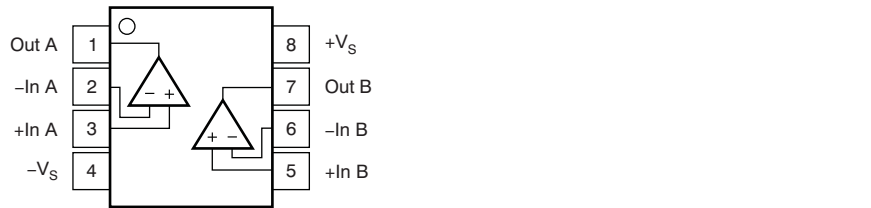


## **DEM-OPA-SOT-2A Demonstration Fixture**

### **1 Description**

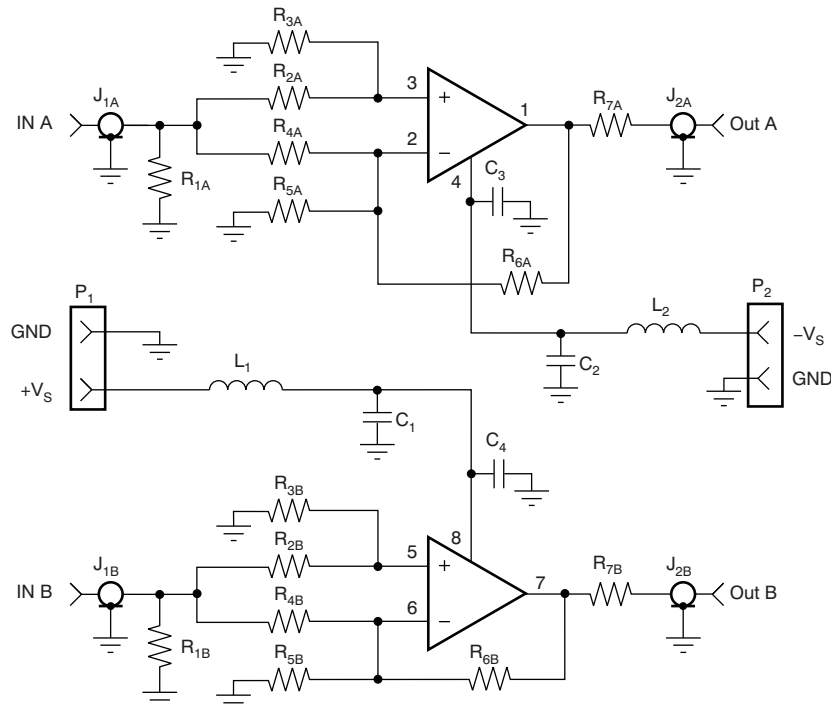
The DEM-OPA-SOT-2A demonstration fixture is a generic, unpopulated printed circuit board (PCB) for dual high-speed operational amplifiers in SOT23-8 packages. [Figure 1](#) shows the package pinout for this PCB. For more information on these op amps, as well as good PCB layout techniques, see the individual amplifier data sheets.



**Figure 1. SOT-23-8 Package Pinout, Top View**

### **2 Circuit**

The circuit schematic in [Figure 2](#) shows the connections for all possible components. Each configuration uses only some of the components.



**Figure 2. Schematic for DEM-OPA-SOT-2A**

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### 3 Components

Components that have RF performance similar to the ones listed in [Table 1](#) may be substituted.

**Table 1. Component Descriptions**

PART	DESCRIPTION
C <sub>1</sub> , C <sub>2</sub>	Tantalum Chip Capacitor, SMD EIA Size 3528, 20V
C <sub>3</sub> , C <sub>4</sub>	Multilayer Ceramic Chip Capacitor, SMD 1206, 50V
J <sub>1A</sub> – J <sub>2B</sub>	SMA or SMB Board Jack (Amphenol 901-144-8)
L <sub>1</sub> , L <sub>2</sub>	EMI-Suppression Ferrite Chip, SMD 1206 (Steward LI 1206 B 900 R)
P <sub>1</sub> , P <sub>2</sub>	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
R <sub>1A</sub> – R <sub>7B</sub>	Metal Film Chip Resistor, SMD 1206, 1/8W

R<sub>1</sub> and R<sub>7</sub> set the I/O impedance; R<sub>2</sub> through R<sub>6</sub> set the gain; and C<sub>1</sub> through C<sub>4</sub> are supply bypass capacitors. L<sub>1</sub> and L<sub>2</sub> are ferrite chips that can reduce interactions with the power supply at high frequencies. If not desired, they can be replaced with 0Ω resistors.

For single-supply operation, do not connect P<sub>2</sub>, L<sub>2</sub> and C<sub>2</sub>. Use a 0Ω resistor in place of C<sub>3</sub>.

**Voltage Feedback Amplifier Circuit Configuration**—These op amps have the pinout illustrated in [Figure 1](#). [Table 2](#) lists typical values used. To select component values for a specific op amp, consult the respective data sheet.

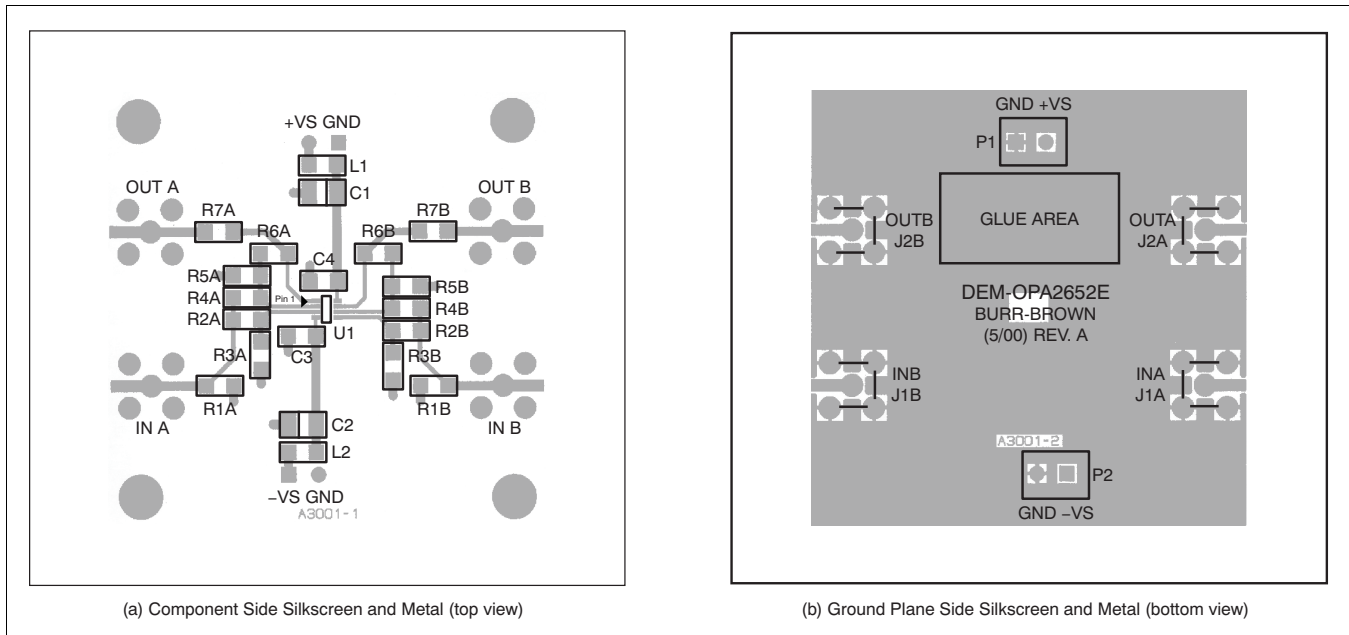
**Table 2. Circuit Configuration<sup>(1)</sup>**

COMPONENT	DUAL-SUPPLY (G = +2)	DUAL-SUPPLY (G = -1)	SINGLE-SUPPLY (G = +1)
R <sub>1</sub>	49.9Ω	57.6Ω	49.9Ω
R <sub>2</sub>	174Ω	Open	0Ω
R <sub>3</sub>	Open	205Ω	Open
R <sub>4</sub>	Open	402Ω	Open
R <sub>5</sub>	402Ω	Open	Open
R <sub>6</sub>	402Ω	402Ω	24.9Ω
R <sub>7</sub>	49.9Ω	49.9Ω	49.9Ω
C <sub>1</sub>	2.2μF	2.2μF	2.2μF
C <sub>2</sub>	2.2μF	2.2μF	Open
C <sub>3</sub>	0.1μF	0.1μF	0Ω
C <sub>4</sub>	0.1μF	0.1μF	0.1μF

(1) The values and gains listed here will not work for all op amps. See the specific data sheet to select proper values. The I/O impedances are 50Ω.

## 4 Board Layout

This demonstration fixture is a two-layer PCB. (See Figure 3.) It uses both a ground plane and power traces on the inner layers. The ground plane has been opened up around op amp pins that are sensitive to capacitive loading. Power-supply traces are laid out to keep current loop areas to a minimum. The SMA (or SMB) connectors may be mounted either vertically or horizontally onto the board edge. The location and type of capacitors used for power-supply bypassing are crucial for high-frequency amplifiers. The tantalum capacitors,  $C_1$  and  $C_2$ , do not need to be close to pins 8 and 4 on the PCB and may be shared with other amplifiers. See the individual op amp data sheet for more information on proper board layout techniques and component selection.



- (1) The board name shown in the silkscreen is DEM-OPA2652E with the Burr-Brown Revision A design finalized in May 2000.

**Figure 3. DEM-OPA-SOT-2A Demonstration Board Layout**

## 5 Measurement Tips

This demonstration fixture, with the component values shown, is designed to operate in a 50Ω environment; most data sheet plots are obtained under these conditions. It is easy to change the component values for different input and output impedance levels. However, do not use high-impedance probes; they represent a heavy capacitive load to the op amp, and will alter the amplifier response. Instead, use low-impedance ( $\leq 500\Omega$ ) probes with adequate bandwidth. The probe input capacitance and resistance set an upper limit on the measurement bandwidth. If a high-impedance probe must be used, place a 100Ω resistor on the probe tip to isolate its capacitance from the circuit.

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