

# AN6550

## Dual Operational Amplifier

### Overview

The AN6550 is a dual operational amplifier with a phase compensation circuit built-in, allowing low voltage operation.

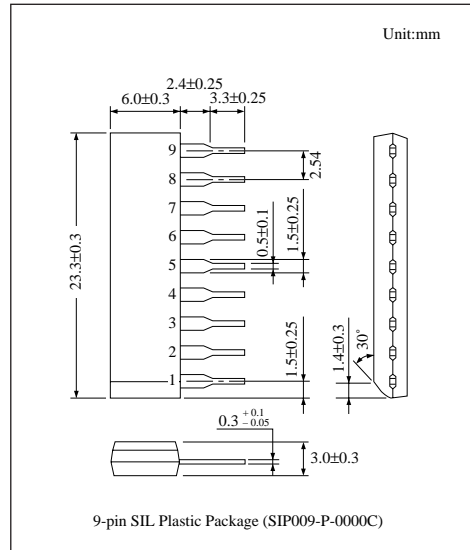
It is suitable for application to various electronic circuits such as active filters and audio preamplifiers.

### Features

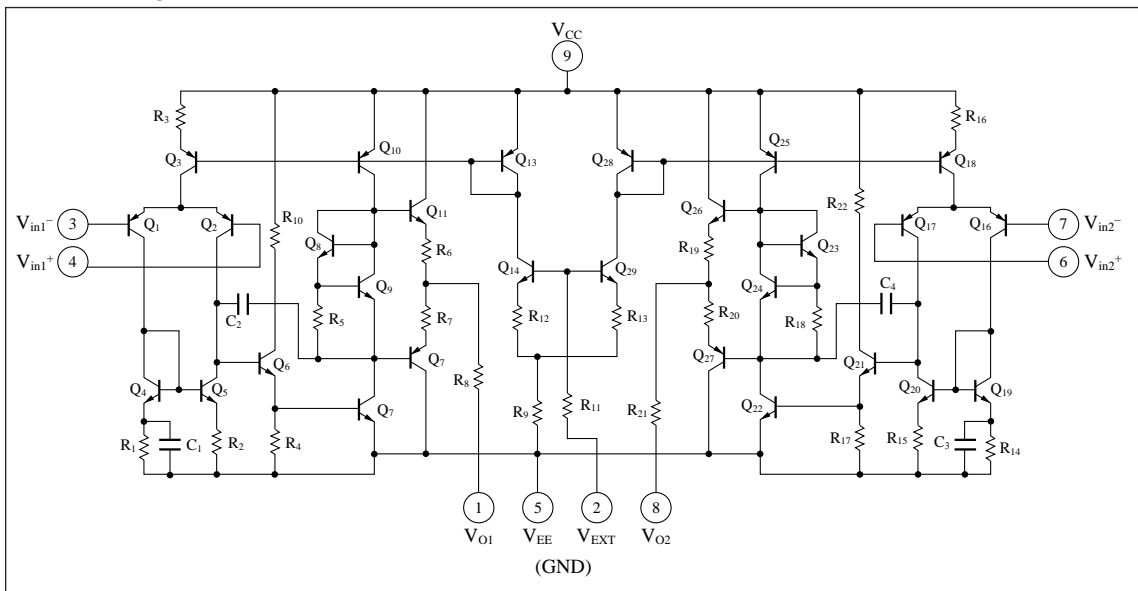
- Phase compensation circuit
- High voltage gain, low noise
- Output short protection circuit
- Low voltage operation( $\pm 2.5V$  to  $\pm 10V$ )

### Pin Descriptions

| Pin No. | Pin name                 |
|---------|--------------------------|
| 1       | Ch.1 output              |
| 2       | External bias            |
| 3       | Ch.1 inverting input     |
| 4       | Ch.1 non inverting input |
| 5       | $V_{EE}$ (GND)           |
| 6       | Ch.2 non inverting input |
| 7       | Ch.2 inverting input     |
| 8       | Ch.2 output              |
| 9       | $V_{CC}$                 |



### Block Diagram



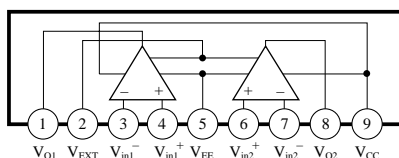
## ■ Absolute Maximum Ratings (Ta=25°C)

| Parameter         |                               | Symbol           | Rating               | Unit |
|-------------------|-------------------------------|------------------|----------------------|------|
| Voltage           | Supply voltage                | $V_{CC}, V_{EE}$ | $\pm 12$             | V    |
|                   | External bias supply voltage  | $V_{EXT}$        | $V_{EE}$ to $V_{CC}$ | V    |
|                   | Differential input voltage    | $V_{ID}$         | $\pm 24$             | V    |
|                   | Common-mode input voltage     | $V_{ICM}$        | $\pm 12$             | V    |
| Power dissipation |                               | $P_D$            | 500                  | mW   |
| Temperature       | Operating ambient temperature | $T_{opr}$        | -20 to +75           | °C   |
|                   | Storage temperature           | $T_{stg}$        | -55 to +150          | °C   |

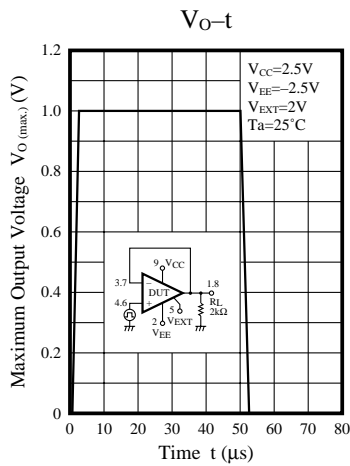
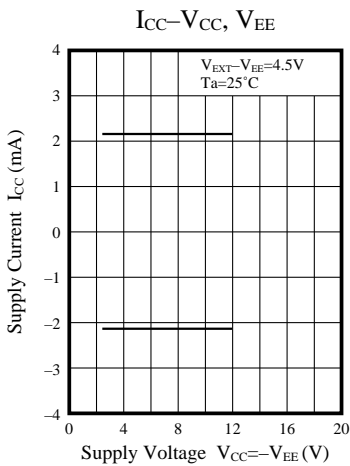
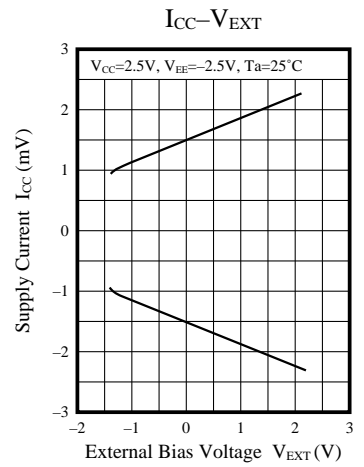
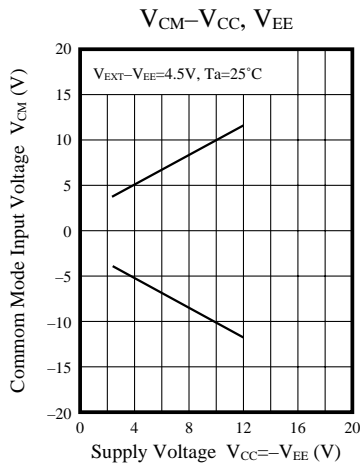
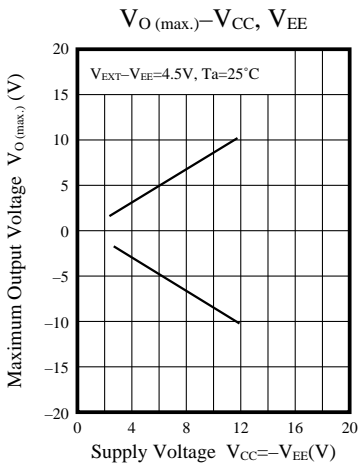
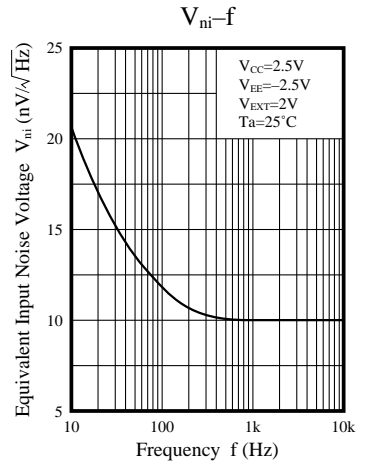
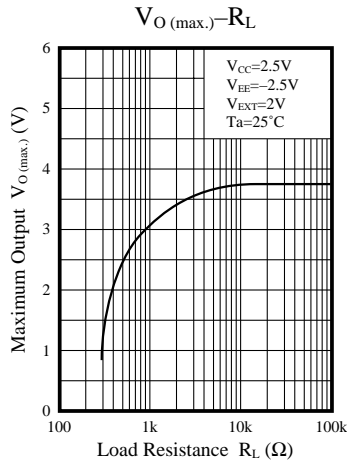
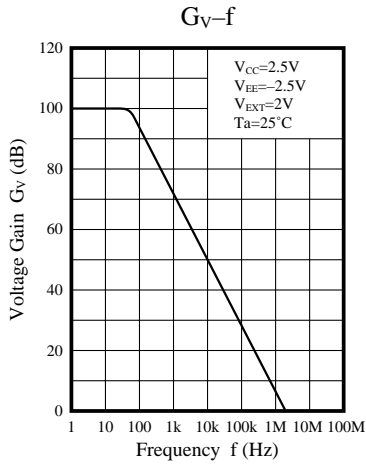
## ■ Electrical Characteristics (V<sub>CC</sub>=2.5V, V<sub>EE</sub>=-2.5V, V<sub>EXT</sub>=2.0V, Ta=25°C)

| Parameter                       | Symbol          | Condition                           | min       | typ       | max | Unit          |
|---------------------------------|-----------------|-------------------------------------|-----------|-----------|-----|---------------|
| Input offset voltage            | $V_{I(offset)}$ | $R_S \leq 10k\Omega$                | —         | 1.5       | 6   | mV            |
| Input offset current            | $I_{IO}$        |                                     | —         | 5         | 200 | nA            |
| Input bias current              | $I_{Bias}$      |                                     | —         | 150       | 500 | nA            |
| Voltage gain                    | $G_V$           | $R_L \geq 2k\Omega$                 | 65        | 100       | —   | dB            |
| Maximum output voltage          | $V_{O(max)}$    | $R_L \geq 10k\Omega$                | $\pm 1.2$ | $\pm 1.7$ | —   | V             |
|                                 |                 | $R_L \geq 2k\Omega$                 | $\pm 1$   | $\pm 1.5$ | —   | V             |
| Common-mode input voltage width | $V_{CM}$        |                                     | $\pm 1$   | $\pm 1.5$ | —   | V             |
| Common-mode rejection ratio     | CMR             |                                     | 70        | 80        | —   | dB            |
| Supply voltage rejection ratio  | SVR             |                                     | —         | 100       | 300 | $\mu V/V$     |
| Power consumption               | $P_C$           | $R_L = \infty$                      | —         | 8         | 15  | mW            |
| Slew rate                       | SR              | $R_L \geq 2k\Omega$                 | —         | 0.8       | —   | V/ $\mu s$    |
| Equivalent input noise voltage  | $V_{ni}$        | $R_S = 1k\Omega, B = 10Hz$ to 30kHz | —         | 2.5       | —   | $\mu V_{rms}$ |

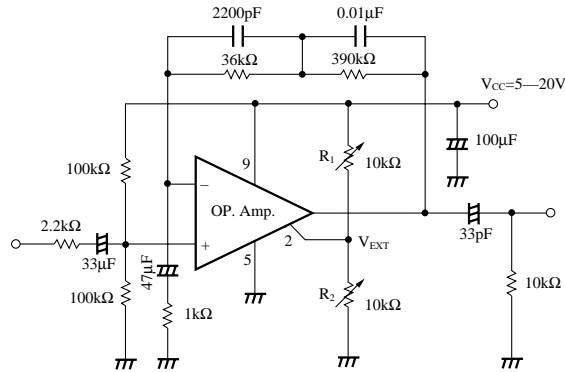
## ■ Pin Assignments



## Characteristics Curve



■ Application Circuit



RIAA Pre-amplifier (single power supply operation)

Note)  $R_1$  and  $R_2$  are resistances for setting operational amplifier bias.

Set  $R_1$  and  $R_2$  so that  $V_{EXT}=2.0V$  to  $6.0V$ .

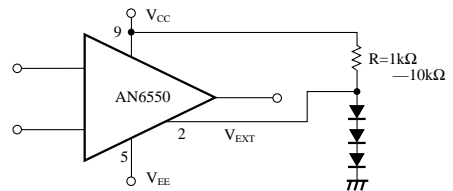
(Recommended Voltage  $V_{EXT}=4.5V$ )

■ How to Apply External to the AN6550

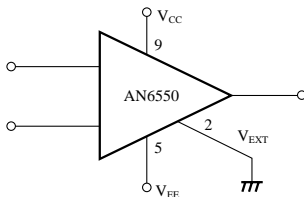
1. The AN6550 is an operational amplifier with a phase compensation circuit built-in, allowing low voltage operation, and its current consumption and bandwidth can be changed by applying external bias to it.
2. As shown below, applies bias voltage to 2  $V_{EXT}$  pin of the AN6550 allows the AN6550 to be handled in the very same way as the AN6551, except for pin connection.

Set  $V_{EXT} \geq V_{EE} + 1V$ .

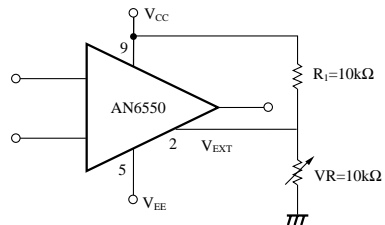
1 ) By diode



2 ) By connecting  $V_{EXT}$  pin to GND



3 ) By dividing with resistors



4 ) By Zener diode

( $V_{CC} - V_{EE} \geq 6V$ )

