

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.

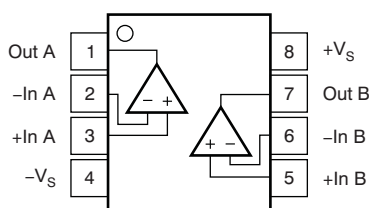


Figure 1. SOT-23-8 Package Pinout, Top View

2 Circuit

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

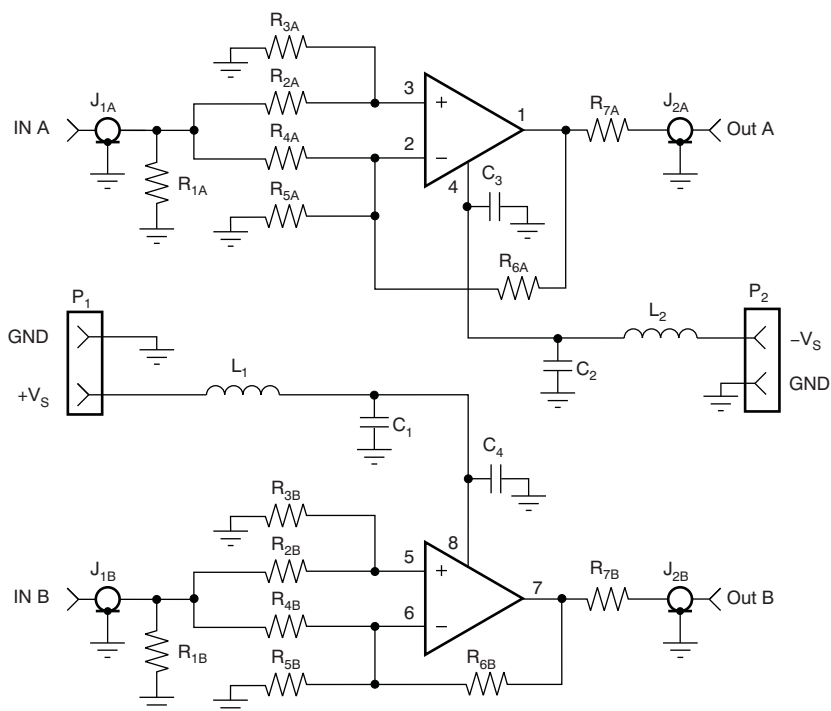


Figure 2. Schematic for DEM-OPA-SOT-2A

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

R₁ and R₇ set the I/O impedance; R₂ through R₆ set the gain; and C₁ through C₄ are supply bypass capacitors. L₁ and L₂ 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 P₂, L₂ and C₂. Use a 0Ω resistor in place of C₃.

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.

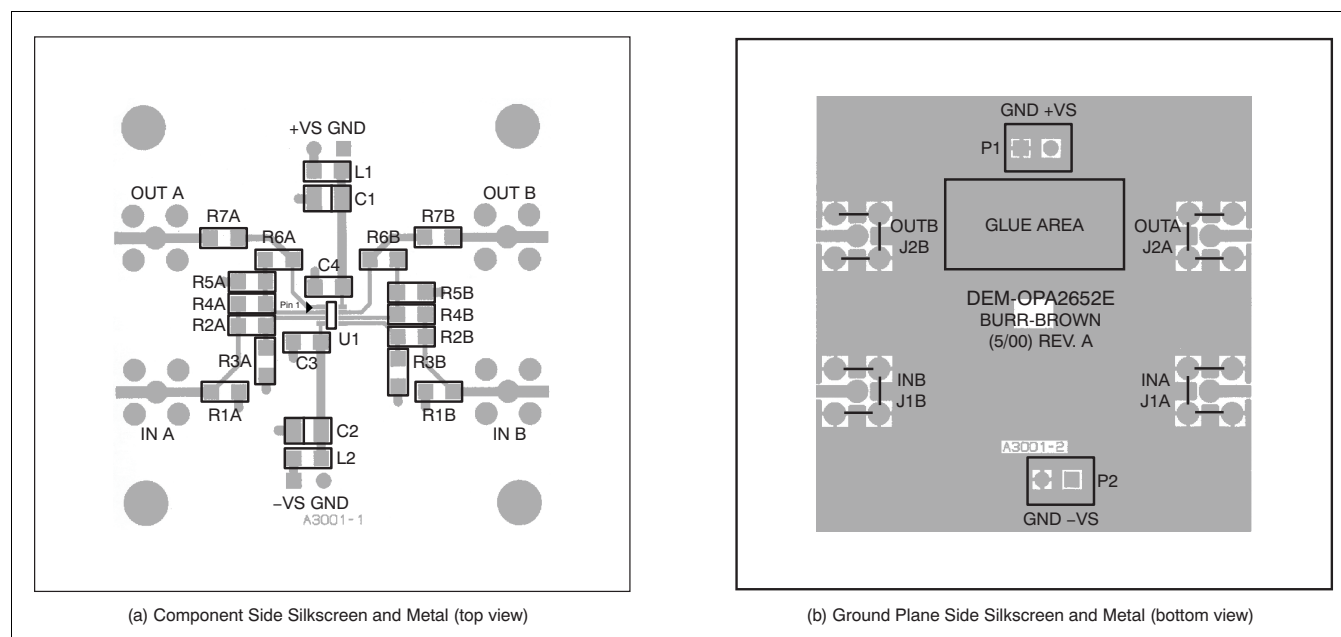
Table 2. Circuit Configuration⁽¹⁾

COMPONENT	DUAL-SUPPLY (G = +2)	DUAL-SUPPLY (G = -1)	SINGLE- SUPPLY (G = +1)
R ₁	49.9Ω	57.6Ω	49.9Ω
R ₂	174Ω	Open	0Ω
R ₃	Open	205Ω	Open
R ₄	Open	402Ω	Open
R ₅	402Ω	Open	Open
R ₆	402Ω	402Ω	24.9Ω
R ₇	49.9Ω	49.9Ω	49.9Ω
C ₁	2.2μF	2.2μF	2.2μF
C ₂	2.2μF	2.2μF	Open
C ₃	0.1μF	0.1μF	0Ω
C ₄	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 50 Ω 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 Ω resistor on the probe tip to isolate its capacitance from the circuit.

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