



ABSTRACT

The DEM-OPA-RUN-EVM is a demonstration fixture that helps designers evaluate the operation and performance of TI's high speed, wide bandwidth operational amplifiers. This unpopulated PC board is compatible with dual channel amplifier products offered in the 10-pin QFN (RUN) package. The board is designed to accommodate multiple amplifier configurations to allow for maximum flexibility and ease of use.

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1 Features

- Configurable for single or split-supply operation
- Includes optional termination resistors on inputs and outputs for easy use with 50-Ω test equipment
- Feedback network components for inverting and non-inverting configurations
- Standard SMA footprints for input and output signal connections
- High speed optimized layout to reduce parasitic effects

2 Power Supply Connections

The DEM-OPA-RUN-EVM is equipped with test point connectors to easily power VCC, VEE, or GND. The positive supply input is labeled Vs+, the negative supply input is labeled Vs-, and the ground is labeled GND.

3 Operating Modes

The DEM-OPA-RUN-EVM can be configured to operate with a single supply voltage or with a split positive and negative supply. Additionally, the EVM can be configured for an inverting or non-inverting circuit with an optional second feedback loop that can include output isolation.

3.1 Single-Supply Operation

To operate the EVM as single supply, connect both the Vs- and GND connectors to ground, and apply the positive-supply voltage to Vs+. In this configuration, a populated output loads (C7, C7, R10, and R21) can present a DC load to ground for the amplifier as they are not referenced to mid-supply in the single-supply configuration. Additionally, the input resistors (R7, R13, R18, and R24) may pull the inputs of the amplifier to ground depending on the configuration. It is important to be aware of any device limitations in the mode of operation.

3.2 Split-Supply Operation

To operate as split supply, apply the positive-supply voltage to Vs+, negative-supply voltage to Vs-, and the ground reference from supply to GND. In this mode the shunt load components and input resistors are referenced to the mid-supply potential of ground.

3.3 Amplifier Configurations

The DEM-OPA-RUN-EVM can be configured to have either amplifier channels in inverting or non-inverting configurations as long as the appropriate resistors are populated. Additionally the EVM features a second feedback loop with a resistor and capacitor footprints (R1, R14, C1, and C8) that can be isolated from the output with a series resistor (R8 and R19). This second feedback loop can be used for several purposes. The second loop can be connected purely in parallel with the first loop to add filtering or capacitively coupled second gain resistor. Alternatively the primary feedback loops can be left open (R2 and R15) and the secondary feedback loop can be used to allow for series output resistance within the loop. Typically this is done to add a small amount of resistive isolation to an amplifiers output without affecting the desired output voltage when driving a resistive load.

Figure 5-1 shows the amplifiers in basic non-inverting unity gain configurations with 49.9 Ω series output loads.

4 Input and Output Considerations

The DEM-OPA-RUN-EVM is equipped with footprints for SMA connectors to connect the signal generators and analysis equipment. For best results, the inputs and outputs to the EVM should be terminated to 50-Ω impedances and signals must be routed to and from the EVM with cables having 50-Ω characteristic impedance. For non-inverting configurations INA+ and INB+ (J3 and J6) include termination resistors (R13 and R24), which can be populated with 50-Ω resistors. For inverting configurations, a resistor network (R3, R4, R7, R16, R17, and R18) is included to match the input impedance while maintaining a desired gain resistor value. OUTA and OUTB (J2 and J5) are the output connectors for the amplifiers. Resistor networks (R8, R9, R10, R19, R20, and R21) at the output of the amplifiers can be used to convert the signal to 50-Ω single-ended source while providing a larger total load to the amplifiers when terminated with 50-Ω loads. Output capacitors C7 and C9 may also be populated with resistors to allow for additional output configurations.

5 Schematic

Figure 5-1 shows an example of a non-inverting unity-gain schematic configuration for the DEM-OPA-RUN-EVM.

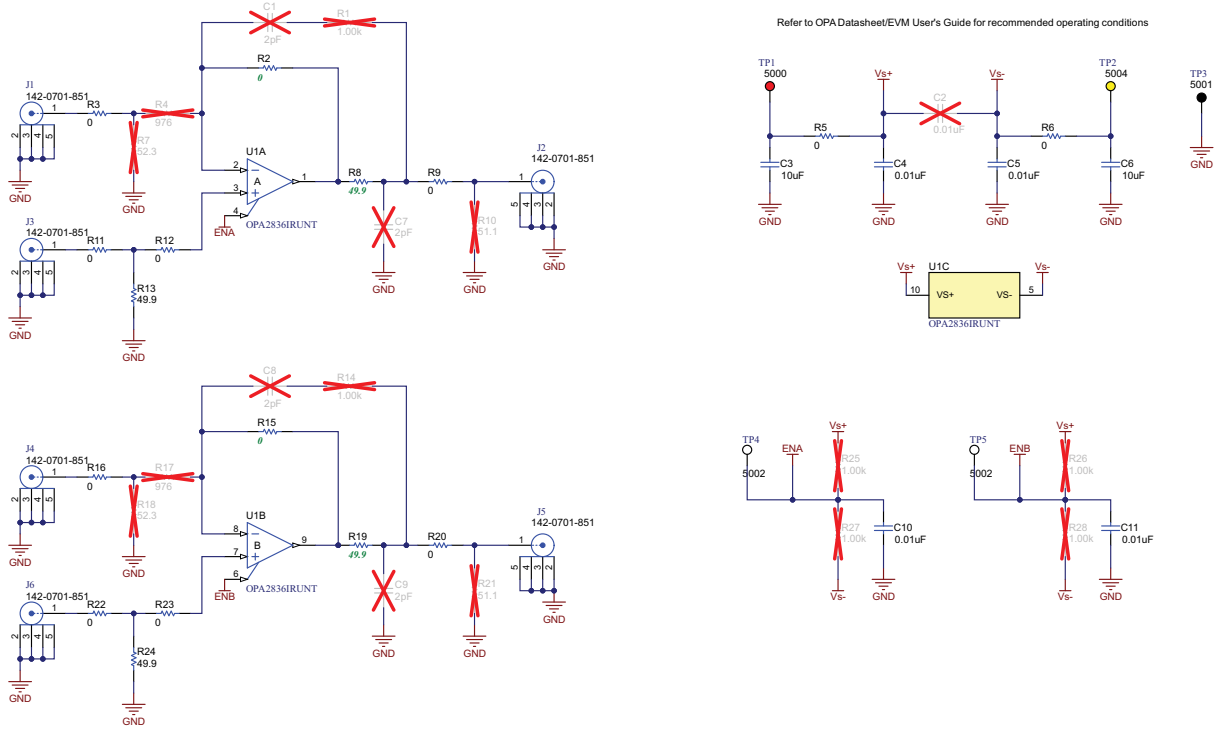


Figure 5-1. Schematic

6 Layout

Figure 6-1 through Figure 6-4 show the PCB layers of the DRM-OPA-RUN-EVM board.

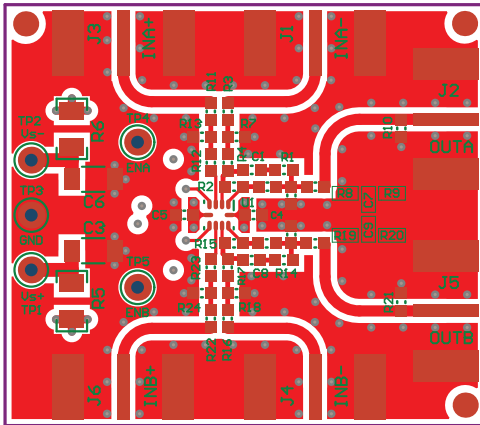


Figure 6-1. PCB Top Layers

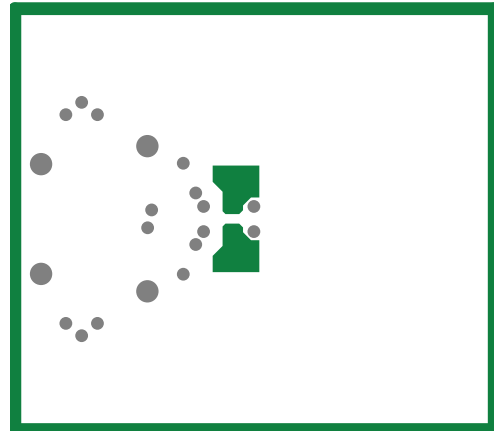


Figure 6-2. PCB Ground Layer

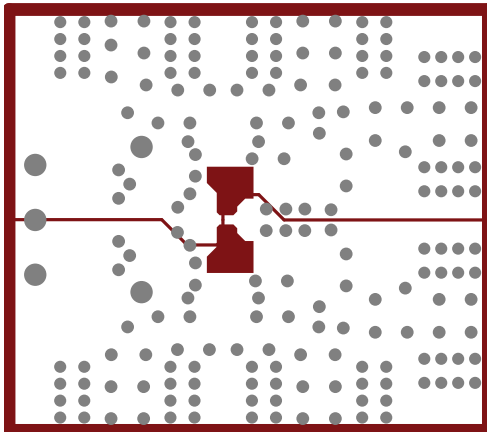


Figure 6-3. PCB Power Layer

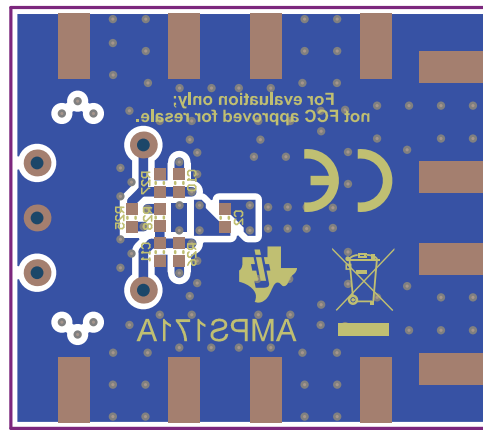


Figure 6-4. PCB Bottom Layers

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page

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