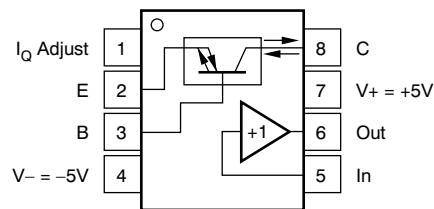


## DEM-OTA-SO-1A Demonstration Fixture

### 1 Description

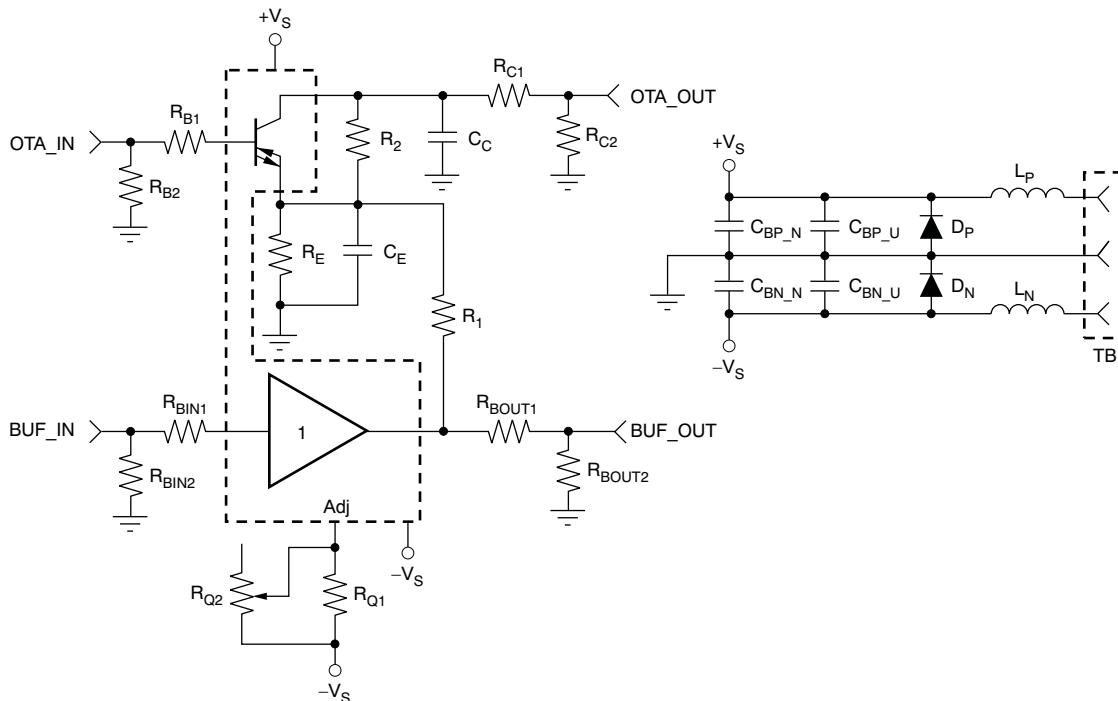
The DEM-OTA-SO-1A demonstration fixture is a generic, unpopulated printed circuit board (PCB) for single operational transconductance amplifiers in SO-8 packages. [Figure 1](#) shows the package pinout for this PCB. For more information on these op amps, as well as good PCB layout techniques, see the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



**Figure 1. 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-OTA-SO-1A**

### 3 Components

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

**Table 1. Component Descriptions**

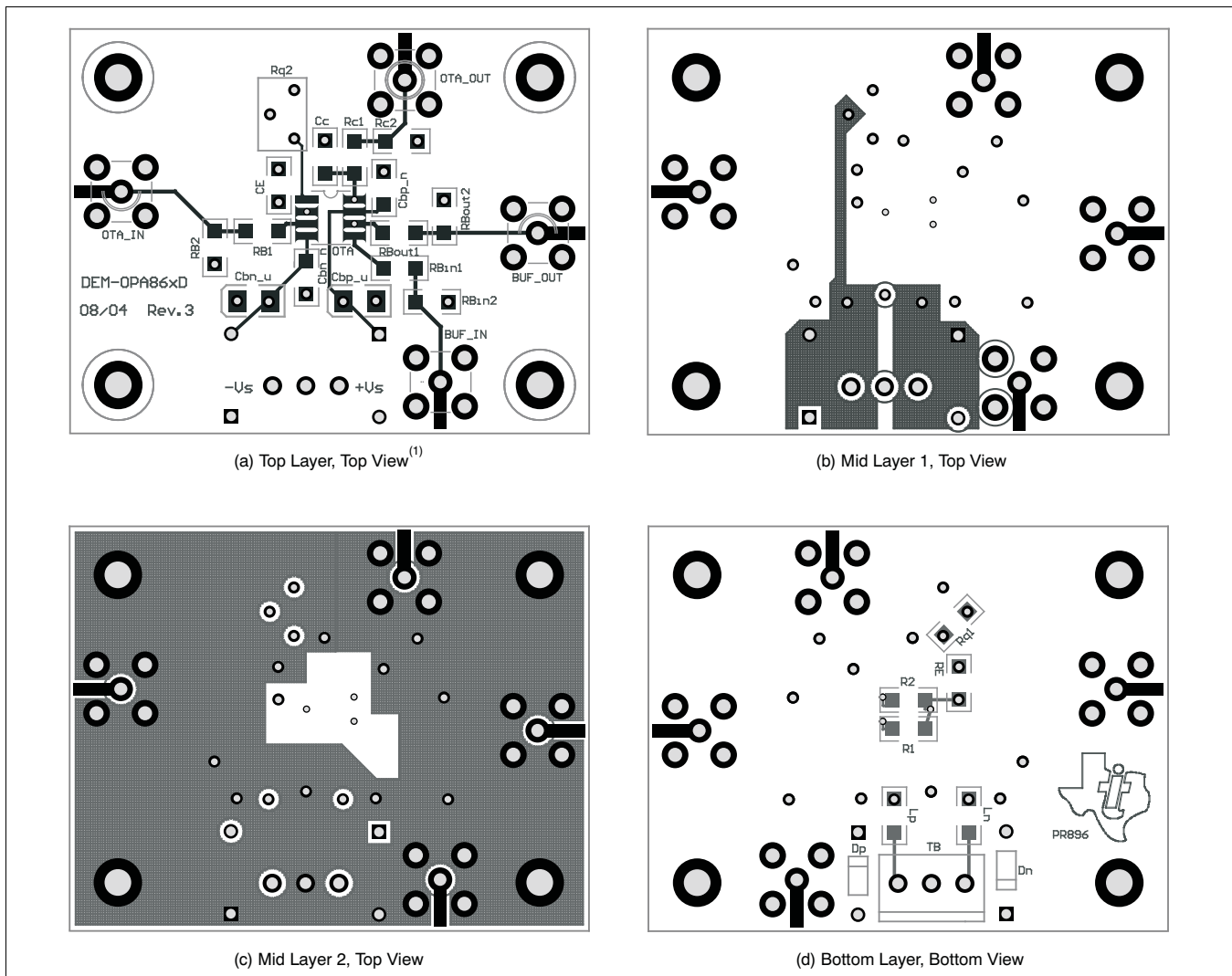
PART	DESCRIPTION
$C_{BP\_U}$ , $C_{BN\_U}$	Tantalum Chip Capacitor, SMD EIA Size 3528, 20V
$C_{BP\_N}$ , $C_{BN\_N}$ , $C_C$ , $C_E$	Multilayer Ceramic Chip Capacitor, SMD 1206, 50V
OTA_IN, OTA_OUT, BUF_IN, BUF_OUT	SMA or SMB Board Jack (Amphenol 901-144-8)
$L_P$ , $L_N$	EMI-Suppression Ferrite Chip, SMD 1206 (Steward LI 1206 B 900 R)
TB	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
$R_{XXX}$	Metal Film Chip Resistor, SMD 1206, 1/8W

Please refer to [Figure 3](#) for the location of the following components:

- $R_{B2}$ ,  $R_{C1}$ , and  $R_{C2}$  set the desired input/output impedances of the OTA section.
- $R_{BIN2}$ ,  $R_{BOUT1}$ , and  $R_{BOUT2}$  set the desired input/output impedances of the buffer section.
- $R_{BIN1}$ , and  $R_{B1}$  are used to form a band-limiting pole at high frequency with the parasitic input capacitance.
- Either  $R_{Q1}$  or  $R_{Q2}$  is used to set the quiescent current of the OTA section.
- $R_E$  (used in conjunction with  $R_{C1}$  and  $R_{C2}$ ) sets the gain.
- $R_1$ ,  $R_2$ ,  $C_C$ , and  $C_E$  are used in application circuits. Please refer to the individual product data sheet when using these components.

## 4 Board Layout

This demonstration fixture is a four-layer PCB. 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,  $C_{BP\_U}$  and  $C_{BN\_U}$ , do not need to be close to pins 4 and 7 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 appearing in the top silkscreen is DEM-OPA86xD with the Revision 3 design finalized in August 2004.

**Figure 3. DEM-OTA-SO-1A 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 this way. 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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