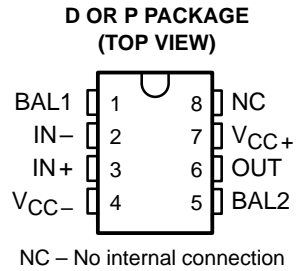


LF351 WIDE-BANDWIDTH JFET-INPUT OPERATIONAL AMPLIFIER

SLOS014B – MARCH 1987 – REVISED AUGUST 1994

- Low Input Bias Current . . . 50 pA Typ
- Low Input Noise Voltage . . . 18 nV/√Hz Typ
- Low Input Noise Current
0.01 pA/√Hz Typ
- Low Supply Current . . . 1.8 mA Typ
- High Input impedance . . . 10¹² Ω Typ
- Low Total Harmonic Distortion
- Internally Trimmed Offset Voltage
10 mV Typ
- High Slew Rate . . . 13 V/μs Typ
- Wide Gain Bandwidth . . . 3 MHz
- Pin Compatible With Standard 741



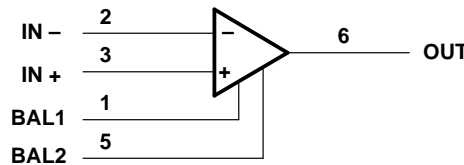
description

This device is a low-cost, high-speed, JFET-input operational amplifier with an internally trimmed input offset voltage. It requires low supply current yet maintains a large gain-bandwidth product and a fast slew rate. In addition, the matched high-voltage JFET input provides very low input bias and offset currents. It uses the same offset voltage adjustment circuits as the 741.

The LF351 can be used in applications such as high-speed integrators, digital-to-analog converters, sample-and-hold circuits, and many other circuits.

The LF351 is characterized for operation from 0°C to 70°C.

symbol (each amplifier)



AVAILABLE OPTIONS

| T _A | V _{IO} max AT 25°C | PACKAGE | |
|----------------|--------------------------------|----------------------|--------------------|
| | | SMALL OUTLINE (D) | PLASTIC DIP (P) |
| 0°C to 70°C | 10 mV | LF351D | LF351P |

The D packages are available taped and reeled. Add the suffix R to the device type (ie., LF351DR).

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

| | |
|--|----------------|
| Supply voltage, V _{CC+} | 18 V |
| Supply voltage, V _{CC-} | -18 V |
| Differential input voltage, V _{ID} | ±30 V |
| Input voltage, V _I (see Note 1) | ±15 V |
| Duration of output short circuit | unlimited |
| Continuous total power dissipation | 500 mW |
| Operating temperature range | 0°C to 70°C |
| Storage temperature range | -65°C to 150°C |
| Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds | 260°C |

NOTE 1: Unless otherwise specified, the absolute maximum negative input voltage is equal to the negative power supply voltage.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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LF351

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recommended operating conditions

| | MIN | MAX | UNIT |
|---------------------------|------|-----|------|
| Supply voltage, V_{CC+} | 3.5 | 18 | V |
| Supply voltage, V_{CC-} | -3.5 | -18 | V |

electrical characteristics over operating free-air temperature range, $V_{CC\pm} = \pm 15$ V (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | T_A^\dagger | MIN | TYP | MAX | UNIT |
|----------------|---|---|---------------|----------|-----------------|-----|------------------------------|
| V_{IO} | Input offset voltage | $V_{IC} = 0$, $R_S = 10\text{ k}\Omega$ | 25°C | 5 | 10 | | mV |
| | | | Full range | | | 13 | |
| α_{VIO} | Average temperature coefficient of input offset voltage | $V_{IC} = 0$, $R_S = 10\text{ k}\Omega$ | | | 10 | | $\mu\text{V}/^\circ\text{C}$ |
| I_{IO} | Input offset current \ddagger | $V_{IC} = 0$ | 25°C | 25 | 100 | | pA |
| | | | 70°C | | | 4 | nA |
| I_{IB} | Input bias current \ddagger | $V_{IC} = 0$ | 25°C | 50 | 200 | | pA |
| | | | 70°C | | | 8 | nA |
| V_{ICR} | Common-mode input voltage range | | | ± 11 | -12 to 15 | | V |
| V_{OM} | Maximum peak output voltage swing | $R_L = 10\text{ k}\Omega$ | | ± 12 | ± 13.5 | | V |
| A_{VD} | Large-signal differential voltage | $V_O = \pm 10\text{ V}$, $R_L = 2\text{ k}\Omega$ | 25°C | 25 | 200 | | V/mV |
| | | | Full range | 15 | 200 | | |
| r_i | Input resistance | $T_J = 25^\circ\text{C}$ | | | 10^{12} | | Ω |
| CMRR | Common-mode rejection ratio | $R_S \leq 10\text{ k}\Omega$ | | 70 | 100 | | dB |
| k_{SVR} | Supply-voltage rejection ratio | See Note 2 | | 70 | 100 | | dB |
| I_{CC} | Supply current | | | | 1.8 | 3.4 | mA |

† Full range is 0°C to 70°C.

\ddagger Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperatures as close to the ambient temperature as possible.

NOTE 2: Supply-voltage rejection ratio is measured for both supply magnitudes increasing or decreasing simultaneously.

operating characteristics, $V_{CC\pm} = \pm 15$ V

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|--------------------------------|--|-----|------|-----|------------------------------|
| SR | Slew rate | | 8 | 13 | | V/ μs |
| B_1 | Unity-gain bandwidth | | | 3 | | MHz |
| V_n | Equivalent input noise voltage | $f = 1\text{ kHz}$, $R_S = 20\ \Omega$ | | 18 | | $\text{nV}/\sqrt{\text{Hz}}$ |
| I_n | Equivalent input noise current | $f = 1\text{ kHz}$ | | 0.01 | | $\text{pA}/\sqrt{\text{Hz}}$ |



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