PowerAmp Design

EVALUATION KIT FOR PAD183 — EVAL183

Rev A

INTRODUCTION

The EVAL183 evaluation kit provides a convenient method to become familiar with the operation of the PAD183 Compact High Voltage Op Amp before your application circuit is committed to production. Some assembly is required since user selections are needed depending on the application. For example, there are several PCB mounting options available.

Critical connections for power supply bypassing and compensation are pre-wired. Connections are also provided for diode clamps on each power supply and the output for additional amplifier protection. Terminal strips are provided for input and output signals and power.

Assembled EVAL183 with PAD183 installed.

ASSEMBLY STEPS

Please note that the #1 cause of problems for evaluation kit users is not reading and following the directions (all of them). The #2 cause of problems is poor solder joints (cold or bridging). Don't become a statistic. ✓ each step.

Refer to the Illustrated Parts List for the components mentioned in the assembly steps. Notice that the same circuit board is used for the EVAL135 and that the circuit board is marked as such. Also note that the DUT location is marked as PAD135. Although the EVAL183 uses the same circuit board as the EVAL135 there are component value differences.

☐ **1.** Notice that the printed circuit board (PCB) is labeled on one side as the "DUT SIDE" and the other side as "CIRCUIT" side.

☐ **2.** As shown in the illustrated parts list, cage jack strips were used to provide you with this assembled evaluation kit. The carrier strips left over from the assembly have been included with the kit and can be cut to length and used as sockets for the components you will use to complete your application circuit. You can solder these sockets at the input locations for the PAD183 and other locations as desired. This can save soldering and unsoldering components as the needs of your application circuit change.

☐ **3**. D3 and D5 are transient voltage suppressor diodes and are not supplied since the type (breakdown voltage) varies with the application. They are not necessary for every application. They are most commonly used in application circuits where kickback from the load may force the supply voltage above the limits of the amplifier.

☐ **4.** The evaluation kit PCB can be mounted in several ways: **Option 1- Chassis mount.** Use #6 standoffs and screws (not supplied) attached to the PCB at the four corners of the PCB.
Option 2- Bench-top mount. Use the five rubber bumpers supplied. These are "stick-on" components. Remove the release paper from each bumper and apply the bumper to the square outlines on the "CIRCUIT SIDE" of the PCB.
Option 3- DIN rail mount. The PCB can be mounted to a 35mm DIN rail. For mounting the PCB to a DIN rail press the adaptors into the PCB in the holes at the edges of the PCB at locations 1 and 2 from the "CIRCUIT SIDE" of the PCB. Make sure that the plastic tines have fully spread out on the "DUT SIDE" of the PCB.

☐ **5.** Remove the 4 hex nuts from the mounting spacers of the PAD183.

☐ **6.** Align the 4 studs of the mounting spacers with the mounting holes in the PCB. Be sure that the amplifier's pin 1 aligns with pin 1 on the PCB. Slowly lower the amplifier into the PCB, making sure that the pins of the amplifier and the cage jacks mate. Push the amplifier into the PCB until the mounting spacers meet the PCB.

☐ **7.** Fasten the amplifier to the PCB with the 4 hex nuts previously removed. Do not over-tighten the nuts as this may strip the mounting studs. The provided plastic nut starter can assist you here.

☐ **8.** If necessary, strip 1/8" of insulation from the wires connected to the fan. Twist and tin the wire ends. Insert the red wire into the cage jack labeled "+" at the location marked "FAN" on the PCB. Likewise insert the blue or black wire into the cage jack labeled "—" at the location marked "FAN". Do not solder the wires into the sockets.

☐ **9.** Use the bread-boarding area near pin 14 on the PCB to add the external components necessary to program the amplifier gain and other circuit requirements to evaluate your application circuit. You can use the evaluation kit schematic and PCB views to map out your circuit.

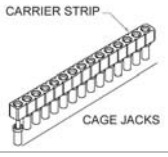
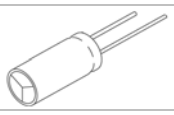
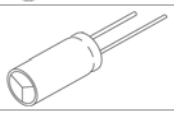
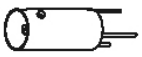
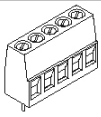
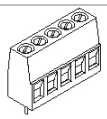
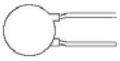
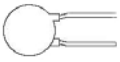
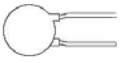
☐ **10.** Remember that the PAD183 must be compensated to operate correctly. See the PAD183 datasheet on Page 4, under PHASE COMPENSATION. The selected phase compensation capacitor will be installed at "C_C" on the evaluation kit PCB. A 47pF capacitor has already been installed in your kit. Another value may better suit your application. Remove and replace the capacitor as necessary for your application. 22pF and 150pF capacitors are also included with the kit. C_C must be rated for at least 350V. A temperature stable type capacitor is required—an X7R ceramic, for example, or an NPO type (preferably).

☐ **11.** The evaluation kit assembly is complete. Be sure you have read and followed all the assembly steps. Inspect the circuit board for solder shorts or poor solder joints. An illuminated magnifier is helpful.

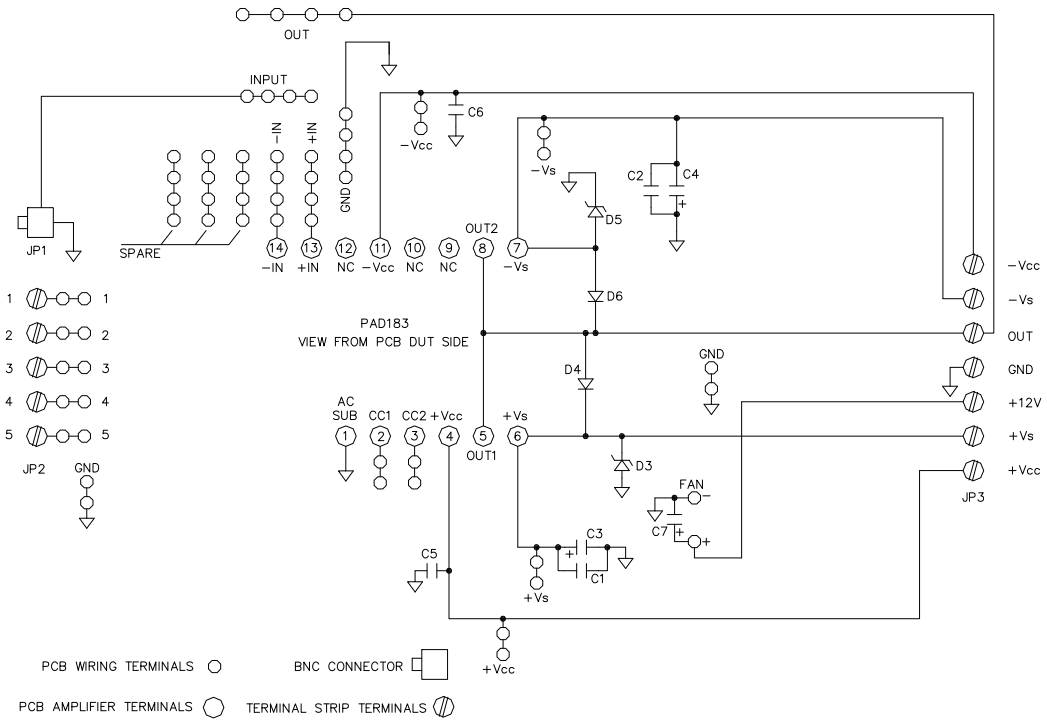
☐ **12. Before applying power to your circuit set the power supply for ±20V and set the power supply current limit to approximately 100mA. Use little or no load at first. Apply an input signal and check the output with an oscilloscope to verify proper functionality. This step can prevent damaging the amplifier or the circuit board should there be some mistake in assembly.**

EVAL183 EVALUATION KIT FOR PAD183 AMPLIFIER ILLUSTRATED PARTS LIST

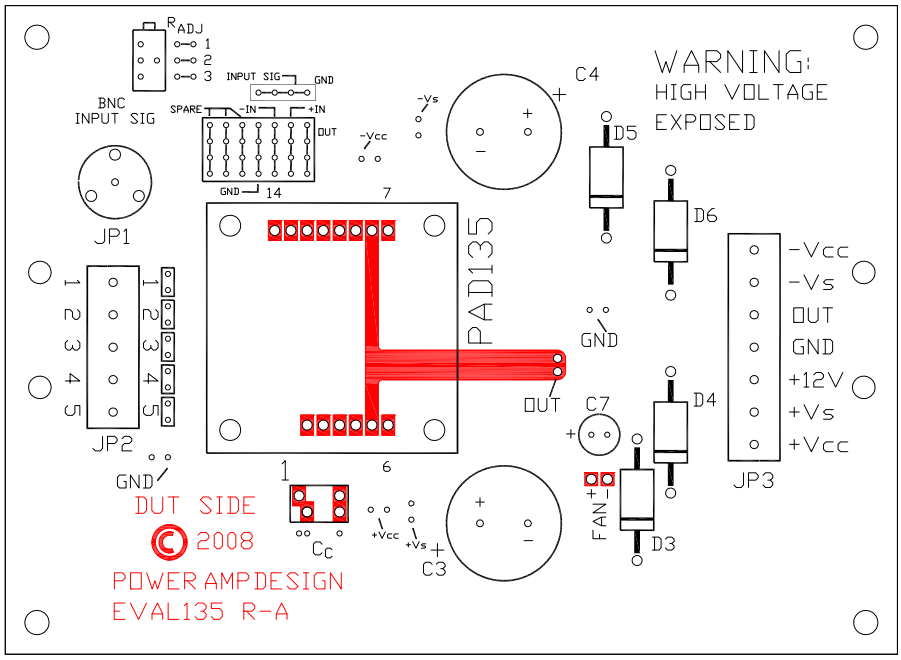
Note that the PAD183 is purchased separately.

✓	Ref	Qty	Description	Mfg/Distributor	Mfg. Part Number	Illustration (not to scale)
☐	Amplifier Pins 1-22 + TPs	1	Cage Jacks w/carrier strip 32 wide	Power Amp Design	CJS01	
☐	C1,2,5,6	4	Chip Capacitor, 0.2µF, 500V	Novacap	1825B204M501NT	
☐	C3, 4	2	Electrolytic Capacitor, 100µF, 350V	Panasonic/Digi-Key	EEU-EB2V101	
☐	C7	1	Electrolytic Capacitor, 47µF, 35V	Panasonic/Digi-Key	EEU-FC1V470	
☐	JP1	1	BNC Jack	AMP/Digi-Key	5221123-2	
☐	JP2	1	Terminal Block, 5 position	Phoenix/Digi-Key	1729157	
☐	JP3	1	Terminal Block, 7 position	Phoenix/Digi-Key	1729173	
☐	Cc	1	Capacitor, 47pF	Vishay/Mouser	561R10TSQ47	
☐	Cc	1	Capacitor, 22pF	Vishay/Mouser	561R10TCCQ22	
☐	Cc	1	Capacitor, 150pF	Vishay/Mouser	561R10TCCT15	
☐	D4, 6	2	Diode, Fast Recovery	ON Semi/Digi-Key	MUR460RL	
☐	NA	5	Rubber Bumper	3M/Digi-Key	SJ5518	
☐	NA	1	Nut Starter	Menda/Jensen Tool	200	
☐	NA	2	35mm DIN Rail Adaptor	Scidyne	121-0014	
☐	NA	1	PCB	Power Amp Design	EVAL135	NA

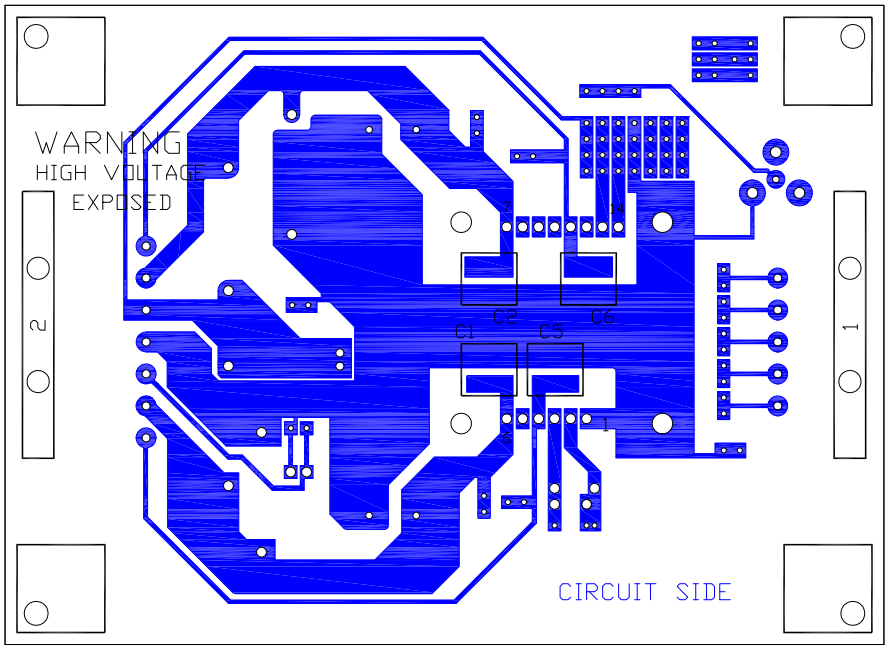
CIRCUIT DIAGRAM



TOP VIEW



BOTTOM VIEW



ASSEMBLED EVAL183

BOARD OUTLINE DIMENSIONS