

LT1997 Configurable Precision Amplifier

DESCRIPTION

Demonstration Circuit 2551A is a Configurable Precision Amplifier featuring the [LT[®]1997](#).

The DC2551A-A supports the LT1997-3 version. The DC2551A-B supports the LT1997-2 version. The DC2551A-C supports the LT1997-1 version.

This demo board provides a rapid evaluation tool with jumpers providing the typical interconnection options that facilitate setting the pin-strapped internal gain configuration. The LT1997 is unusual in that it may be powered from a low voltage (down to 3.3V) while it accepts signals

well outside the supply range. This device also supports particularly high supply voltages, up to 50V. Connection points are provided to wire the amplifier in other configurations besides those possible with the jumpers alone.

The key performance characteristics of the LT1997-3 and DC2551A-A are shown in the Performance Summary below.

[Design files for this circuit board are available.](#)

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PERFORMANCE SUMMARY Specifications are at T_A = 25°C

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------------|--|---------------------------------|----------------------|--------|---------------------|-------|
| V _{+INA} , V _{-INA} | Input Range | Thermally Limited to Short-Term | -160 | | 160 | V |
| Other Inputs | | | -0.3 | | 80 | V |
| V ⁺ , V ⁻ | Amplifier Supply Range (Total If Split Supplies) | | 3.3 | 5...30 | 50 | V |
| V _{OUT} | Output Signal | | V ⁻ +0.35 | | V ⁺ -0.7 | V |
| I _{OUT} | Output Current Range | | ±10 | ±25 | | mA |
| I _S | Supply Current | I _{OUT} = 0 | | 330 | 525 | µA |
| BW | Small Signal -3dB Bandwidth | | 300 | | 1100 | kHz |

OPERATING PRINCIPLES

The LT1997 family op amps include integrated precision resistors for providing many useful high accuracy functions with minimal external components. The default configuration of the demo circuit is a difference amplifier structure with gain set to minimum and the output referenced to mid-supply. Refer to the LT1997 data sheets for tabulations of various practical circuit configurations

that can be implemented, many of which are easily created by jumper relocation on the demo board. Large vias and some spare pads are also provided so that other more specialized configurations can be evaluated, such as AC-coupled gain blocks or summing amplifiers. The demo circuit also provides connector footprints for user-furnished BNC connectors if cable connectivity is desired.

QUICK START PROCEDURE

Demonstration circuit 2551A is easy to set up to evaluate the performance of the LT1997. Refer to Figure 1 for a suitable equipment setup and follow the procedure below:

1. Place jumpers in the following positions:

JP1, JP2 to the **ENable** position

JP6 to the **-IN** position

JP7 to the **+IN** position

JP11-JP13 to the **SPLIT** position as shown (**JP11** and **JP12** should generally be positioned as a set).

JP3-JP5, JP8-JP10 should be removed or connected to just one of their posts.

2. With power off, connect the power supply positive to **+V**, the supply negative to **-V**, and the common to **GND**. The supplies should be preset in the range of $\pm 1.7V$ to $\pm 25V$.

3. Connect a voltmeter or oscilloscope probe to the **OUT** terminal, with the common connection or ground clip tied to **GND**.

4. Connect a signal source to the **+IN** and **-IN**.

NOTE: Generators will typically be referenced to earth ground. An AC 'cheater' plug may be needed if a deliberate offset is to be introduced with another power supply.

5. Turn on the power supplies.

6. Check for an output voltage that is a replica of the input signal processed with the appropriate gain.

QUICK START PROCEDURE

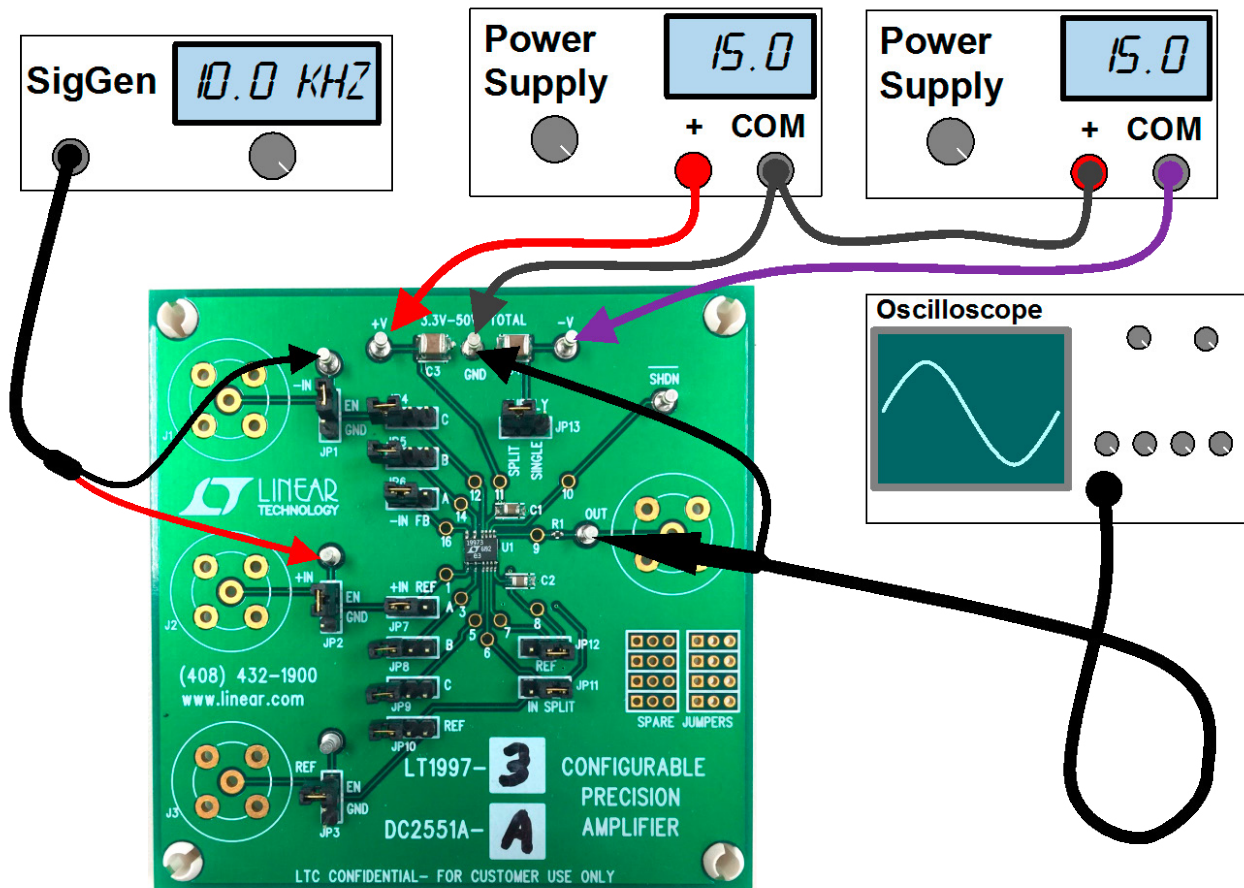


Figure 1. Proper Evaluation Equipment Setup



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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