

DEM-VCA-SO-1B Demonstration Fixture

1 Description

The DEM-VCA-SO-1B demonstration fixture is an unpopulated printed circuit board (PCB) for single voltage controlled amplifier in SO-14 packages. [Figure 1](#) shows the package pinout for this PCB. For more information on these amplifiers, and good PCB board layout techniques, see the individual amplifier data sheets.

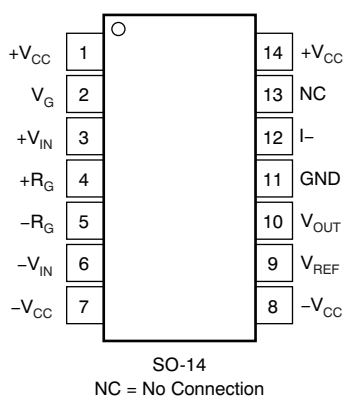


Figure 1. Buffer Pinout Compatible with DEM-VCA-SO-1B

2 Circuit

The circuit schematic illustrated in [Figure 2](#) shows the connections for all possible components.

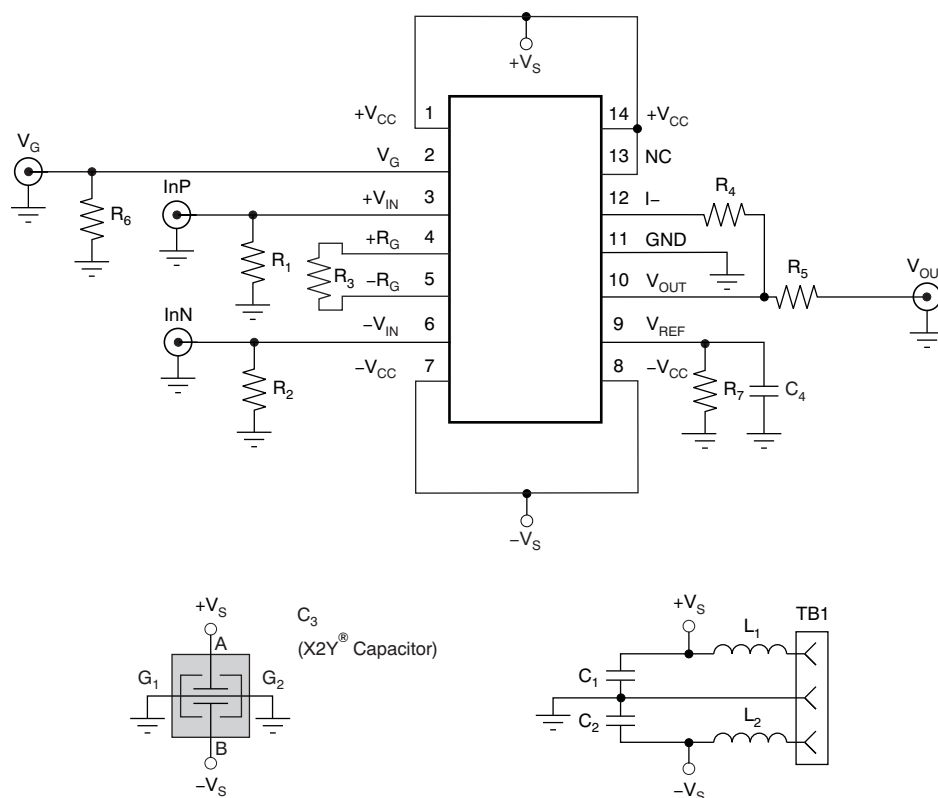


Figure 2. Schematic

3 Components

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

Table 1. Component Descriptions

PART	DESCRIPTION
L ₁ , L ₂	EMI-Suppression Ferrite Chip, SMD 0805
C ₁ , C ₂	Tantalum Chip Capacitor, SMD EIA Size 3216, 20V
C ₃	X2Y® capacitor, Yageo X0603MRX7R6BB104)
C ₄	Multi-Layer Ceramic Chip Capacitor, SMD 0603, 50V
InP, InN, V _G , V _{OUT}	SMA or SMB Board Jack (Amphenol 901-144-8)
TB	Terminal Block, 3.5mm Centers (On-Shore Technology ED555/3DS)
R ₁ – R ₄ , R ₆ , R ₇	Metal Film Chip Resistor, SMD 0402, 1/8W
R ₅	Metal Film Chip Resistor, SMD 0603, 1/8W

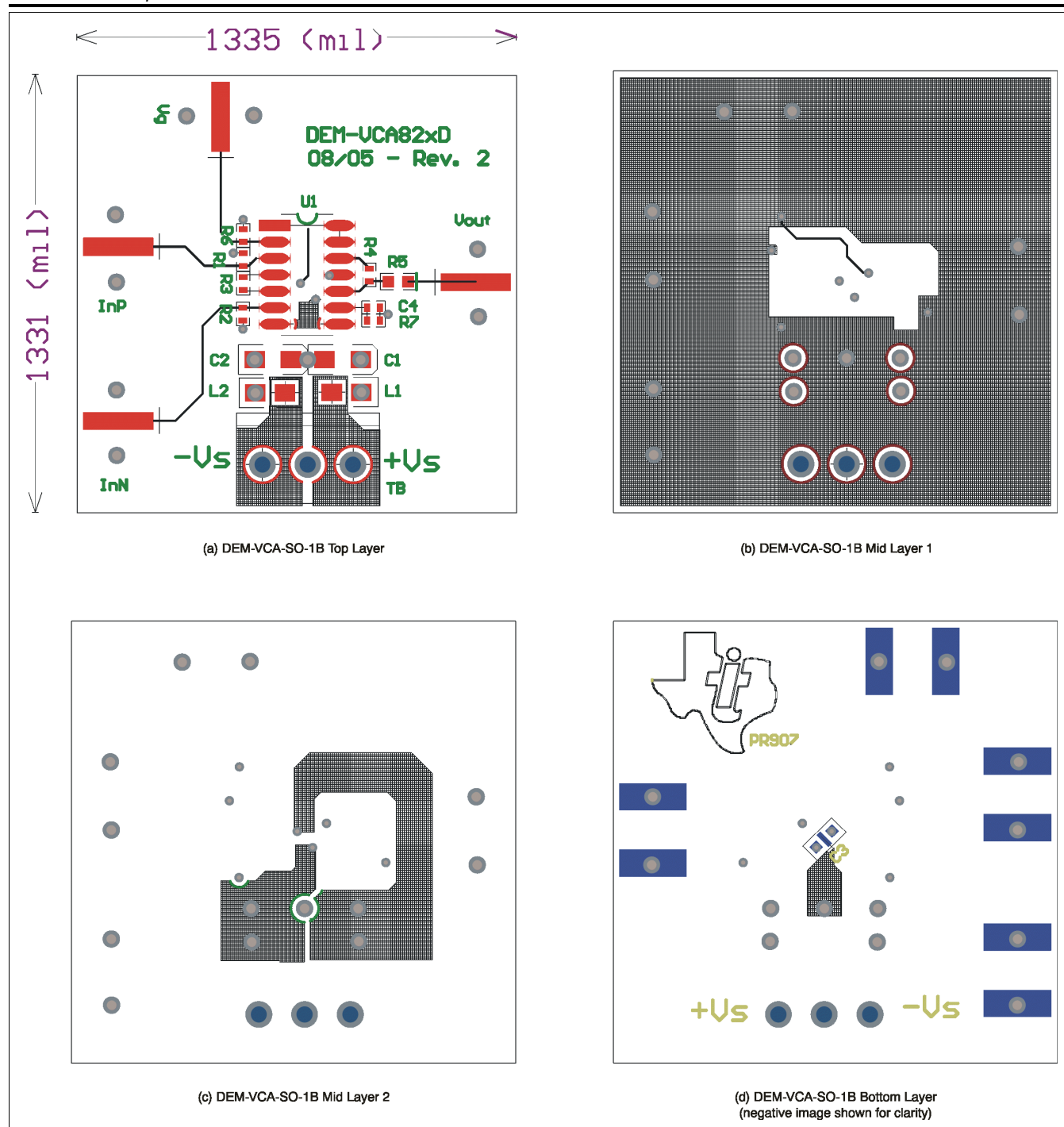
R₁, R₂, R₅ and R₆ set the I/O impedance for the signal chain and the control pin. R₃ and R₄ set the gain for the device; R₇ and C₄ are connected to the reference voltage pin. 10Ω to 20Ω is recommended on this pin at all time. To limit the noise contribution of this resistor, a 0.1μF capacitor in parallel with R₇ is recommended. C₁, C₂ and C₃ are supply bypass capacitors.

4 Board Layout

This demonstration board is a four-layer PCB. It has separate ground and power planes in the inner layers. These planes have been opened up around op amp pins sensitive to capacitive loading. InP, InN, V_{OUT} and V_G are to be mounted horizontally onto the board edge. The location and type of capacitors used for power-supply bypassing are crucial to high-frequency amplifiers. The tantalum capacitors, C₁ and C₂, do not need to be as close to pins 1 and 5 on the PCB and may be shared with other amplifiers. See the individual amplifier data sheets for more information on proper board layout techniques and component selection.

5 Measurement Tips

This demonstration board, and the component values shown, is designed to operate in a 50Ω environment for the input and output and V_G control pins. Most data sheet plots are obtained under these conditions. It is easy to change the component values for different input and output impedance levels. Do not use very high impedance probes; they represent a heavy capacitive load to the amplifier and will alter their 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 100Ω resistor on the probe tip to isolate its capacitance from the circuit.



Note: The DEM-VCA82xD board shown on the top layer silkscreen is the demonstration fixture used with the DEM-VCA-SO-1B user guide.

Figure 3. DEM-VCA-SO-1B Demonstration Fixture Layout

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