 ) 500<br>( DMP8 ) 300<br>( EMP8 ) 300<br>( SSOP8 ) 250<br>( VSP8 ) 320<br>( SIP8 ) 800 | mW   |
| Operating Temperature Range | $T_{opr}$ | -40~+85                                                                                       | °C   |
| Storage Temperature Range   | $T_{stg}$ | -40~+125                                                                                      | °C   |

( note ) For supply voltage less than  $\pm 7V$ , the absolute maximum input voltage is equal to the supply voltage.

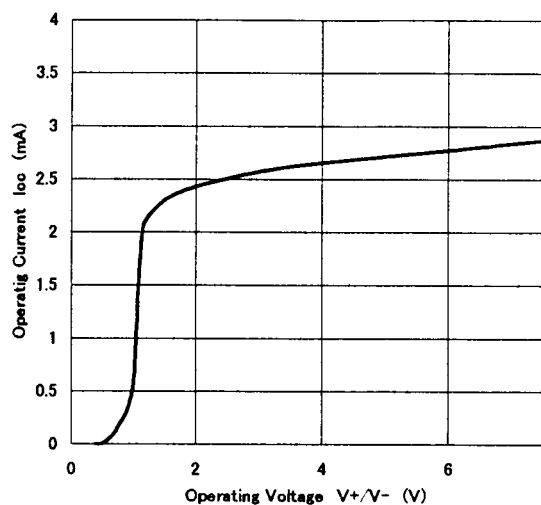
## ■ ELECTRICAL CHARACTERISTICS

(  $V^+/V^- = \pm 5V$ , Ta=25°C )

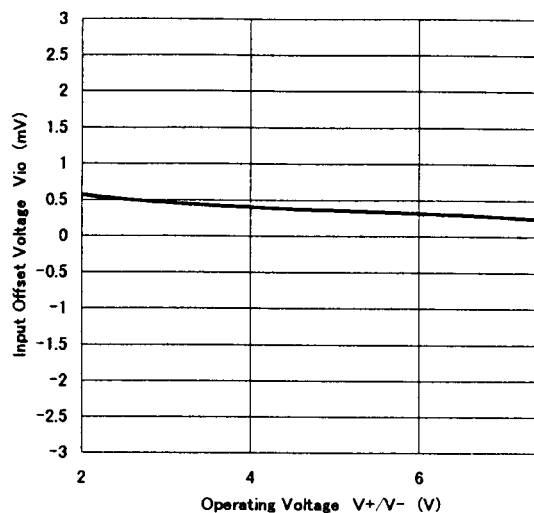
| PARAMETER                          | SYMBOL     | TEST CONDITION                       | MIN.      | TYP.      | MAX.    | UNIT  |
|------------------------------------|------------|--------------------------------------|-----------|-----------|---------|-------|
| Operating Voltage                  | $V_{opr}$  |                                      | $\pm 2$   | -         | $\pm 7$ | V     |
| Input Offset Voltage               | $V_{IO}$   | $R_S \leq 10k\Omega$                 | -         | 0.5       | 3       | mV    |
| Input Offset Current               | $I_{IO}$   |                                      | -         | 5         | 50      | nA    |
| Input Bias Current                 | $I_B$      |                                      | -         | 70        | 250     | nA    |
| Input Resistance                   | $R_{IN}$   |                                      | 0.3       | 5         | -       | MΩ    |
| Large Signal Voltage Gain          | $A_V$      | $R_L \geq 2k\Omega, V_O = \pm 3V$    | 86        | 100       | -       | dB    |
| Maximum Output Voltage Swing ( + ) | $V_{OM}^+$ | $R_L \geq 2k\Omega$                  | 3.5       | 4.0       | -       | V     |
| Maximum Output Voltage Swing ( - ) | $V_{OM}^-$ | $R_L \geq 2k\Omega$                  | -         | -3.5      | -3.0    | V     |
| Input Common Mode Voltage Range    | $V_{ICM}$  |                                      | $\pm 3.0$ | $\pm 4.0$ | -       | 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    |
| Operating Current                  | $I_{CC}$   |                                      | -         | 2.7       | 4.5     | mA    |
| Slew Rate                          | SR         |                                      | -         | 2.5       | -       | V/μs  |
| Equivalent Input Noise Voltage     | $V_{NI}$   | RIAA, $R_S = 2.2k\Omega$ , 30kHz:LPF | -         | 1.4       | -       | μVrms |
| Gain Bandwidth Product             | GB         |                                      | -         | 5         | -       | MHz   |

## ■ TYPICAL CHARACTERISTICS

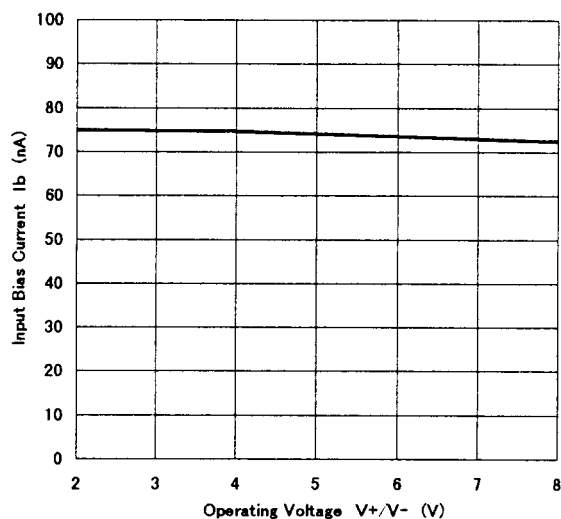
NJM14558 Operating Current vs. Operating Voltage



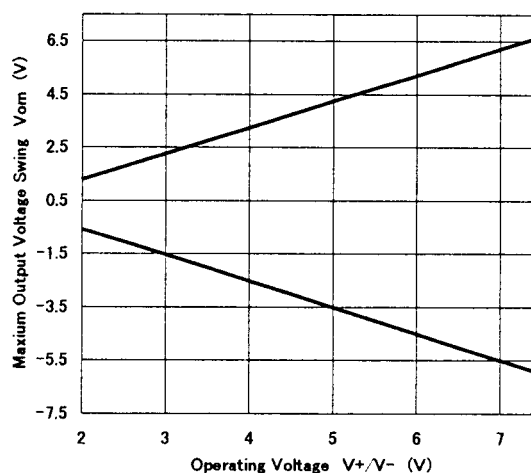
NJM14558 Input Offset Voltage vs. Operating Voltage



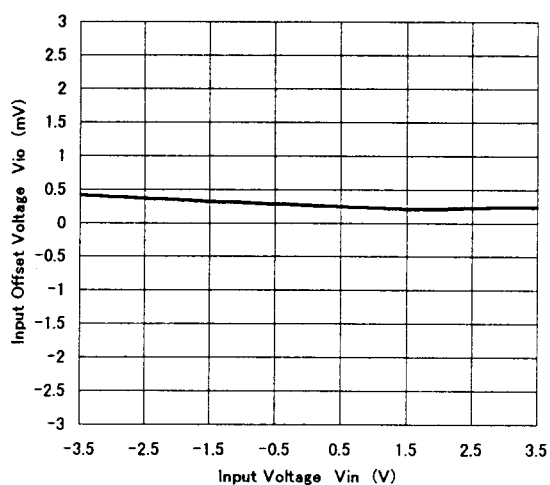
NJM14558 Input Bias Current vs. Operating Voltage



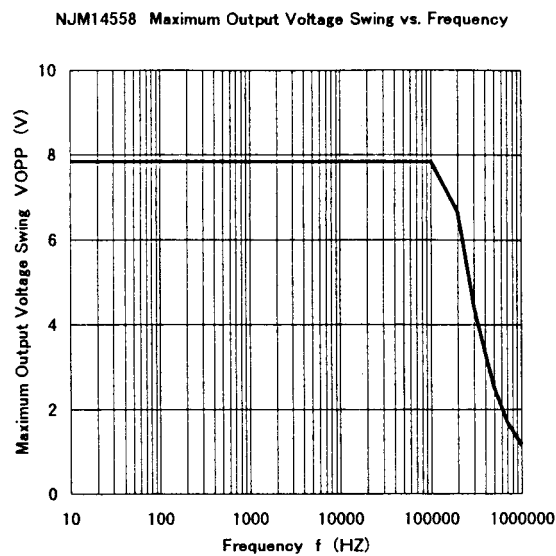
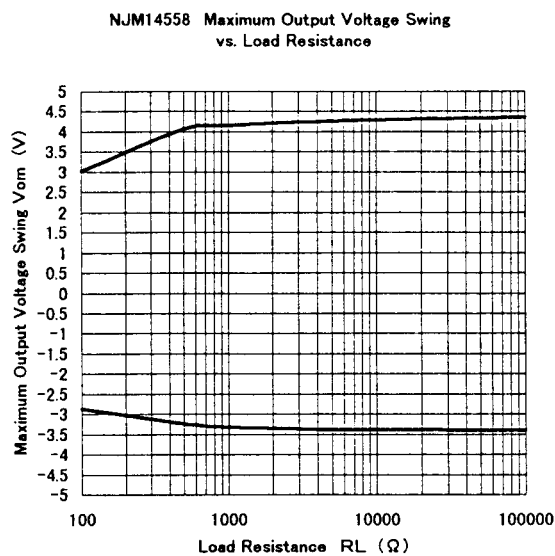
NJM14558 Maximum Output Voltage Swing vs. Operating Voltage



NJM14558 Input Common Mode Voltage Range

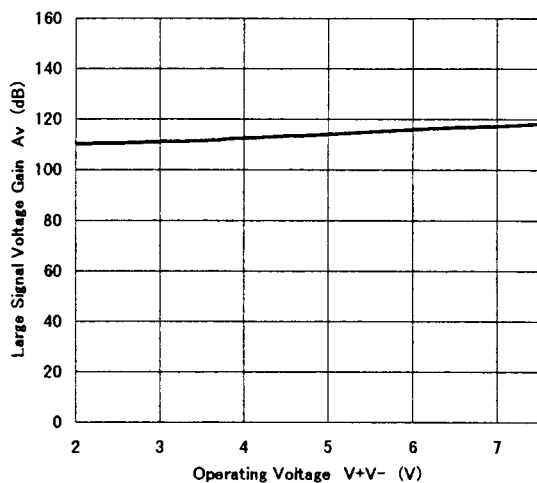


## ■ TYPICAL CHARACTERISTICS

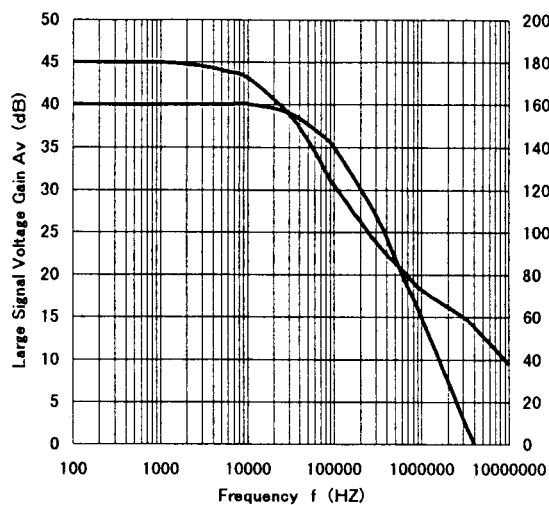


## ■ TYPICAL CHARACTERISTICS

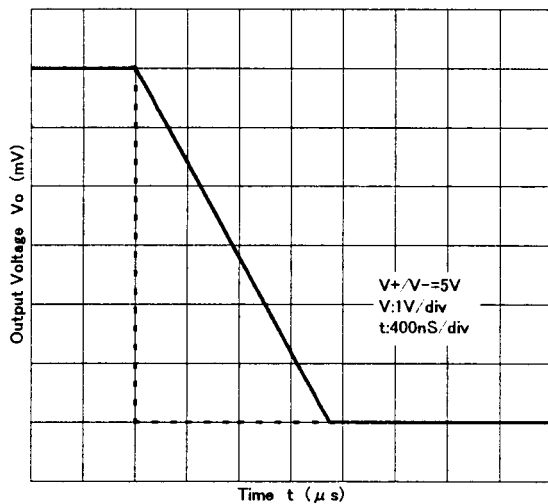
NJM14558 Large Signal Voltage Gain vs. Operating Voltage



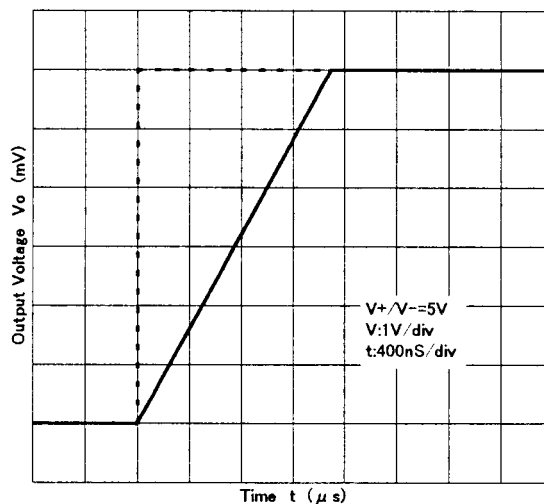
NJM14558 Large Signal Voltage Gain vs. Frequency



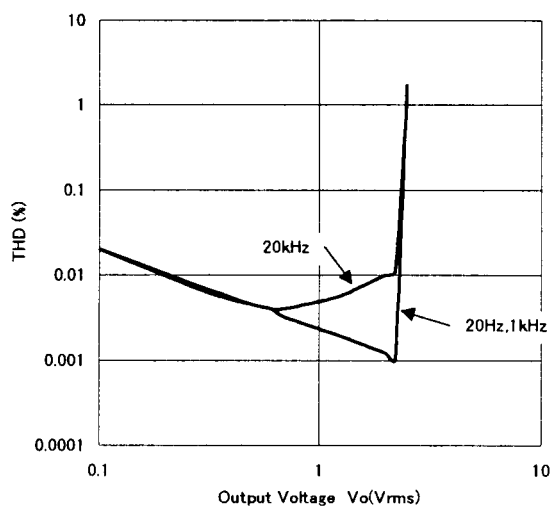
NJM14558 Slew Rate(Fall)



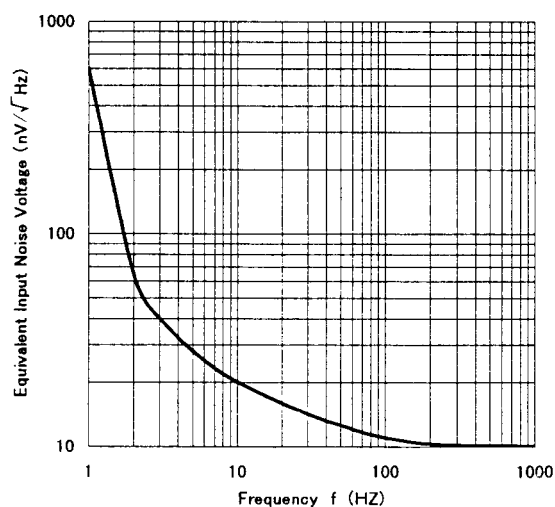
NJM14558 Slew Rate(Rise)



NJM14558 THD vs. Output Voltage

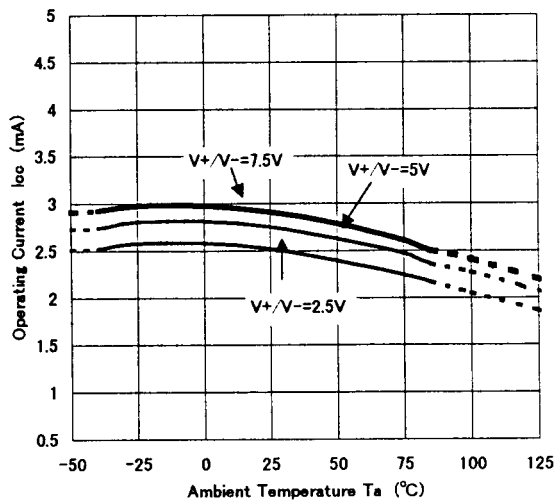


NJM14558 Equivalent Input Noise Voltage vs. Frequency

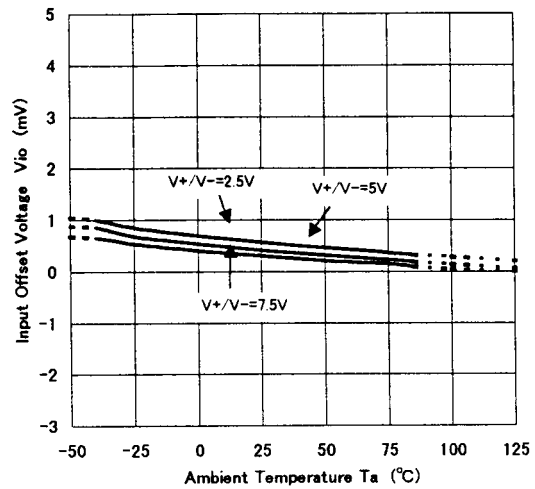


## ■ TYPICAL CHARACTERISTICS

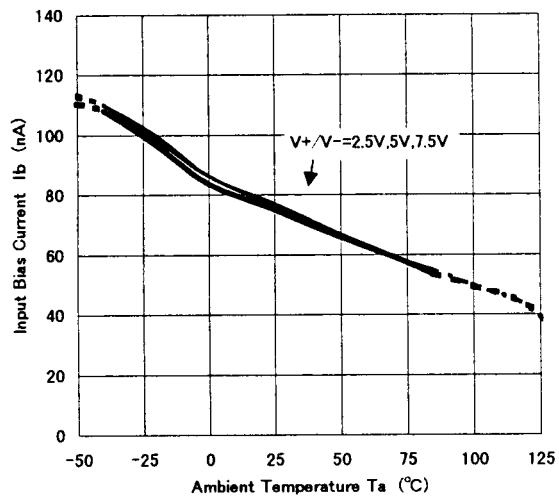
NJM14558 Operating Current vs. Temperature



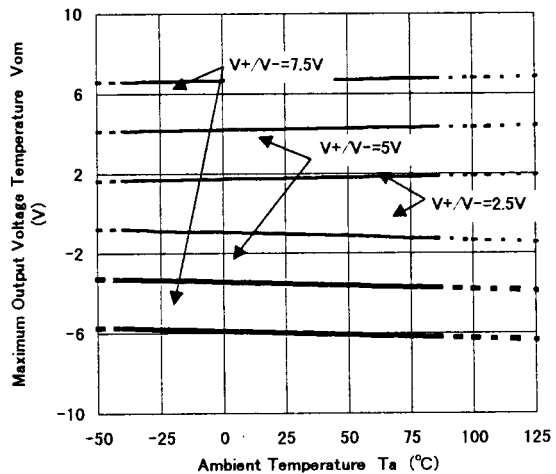
NJM14558 Input Offset Voltage vs. Temperature



NJM14558 Input Bias Current vs. Temperature

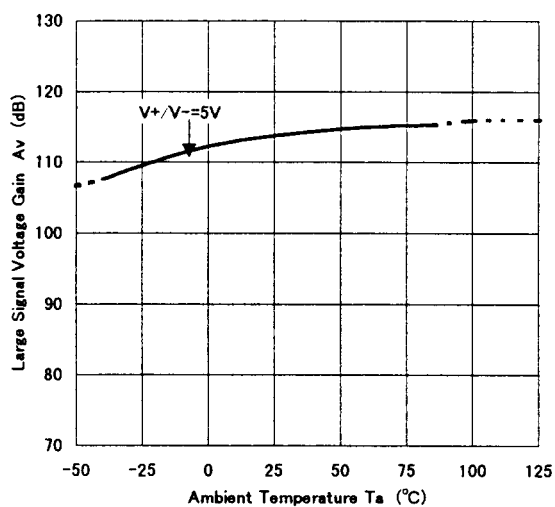


NJM14558 Maximum Output Voltage Swing vs. Temperature

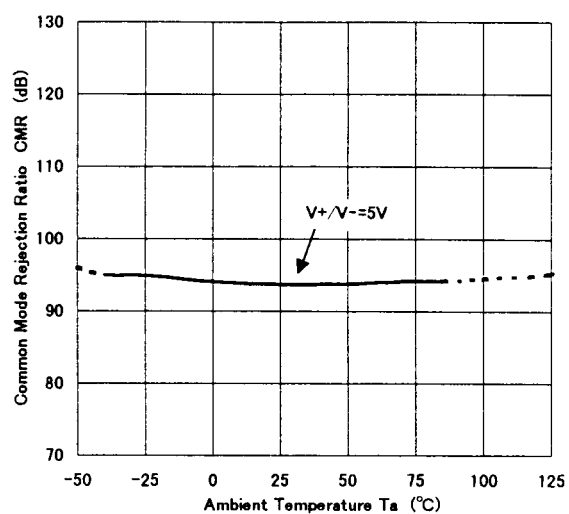


## ■ TYPICAL CHARACTERISTICS

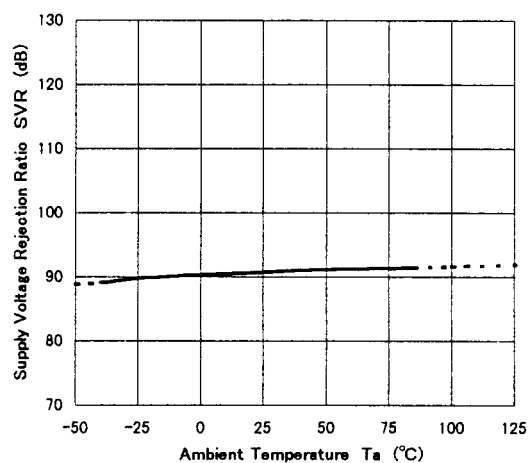
NJM14558 Large Signal Voltage Gain vs. Temperature



NJM14558 Common Mode Rejection Ratio vs. Temperature



NJM14558 Supply Voltage Rejection Ratio vs. Temperature



**[CAUTION]**

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.