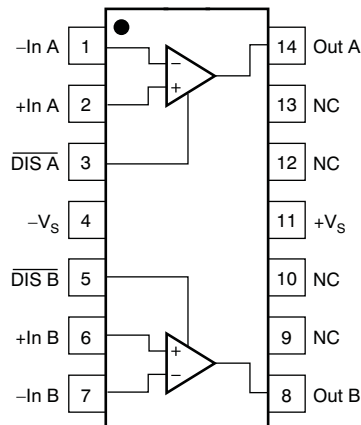


## **DEM-OPA-SO-2D Demonstration Fixture**

### **1 Description**

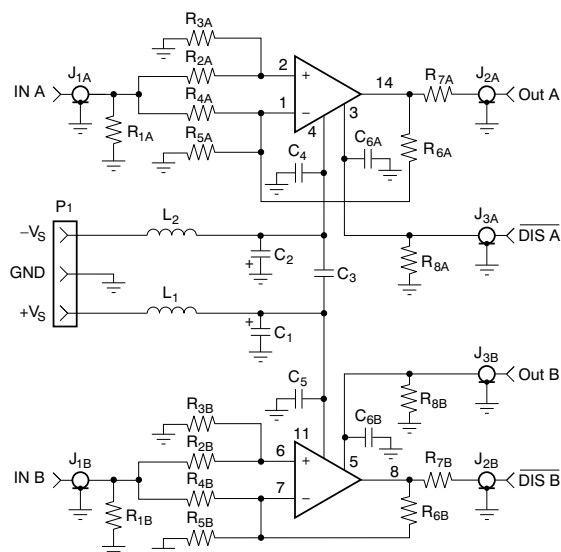
The DEM-OPA-SO-2D demonstration fixture is a generic, unpopulated printed circuit board (PCB) for dual high-speed operational amplifiers with disable in SO-14 packages. [Figure 1](#) shows the package pinout for this PCB. For more information on these op amps, as well as good PCB layout techniques, see the individual amplifier data sheets.



**Figure 1. SO 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-SO-2D**

## 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>6B</sub>	Multilayer Ceramic Chip Capacitor, SMD 1206, 50V
J <sub>1A</sub> – J <sub>3B</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>	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
R <sub>1A</sub> – R <sub>8B</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; R<sub>8</sub> and C<sub>6</sub> set up the disable pin; and C<sub>1</sub> through C<sub>5</sub> are supply bypass capacitors. C<sub>3</sub> is optional; it adds a bypass between the supplies that improves distortion performance for some models. 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 L<sub>2</sub>; otherwise, the -V<sub>S</sub> input to P<sub>1</sub> would be at ground potential.

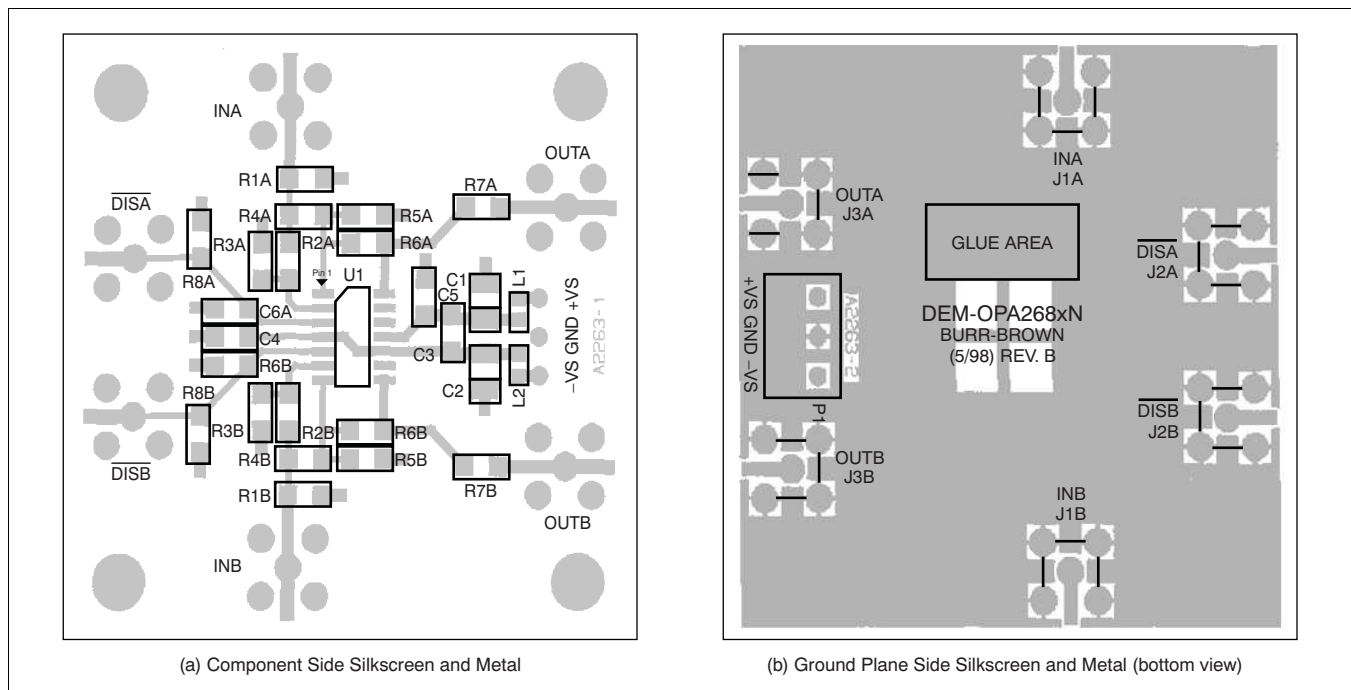
**Disable Pin**—Pins 3 and 5 disable op amps A and B when low. Table 2 shows different ways to set up the voltage on these pins.

**Table 2. Disable Pin**

CONFIGURATION	$R_g$	$C_6$
External Service	49.9 $\Omega$	Open
On	Open	0.1 $\mu$ F
Off	0 $\Omega$	Open

#### 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 11 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-OPA268xN with the Burr-Brown Revision B design finalized in May 1998.

**Figure 3. DEM-OPA-SO-2D Demonstration Board Layout**

## 5 Measurement Tips

This demonstration fixture, with the component values shown, is designed to operate in a  $50\Omega$  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  $100\Omega$  resistor on the probe tip to isolate its capacitance from the circuit.

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