DEM-OPA-SO-1E Demonstration Fixture

1 Description

The DEM-OPA-SO-1E demonstration fixture is a generic, unpopulated printed circuit board (PCB) for a single, 4:1 multiplexer in an SO-14 package. Figure 1 shows the package pinout used for this PCB. For more information on these types of amplifiers, as well as good PCB layout techniques, see the individual amplifier data sheets.

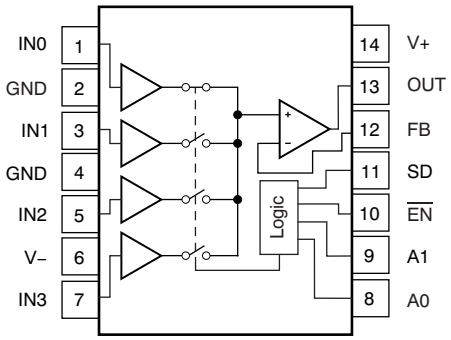

Figure 1. SO-14 Package Pinout, Top View

2 Circuit

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

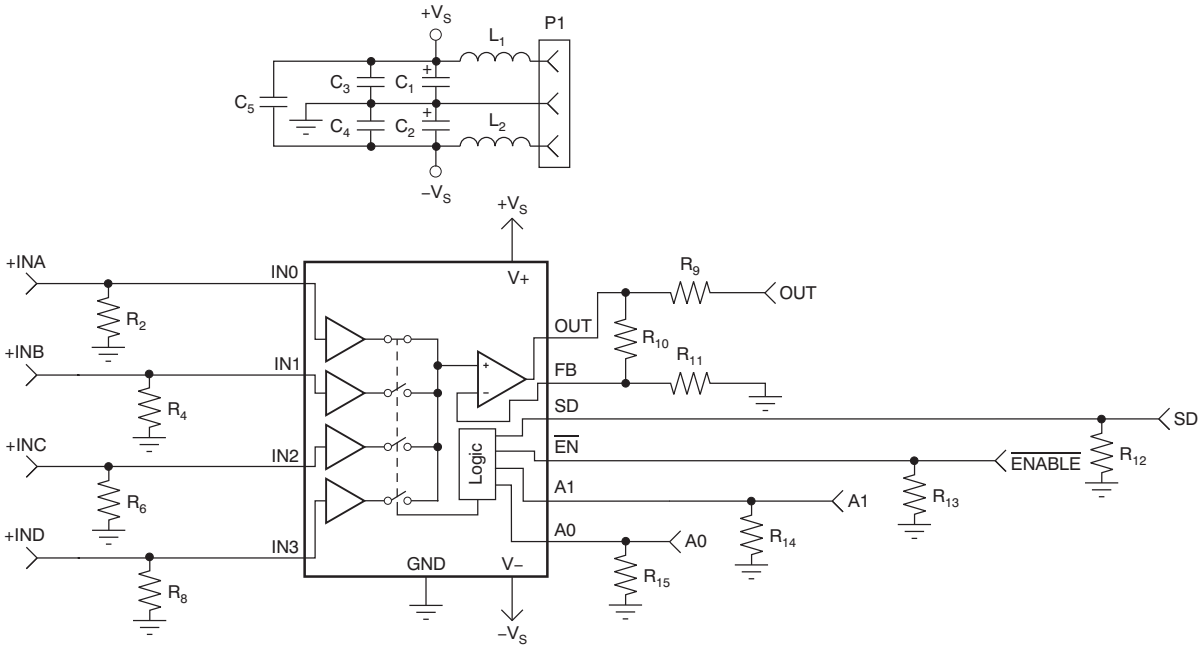

Figure 2. Schematic for DEM-OPA-SO-1E

3 Components

Components that have RF performance similar to the ones 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_3, C_4	Multilayer Ceramic Chip Capacitor, SMD 0603, 50V
+INA, +INB, +INC, +IND, SD, $\overline{\text{ENABLE}}$, A0, A1	SMA or SMB Board Jack (Amphenol 901-144-8)
L_1, L_2	EMI-Suppression Ferrite Chip, SMD 0603 (Steward LI 0603 B 900 R)
P_1	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
R_{XX}	Metal Film Chip Resistor, SMD 0603, 1/8W

Refer to Figure 3 for the location of the following components:

- R_2, R_4, R_6, R_8, and R_9 set the I/O input impedance.
- R_{10} and R_{11} set the gain.
- R_{12}, R_{13}, R_{14}, and R_{15} set the I/O input impedance for the control pins A0, A1, SD, and $\overline{\text{EN}}$.
- C_1 through C_5 are power supply bypass capacitors.

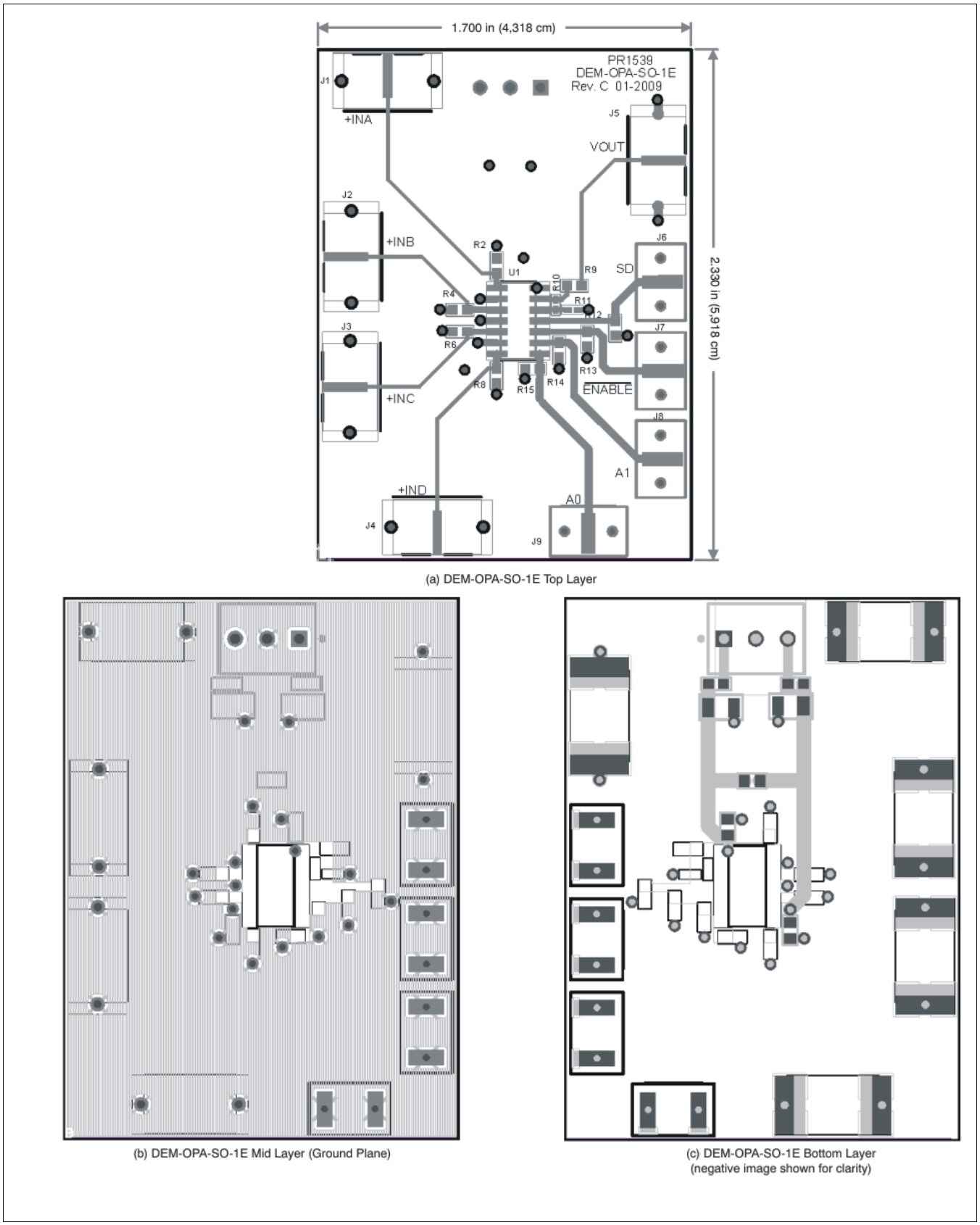

Figure 3. DEM-OPA-SO-1E Demonstration Fixture Layout

4 Board Layout

This demonstration fixture is a four-layer PCB. It uses a ground plane bottom layer. The ground plane has been opened up around op amp pins that are sensitive to capacitive loading. Power-supply traces are laid out in the internal planes. The SMA (or SMB) connectors may be mounted 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_5 and C_6, do not need to be close to pins 4 and 14 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.

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 (≤ 500Ω) 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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