DEM-OPA-SSOP-3C Demonstration Fixture

1 Description

The DEM-OPA-SSOP-3C demonstration fixture is a non-inverting configuration, unpopulated printed circuit board (PCB) for high-speed triple operational amplifiers in SSOP-16 packages with flow-through pinout. Figure 1 shows the package pinouts supported by this PCB. For more information on any individual op amps, as well as good PCB layout techniques, see the individual amplifier data sheets.

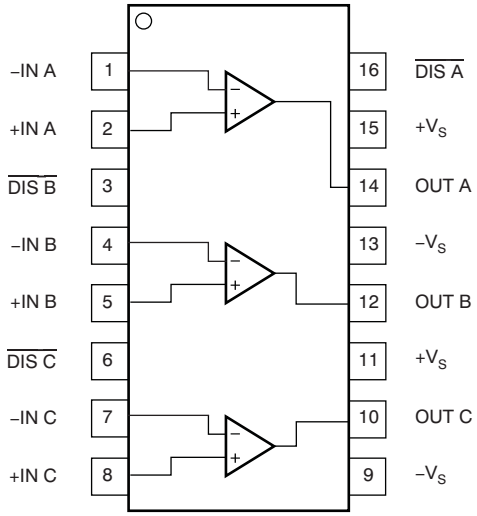


Figure 1. SSOP-16 Package Pinout, Top View

2 Circuit

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

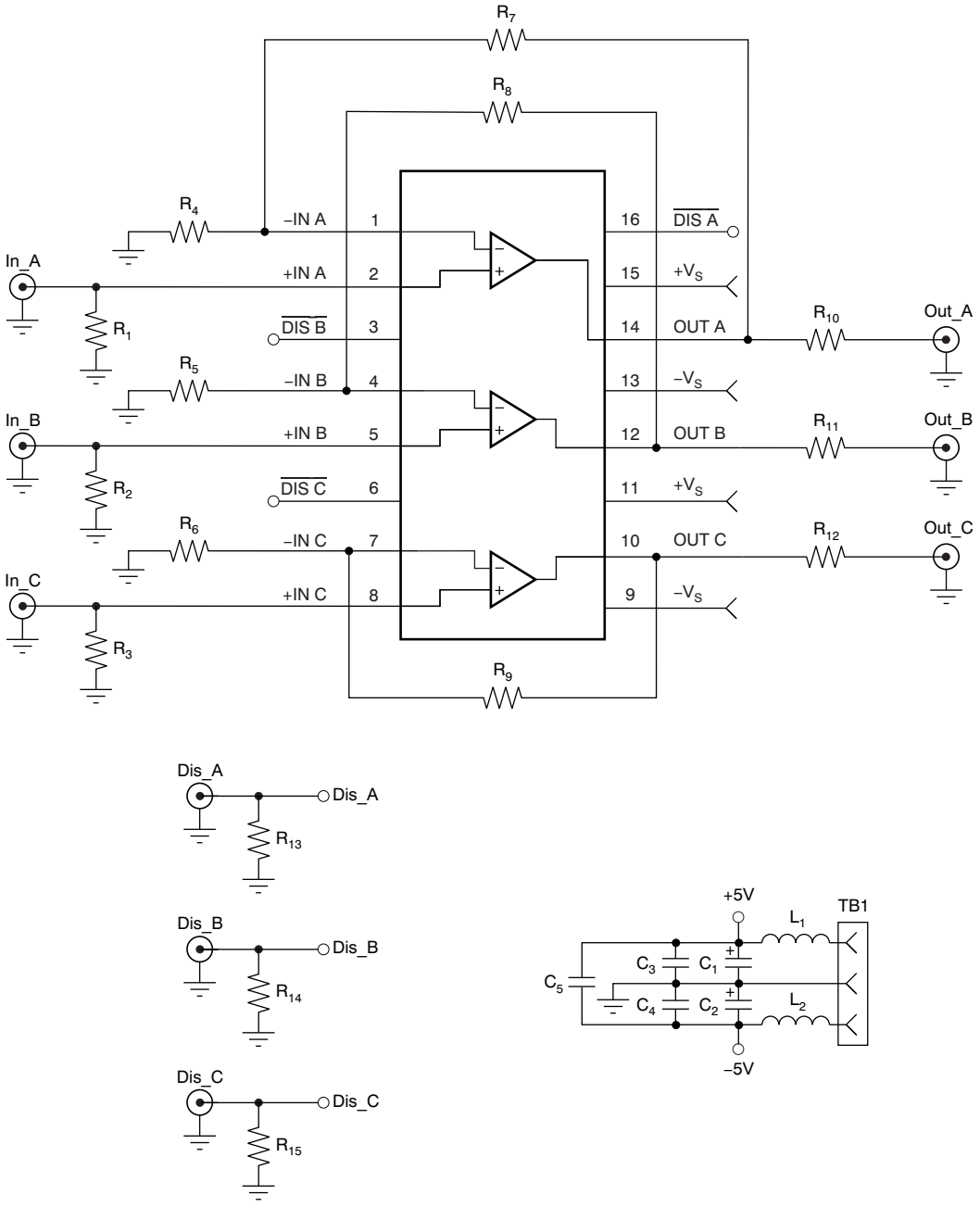


Figure 2. Schematic for DEM-OPA-SSOP-3C

3 Components

Components that have RF performance similar to the ones listed in Figure 2 may be substituted. C_1 and C_2 need a larger voltage rating for ±15V dual supplies.

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 0603, 50V
C_5	Multilayer Ceramic Chip Capacitor, SMD 0805, 50V
IN_A, IN_B, IN_C, OUT_A, OUT_B, OUT_C, Dis_A, Dis_B, Dis_C	SMA or SMB Board Jack (Amphenol 901-144-8)
L_1, L_2	EMI-Suppression Ferrite Chip, SMD 0805 (Steward LI 0805 B 900 R)
TB_1	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
R_1 – R_{15}	Metal Film Chip Resistor, SMD 0402, 1/8W

R_1 through R_3 and R_{10} through R_{15} set the I/O impedance, R_4 through R_9 set the gain, and C_1 through C_5 are supply bypass capacitors. C_5 is optional; it adds a bypass between the supplies that improves distortion performance for some models. L_1 and L_2 are ferrite chips that can reduce interactions with the power supply at high frequencies. If not desired, they can be replaced with 0Ω resistors.

4 Board Layout

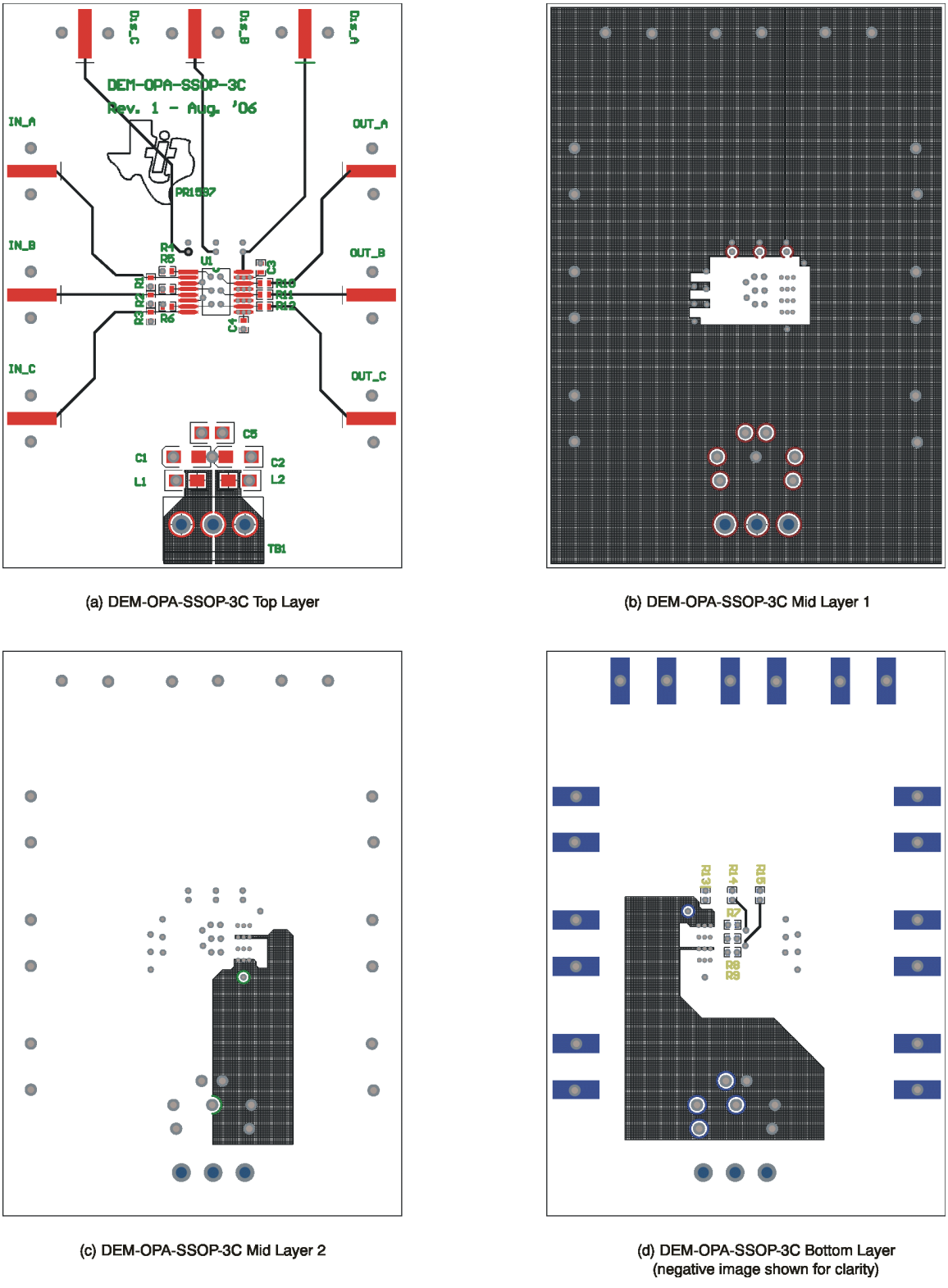
This demonstration fixture is a four-layer PCB. (See Figure 3.) It uses a ground plane on an inner layer, and signal and power traces on the top. The ground plane has been opened up around op amp pins sensitive to capacitive loading. Power-supply traces are laid out to keep current loop areas to a minimum. The SMA (or SMB) connectors may be mounted either vertically or horizontally.

The location and type of capacitors used for power-supply bypassing are crucial to high-frequency amplifiers. The tantalum capacitors, C_1 and C_2, do not need to be as close to pins 7 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.

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.



(a) DEM-OPA-SSOP-3C Top Layer

(b) DEM-OPA-SSOP-3C Mid Layer 1

(c) DEM-OPA-SSOP-3C Mid Layer 2

(d) DEM-OPA-SSOP-3C Bottom Layer
(negative image shown for clarity)

Figure 3. DEM-OPA-SSOP-3C Demonstration Board Layout

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