

AN4250, AN4250S, AN6593

Single Low Power Consumption Operational Amplifiers

■ Overview

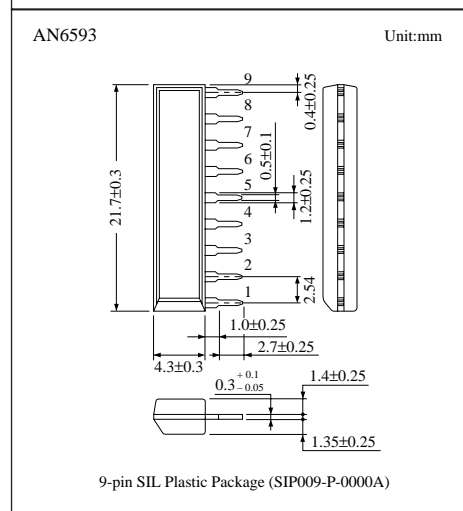
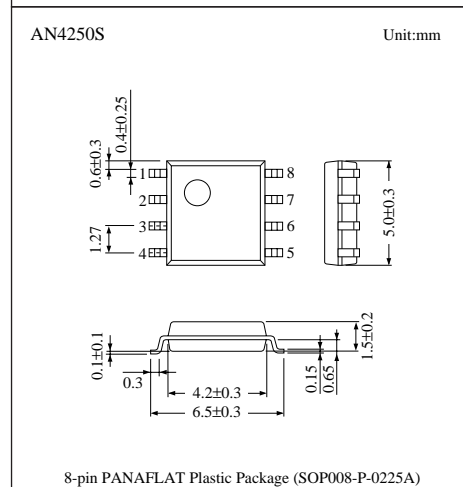
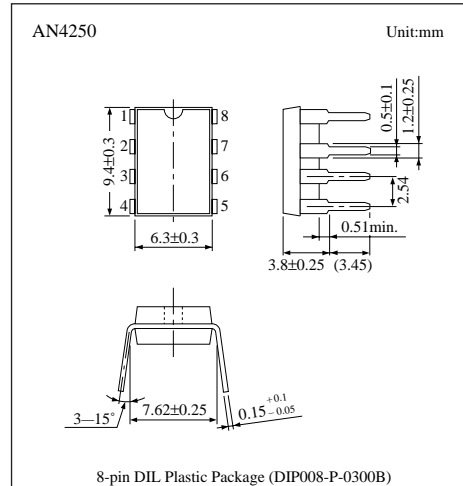
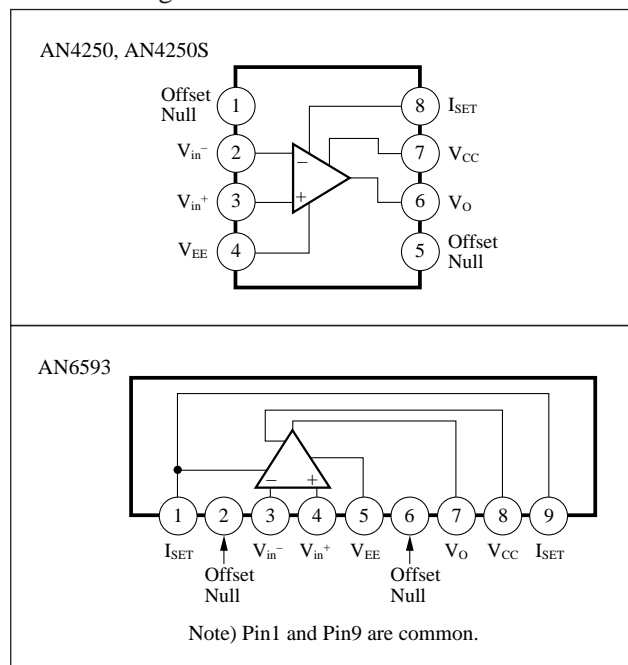
The AN4250, the AN4250S, and the AN6593 are single operational amplifiers which can be operated with very low power consumption. Moreover, they have wide range ($\pm 1V$ to $\pm 18V$) of supply voltage, and electrical characteristics such as power consumption and input bias current can be programmed according to the current value set by outer resistor.

They are suitable for applications to various electronic circuits such as portable electronic equipments operated by the battery.

■ Features

- Wide supply voltage rang ($\pm 1V$ to $\pm 18V$)
- Electrical characteristics programmable by set current
- Phase compensation circuit built in
- Output short-circuit protection
- Offset null

■ Block Diagram



■ Pin Descriptions

〈AN4250, AN4250S〉

| Pin No. | Pin name |
|---------|-----------------------|
| 1 | Offset null |
| 2 | Inverting input |
| 3 | Non inverting input |
| 4 | V _{EE} (GND) |
| 5 | Offset null |
| 6 | Output |
| 7 | V _{CC} |
| 8 | I _{SET} |

〈AN6593〉

| Pin No. | Pin name |
|---------|-----------------------|
| 1 | I _{SET} |
| 2 | Offset null |
| 3 | Inverting input |
| 4 | Non inverting input |
| 5 | V _{EE} (GND) |
| 6 | Offset null |
| 7 | Output |
| 8 | V _{CC} |
| 9 | I _{SET} |

■ Absolute Maximum Ratings (Ta=25°C)

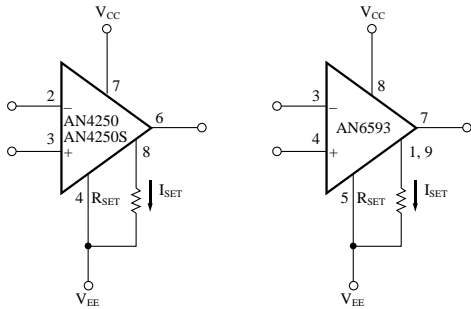
| Parameter | | Symbol | Rating | Unit |
|-------------------------------|----------------------------|------------------|-------------|------|
| Voltage | Supply voltage | V _{CC} | ±18 | V |
| | Differential input voltage | V _{ID} | ±30 | V |
| | Common-mode input voltage | V _{ICM} | ±15 | V |
| Power dissipation | AN4250, AN6593 | P _D | 500 | mW |
| | AN4250S | | 360 | |
| Operating ambient temperature | | T _{opr} | -20 to +75 | °C |
| Storage temperature | AN4250, AN6593 | T _{stg} | -50 to +150 | °C |
| | AN4250S | | -50 to +125 | |

■ Electrical Characteristics (V_{CC}=15V, V_{EE}=-15V, Ta=25°C)

| Parameter | Symbol | Condition | I _{SET} =1μA | | I _{SET} =10μA | | Unit |
|--------------------------------|------------------------|--|-----------------------|-----|------------------------|------|------|
| | | | min | max | min | max | |
| Input offset voltage | V _{I(offset)} | R _S ≤ 100kΩ | — | 5 | — | 6 | mV |
| | | V [±] = ±1.5V, R _S ≤ 100kΩ | — | 5 | — | 6 | |
| Input offset current | I _{IO} | | — | 6 | — | 20 | nA |
| Input bias current | I _{Bias} | | — | 10 | — | 75 | nA |
| | | V [±] = ±1.5V | — | 10 | — | 75 | |
| Large signal voltage gain | G _V | V _O = ±10V, R _L = 100kΩ | 96 | — | — | — | dB |
| | | V _O = ±10V, R _L = 10kΩ | — | — | 96 | — | |
| Supply current | I _{CC} | | — | 11 | — | 100 | μA |
| | | V [±] = ±1.5V | — | 8 | — | 90 | |
| Power consumption | P _C | | — | 330 | — | 3000 | μW |
| | | V [±] = ±1.5V | — | 24 | — | 270 | |
| Input voltage range | V _{CM} | | ±13.5 | — | ±13.5 | — | V |
| | | V [±] = ±1.5V | ±0.6 | — | ±0.6 | — | |
| Maximum output voltage | V _{O(max.)} | R _L = 100kΩ | ±12 | — | — | — | V |
| | | V [±] = ±1.5V, R _L = 100kΩ | ±0.6 | — | — | — | |
| Maximum output voltage | V _{O(max.)} | R _L = 10kΩ | — | — | ±12 | — | V |
| | | V [±] = ±1.5V, R _L = 10kΩ | — | — | ±0.6 | — | |
| Common-mode rejection ratio | CMR | R _S ≤ 10kΩ | 70 | — | 70 | — | dB |
| Supply voltage rejection ratio | SVR | R _S ≤ 10kΩ | 74 | — | 74 | — | dB |

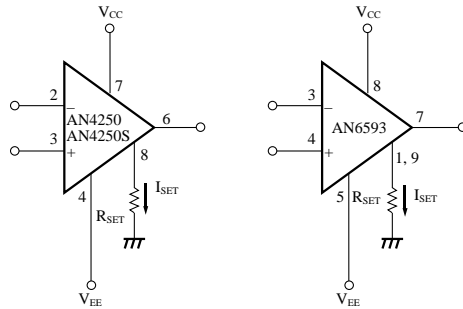
Normal Connection

(a)



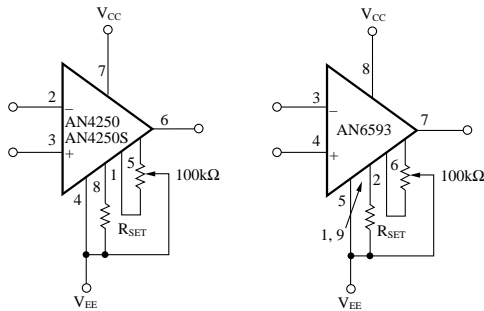
$$I_{SET} \cong \frac{V_{CC} + |V_{EE}| - 0.5}{R_{SET}}$$

(b)



$$I_{SET} \cong \frac{V_{CC} - 0.5}{R_{SET}}$$

Offset Control



Characteristics Curve

