



ABSTRACT

The DEM-OPA-DTK-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 single channel amplifier products offered in the 8-pin SON (DTK and DRG) packages. The board is designed to accommodate multiple amplifier configurations to allow for maximum flexibility and ease of use.

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Trademarks

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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 Connections

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

3 Operating Modes

3.1 Single-Supply Operation

To operate as single supply, connect both the VEE and GND connector to ground and apply the positive-supply voltage to VCC. In this configuration, a populated R7 resistor can present a static DC load to ground for the amplifier as it is not referenced to mid-supply in the single-supply configuration. Additionally, the input resistors R6 and R9 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 Configuration

To operate as split supply, apply the positive-supply voltage to VCC, negative-supply voltage to VEE, and the ground reference from supply to GND. In this mode the load resistor R7 and input resistors R6 and R9 are referenced to the mid-supply potential of ground.

4 Input and Output Configurations

The DEM-OPA-DTK-EVM is equipped with footprints for SMA connectors for connection of signal generators and analysis equipment. For best results, the input and output 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. IN+ (J5) includes termination resistor R9 for non-inverting configurations. For inverting configurations an resistor network (R4, R6, and R10) is included to match the input impedance while maintaining a desired gain resistor value. VOUT (J4) is the output connectors for the amplifier. A resistor network (R5, R7, and R11) at the output of the amplifier can be used to convert the signal to 50-Ω single-ended source while providing a larger total load to the amplifier when terminated with 50-Ω load at J4.

Figure 6-1 shows the inputs and output configured in a typical unity-gain amplifier configuration with a single series output load resistor of 49.9-Ω to directly match 50-Ω test equipment.

5 Differences Between DTK and DRG Packages

The DEM-OPA-DTK-EVM board can be used with either of Texas Instruments 8-pin SON packages marked DTK or DRG. By default the board is design with the DTK package footprint, but it is also compatible with the DRG, which has a larger thermal pad than the DTK package. When using either package, the thermal pad solder amount should match the footprint on the board even if using the DRG package with the larger thermal pad footprint. In the case of the DRG package, the solder on the board will simply connect within the bounds of the larger thermal pad located on the device. It is important not to add extra solder to the thermal pad connection when using the DRG package as it could create short circuits under the package between the pins and the thermal pad.

6 Schematic

Figure 6-1 shows an example non-inverting unity-gain schematic configuration for the DEM-OPA-DTK-EVM.

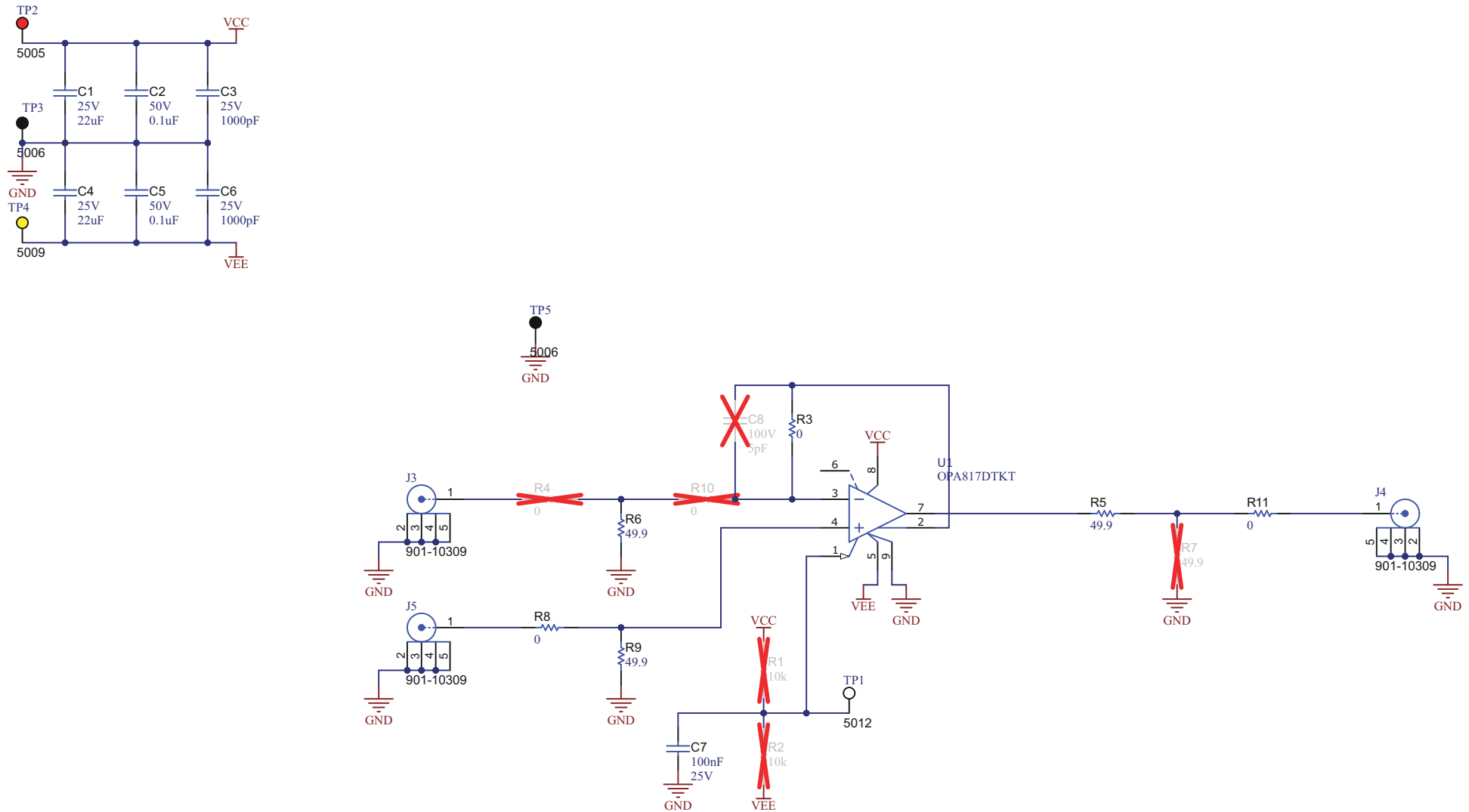


Figure 6-1. Schematic

7 Layout

Figure 7-1 through Figure 7-4 show the PCB layers of the DEM-OPA-DTK-EVM.

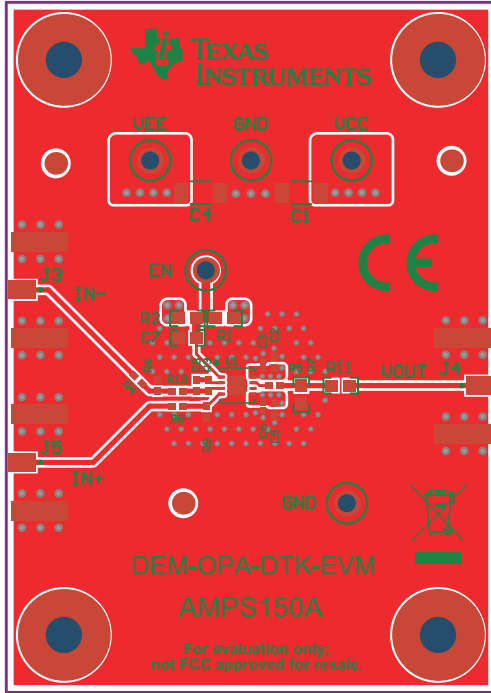


Figure 7-1. Top Layers

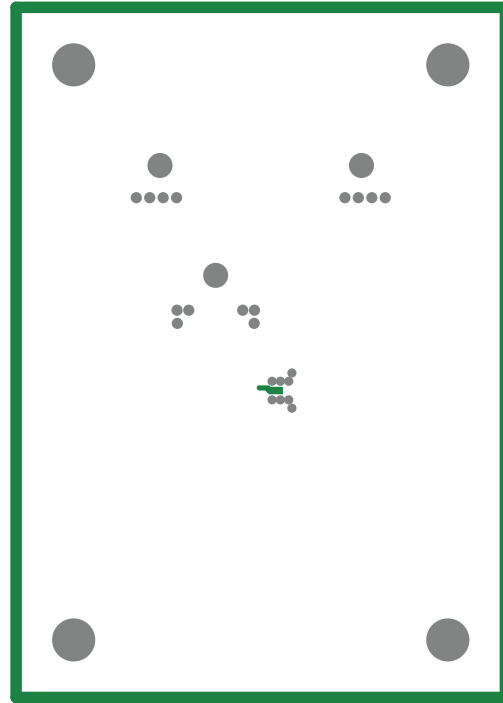


Figure 7-2. Ground Layer

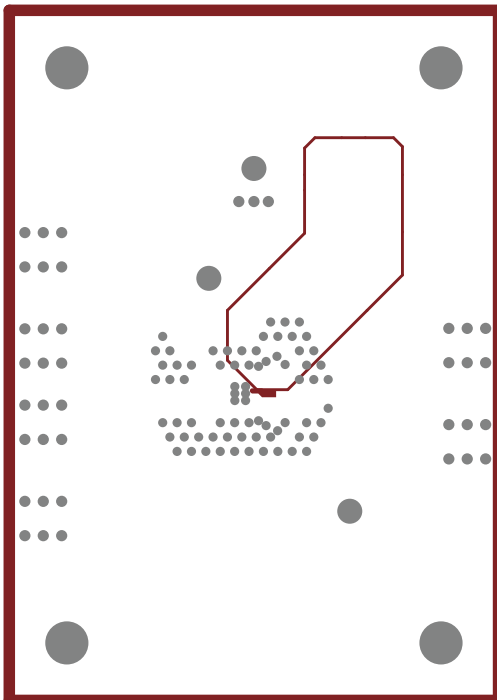


Figure 7-3. Power Layer

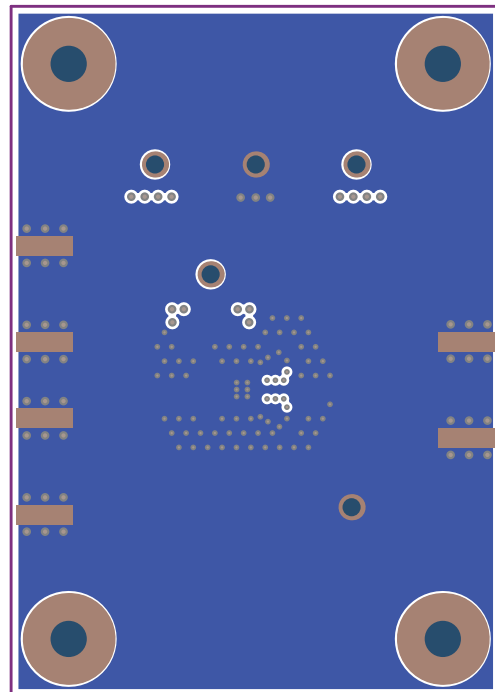


Figure 7-4. Bottom Layers

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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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3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247

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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.

Concernant les EVMs avec appareils radio:

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Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

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

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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