1 Description

The DEM-OPA-SO-1C demonstration fixture is a generic, unpopulated printed circuit board (PCB) for a single, wide bandwidth, DC restoration circuit in an SO-14 package. 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 amplifier data sheets.

NOTE: (1) No Connection.

Figure 1. SO Package Pinout, Top View
The circuit schematic in Figure 2 shows the connections for all possible components. Each configuration uses only some of the components.

![Circuit Diagram]

**Figure 2. Schematic for DEM-OPA-SO-1C**

### 3 Components

Components that have RF performance similar to the ones in Table 1 may be substituted.

<table>
<thead>
<tr>
<th>PART</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_{5}, C_{6}</td>
<td>Tantalum Chip Capacitor, SMD EIA Size 3516, 20V</td>
</tr>
<tr>
<td>C_{1}, C_{2}, C_{3}, C_{4}</td>
<td>Multilayer Ceramic Chip Capacitor, SMD 1206, 50V</td>
</tr>
<tr>
<td>OTA_IN, OTA_OUT, IN, TTL, C_{HOLD}</td>
<td>SMA or SMB Board Jack (Amphenol 901-144-8)</td>
</tr>
<tr>
<td>L_{1}, L_{2}</td>
<td>EMI-Suppression Ferrite Chip, SMD 1206 (Steward LI 1206 B 900 R)</td>
</tr>
<tr>
<td>TB_{1}</td>
<td>Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)</td>
</tr>
<tr>
<td>R_{XX}</td>
<td>Metal Film Chip Resistor, SMD 1206, 1/8W</td>
</tr>
</tbody>
</table>

Please refer to Figure 3 for the location of the following components:

- R_{3}, R_{4}, R_{9} and R_{13,12} set the desired input/output impedances of the Operational Transconductance Amplifier (OTA) section.
- R_{5} is used to set the gain of the OTA section.
- R_{10}, R_{11}, R_{13}, and R_{14} set the desired input/output impedances of the sampling OTA section.
- C_{1} is the hold capacitor.
- R_{7} and R_{8} sets the input impedance for the TTL control.
- C₂, C₃, C₄, C₅, and C₆ are supply bypass capacitors. C₂ is optional; it adds a bypass between the supplies, which may improve distortion performance.
- 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.

Figure 3. DEM-OPA-SO-1C Demonstration Fixture Layout
4 Board Layout

This demonstration fixture is a two-layer PCB. It uses both a ground plane and power traces on the top and bottom. 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, C5 and C6, do not need to be close to pins 5 and 13 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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