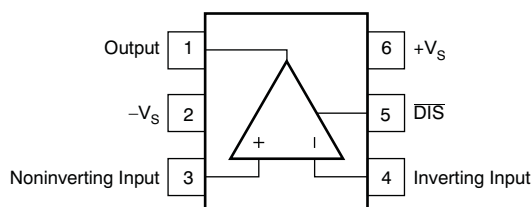


## DEM-OPA-SOT-1B User's Guide

### 1 Description

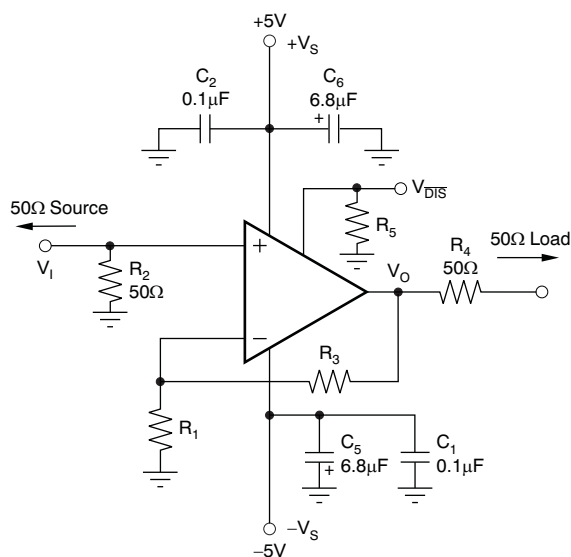
The DEM-OPA-SOT-1B demonstration fixture is a noninverting configuration, unpopulated printed circuit board (PCB) for single op amps in SOT23 packages. This board has been optimized to minimize parasitics and provide good harmonic distortion for wideband, high-gain, high-speed amplifiers. [Figure 1](#) shows the package pinout for this PCB. For more information on these types of op amps, as well as good PCB layout techniques, see the individual op amp data sheets.



**Figure 1. Package Pinout**

### 2 Circuit

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



**Figure 2. Schematic for DEM-OPA-SOT-1B**

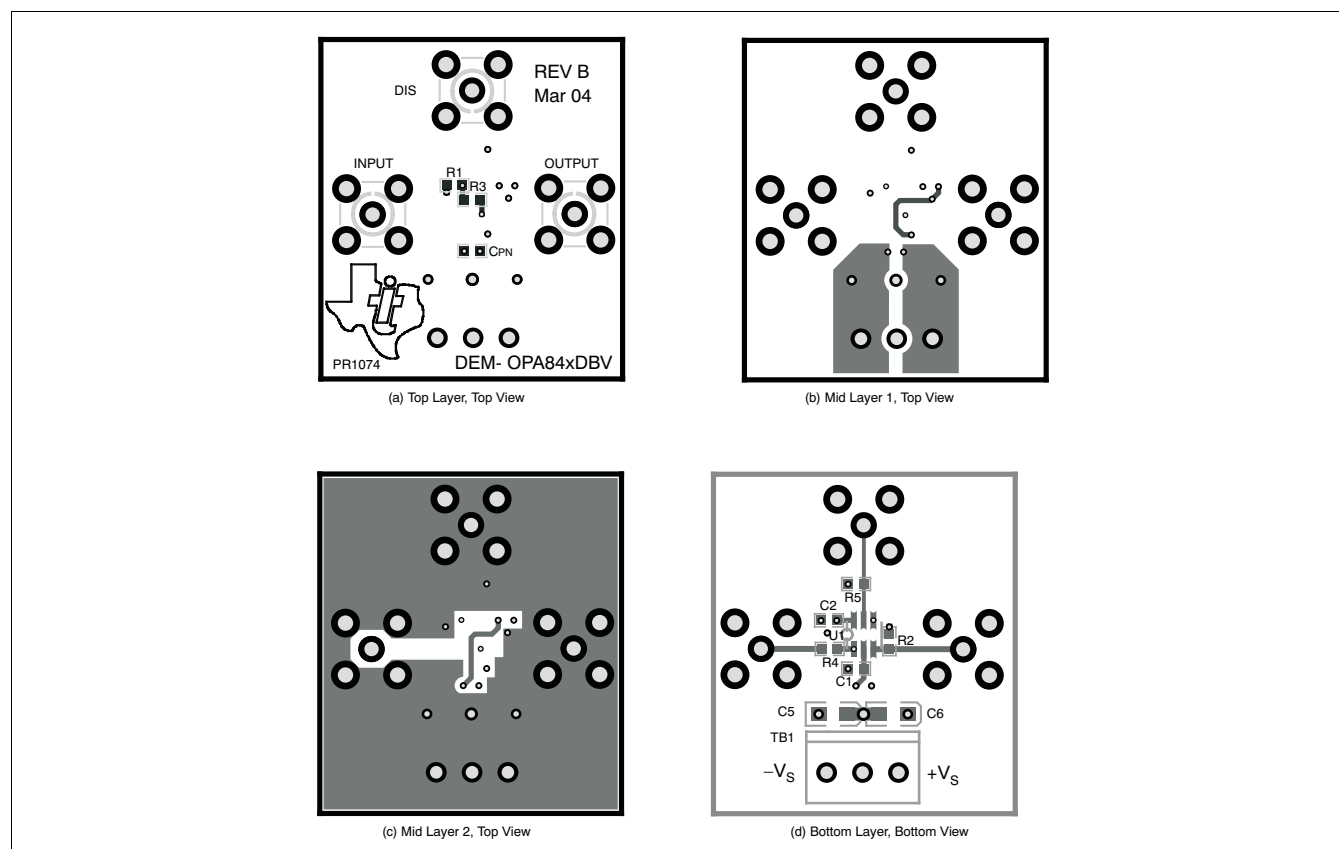
### 3 Components

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

**Table 1. Component Descriptions**

| PART                      | DESCRIPTION                                                   |
|---------------------------|---------------------------------------------------------------|
| $C_5, C_6$                | Tantalum Chip Capacitor, SMD EIA Size 3216, 20V               |
| $C_1, C_2, C_{PN}$        | Multilayer Ceramic Chip Capacitor, SMD 0603, 50V              |
| INPUT, OUTPUT, DIS        | SMA or SMB Board Jack (Amphenol 901-144-8)                    |
| TB1                       | Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS) |
| $R_1, R_2, R_3, R_4, R_5$ | Metal Film Chip Resistor, SMD 0603, 1/8W                      |

Please refer to [Figure 3](#) for the location of the following components.  $R_2$  and  $R_4$  set the I/O impedance;  $R_1$  and  $R_3$  set the gain; and  $C_1, C_2, C_5, C_6$  and  $C_{PN}$  are supply bypass capacitors.  $C_{PN}$  is optional; it adds a bypass between the supplies, which improves distortion performance for some models.  $R_5$  is the matching resistor for the disable pin.



- (1) The board name shown in the top silkscreen is DEM-OPA84xDBV with the Revision B design finalized in March 2004.

**Figure 3. DEM-OPA-SOT-1B Demonstration Fixture Layout**

## 4 Board Layout

This demonstration fixture is a four-layer PCB. Mid-layer 1 has only power traces. Mid-layer 2 has both ground and power traces. The ground plane has been opened up around op amp pins sensitive to capacitive loading. Power-supply traces are laid out to keep current loop areas to a minimum. Mount the SMA (or SMB) connectors vertically. The location and type of capacitors used for power-supply bypassing are crucial to high-frequency amplifiers. The tantalum capacitors,  $C_{BYP}V_{SP}$  and  $C_{BYP}V_{SN}$ , do not need to be as close to pins 6 and 2 on the PCB, and may be shared with other amplifiers. See the individual op amp data sheets for more information on component selection.

## 5 Measurement Tips

This demonstration fixture, and the component values shown, is designed to operate in a  $50\Omega$  environment. Most data sheet plots are obtained this way. It is easy to change the component values for different input and output impedance levels. 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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