EK87

Evaluation Kit

APPLICABLE PARTS

- PA166PQ

INTRODUCTION

This kit contains everything needed for rapid prototyping with the PA166 Operational Amplifier. The EK87 offers versatility when it comes to connecting inputs, measuring outputs, and conditioning signals to the specific application environment. An additional prototyping area makes it possible to analyze a multitude of standard or proprietary circuit configurations. On board temperature sensing terminals allow for real time output stage junction temperature monitoring. EK8763 also provides flexibility for modifying the gain, in inverting or non-inverting mode as well as an optional Improved Howland Current Pump configuration feature.

Figure 1: Circuit Diagram (Main PCB/EVAL166)

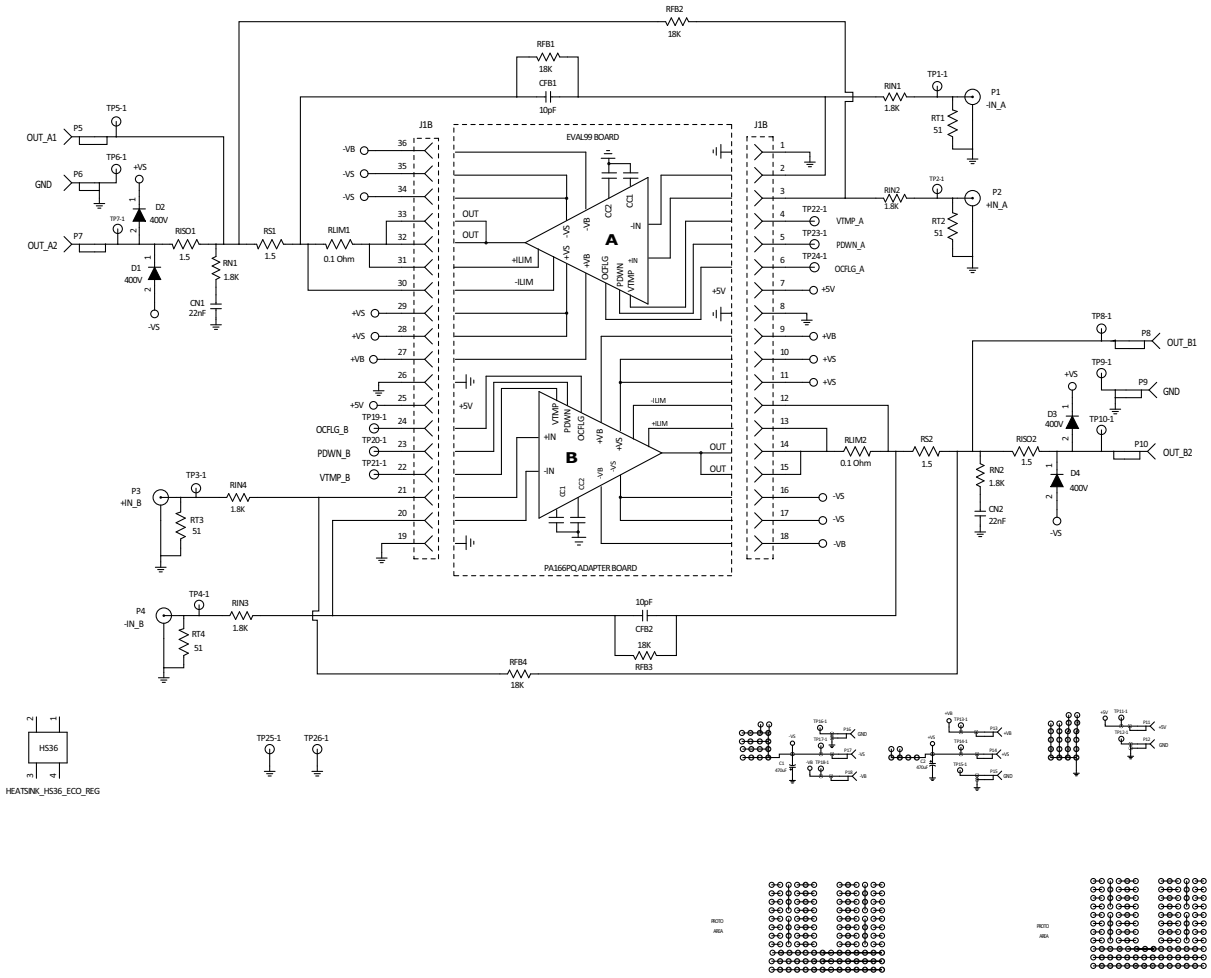
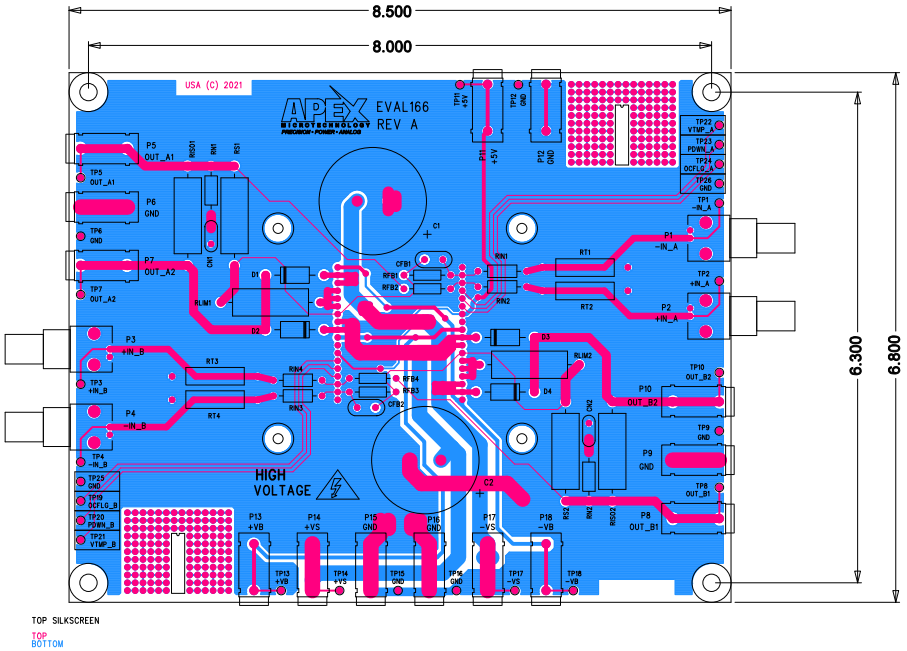
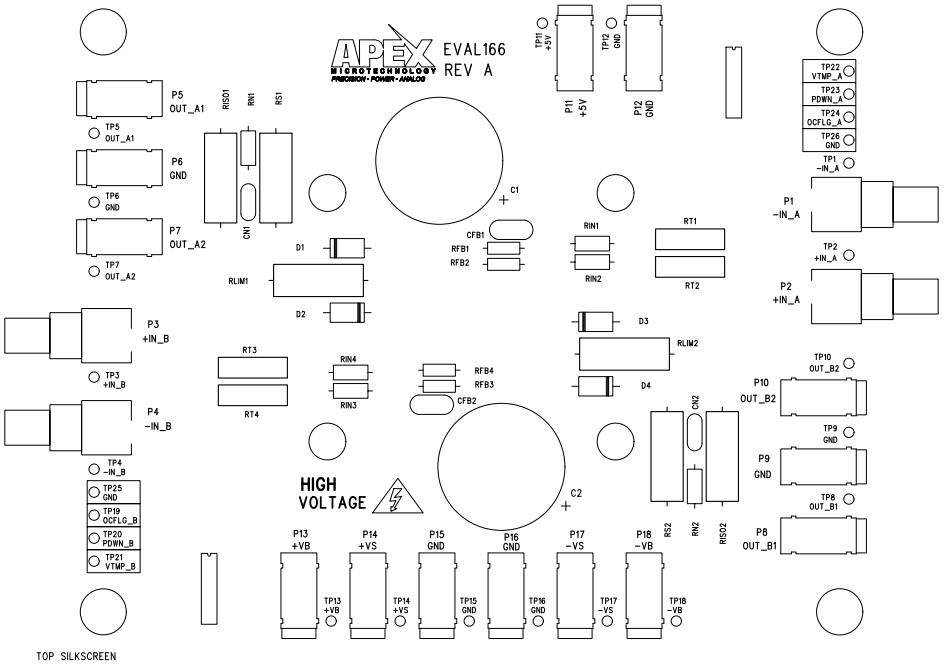


Figure 2: PCB Layout

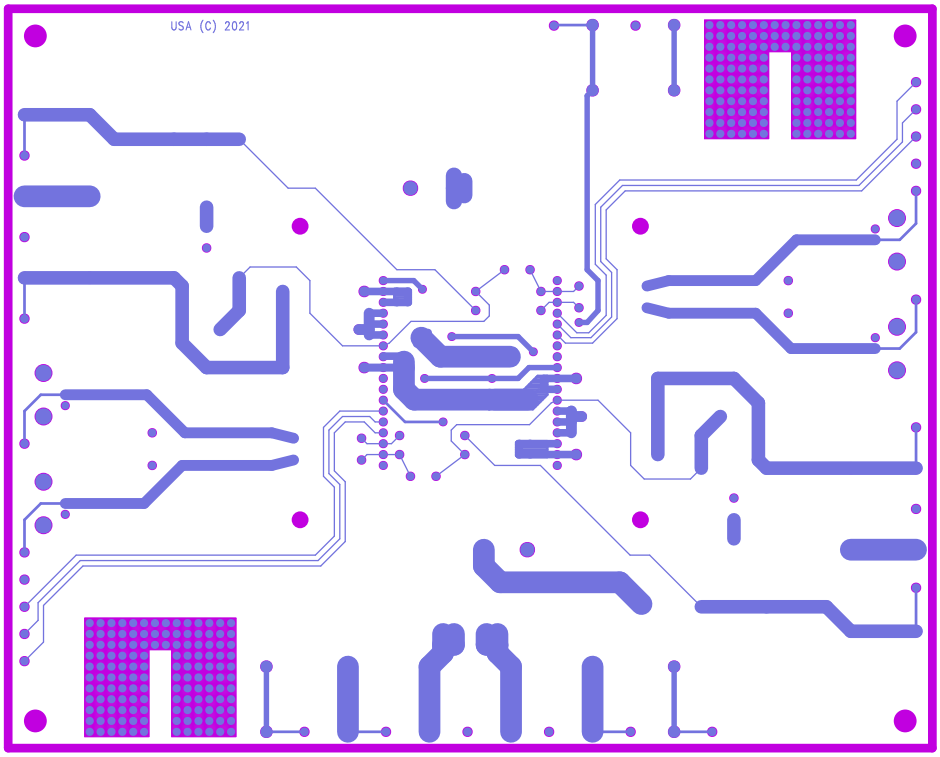
Composite



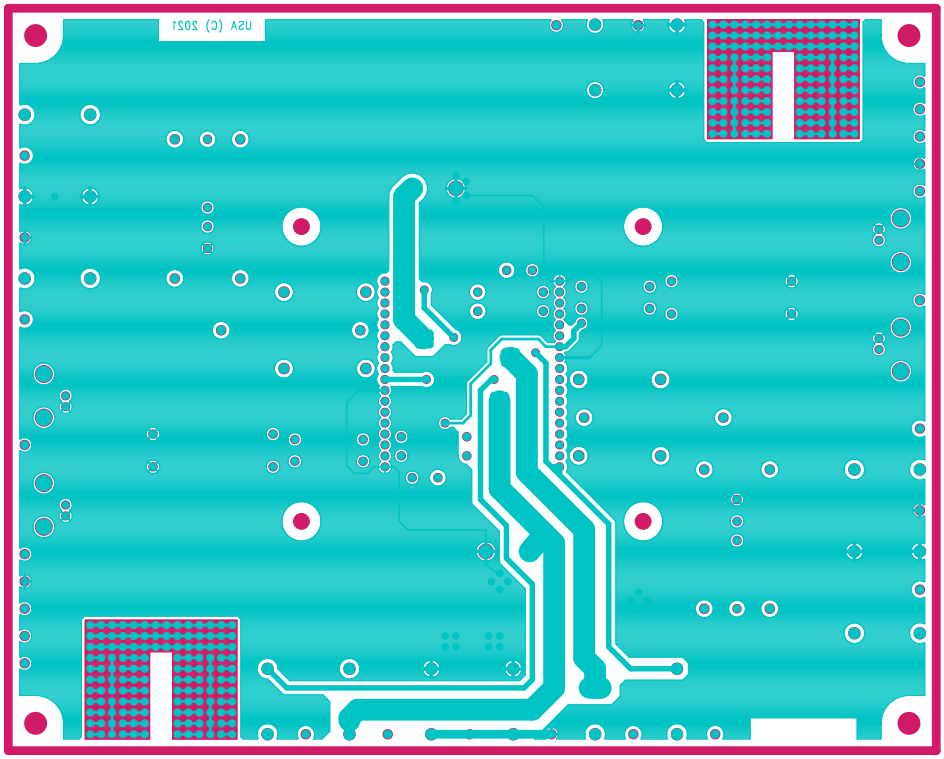
Component Side (Top Side)



Top Metal Layer



Bottom Metal Layer

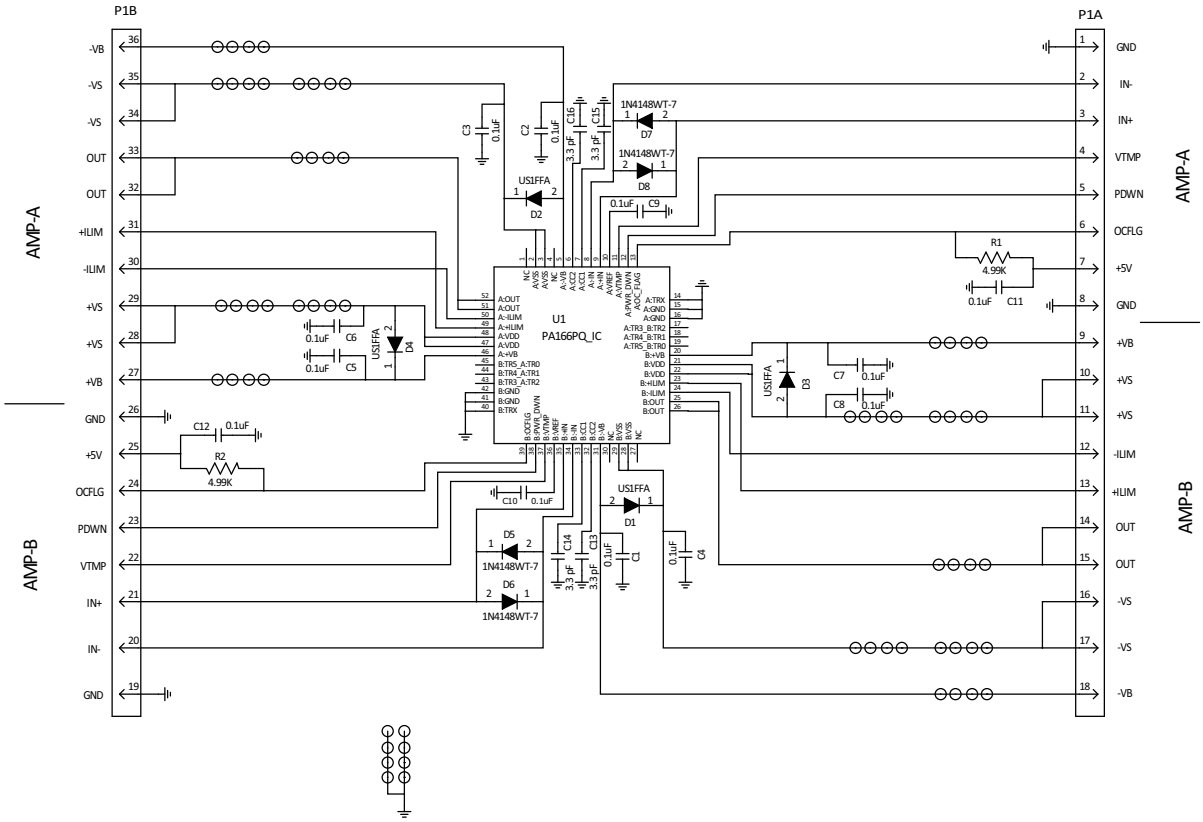


PARTS LIST

Reference	Manufacturer Part #	Description	QTY
Printed Circuit Board			
EVAL166	EVAL166	Printed Circuit Board (Main)	1
EVAL99	EVAL99	Printed Circuit Board (Daugh.)	1
Resistors			
RT1-RT4	PR03000205109JAC0	51Ω, 3W, 5%	4
RFB1-RFB4	CF12JT18K0	18kΩ, 1/2W, 1%	4
RIN1-RIN4	RN60D1801FB14	18kΩ, 1/4W, 1%	4
RISO1-RISO2	ERX-5SJ1R5	1.5 Ω, 5W, Metal Film	2
RLIM1-RLIM2	15FR100E	0.1 Ω, 5W, Metal	2
R1, R2**	RC1206FR-074K99L	4.99kΩ, 1/4W, 1%	2
Capacitors			
C1, C2	KMH450VN471M35X50T2	470µF, 450V Electrolytic Cap	2
C1-C12**	C1210C104KCRACTU	CAP, 0.1 µF, 500V, 1210	12
C13-C16**	C0805C339KCGACTU	CAP, 0.1 µF, 500V, 0805	4
Diodes			
D1-D4	MUR440RLG	Diode fast recovery 400V 4A	4
D1-D4	US1FFA	300V, 1A, fast recovery diode	2
D5-D8	1N4148WT-7	75V, 10mA Diode	4
Hardware			
P1A, P1B**	TSM-118-01-T-SV	CONN Header SMD 18-Pos	2
U1**	PA166PQ	Dual Power Amp 200V 5A	1
P1-P4	227661-1	BNC JACK R/A 50 OHM PCB	4
P5-P18	571-0100	4MM SOCKET/BANANA JACK_BLACK	14
J1A, J1B	SSW-118-01-T-S	CONN, RCPT 18POS 0.1 TIN PCB	2
TP1-TP26	5001	Test Point, PC Mini	26
HS36	HS36	Apex Heatsink HS36	1
Item1	911-125	Spacer between heatsink and mini board	4
Item 2	2221	Standoff, Hex, #8 X 2.00”	4
Item 3	91249A126	Screw, Panhead, 4-40, 1.5”	4
Item 4	91735A190	Screw, Panhead, #8, 0.25”	4
Item 5	94758A101	Accessory, Bolt, 4-40, TH	4

** Components associated with Daughter card PCB

Figure 3: Circuit Diagram (Daughter card PCB (EVAL99))



BEFORE YOU GET STARTED

- All Apex Microtechnology amplifiers should be handled using proper ESD precautions.
- Always use the heat sink included in this kit.
- Always use adequate power supply bypassing.
- Do not change the connections while the circuit is powered.
- Initially set all power supplies to the minimum operations levels allowed in the device data sheet.
- Check for oscillations.
- Please refer to Application Note, AN01 for general operating conditions.

ASSEMBLY INSTRUCTIONS

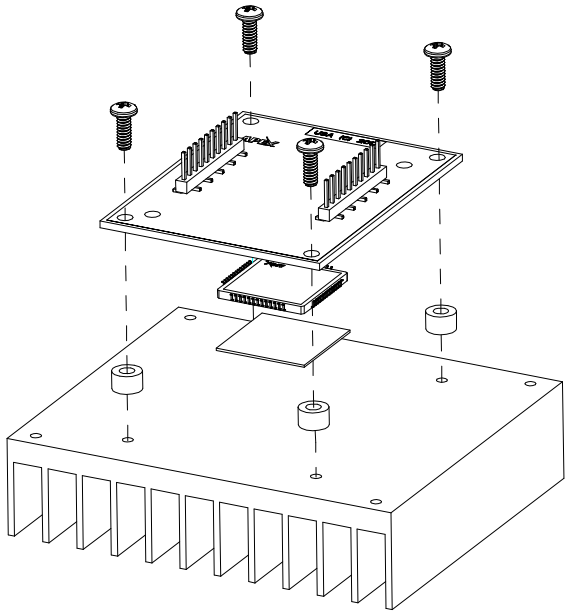
During the assembly, please refer to the circuit schematics, assembly drawings, and the data sheet of the part being used on the evaluation kit.

1. Note, a pre-assembled EK88-1 daughter board is provided which contains the PA166 power amplifier and a heat-sink attached to it.
2. All the supplied components are to be mounted on the component side the EVAL 166 board, except the 18 pin sockets. Mount the two 18 pin sockets on the DUT side of the board.
3. After the sockets have been soldered, solder smaller components like resistors, capacitors, and diodes on the component side of the board, leaving the largest components C1 and C2 for last.
4. Components for Inverting and non-inverting circuit configurations are provided along with some added components for protection. All components should be soldered on EVAL 166 PC board on the component side making sure that the smallest profile components are installed first. Ensure that the orientation of the capacitors C1 and C2 match the circuit drawing.
5. To use the amplifiers in a simple inverting or non-inverting configuration, short the RS resistor with a bus wire. The RS resistor should only be used when using the amplifiers in a Howland current pump configuration.
6. Mount the BNC connectors, Banana jack connectors and test points on the component side of EVAL166.
7. Once all the components are mounted on EVAL 166, mount on the EK88-1 into the socket on EVAL 166 on the DUT side.
8. After mounting the EK88-1 on EVAL 166, use 91249A126 (4-40 thread, 1.5” long) screws through EVAL166 to hold the EK88-1 board. 4-40 flange nuts are provided for these screws.
9. Hex standoffs are also provided with the kit. Install the #8 x 0.25” screws (91735A190), provided with the kit, from the component side. Attach the standoffs to these screws on the corner of the board.

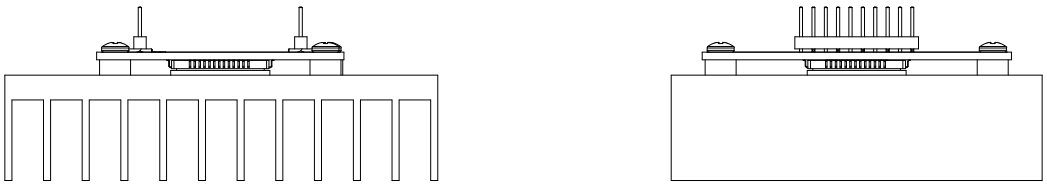
HEATSINK MOUNTING / PART MATING GUIDELINES

The DUT (device under test), in this case the PA166PQ uses HS36 as the Heatsink.

FIGURE 3
Top View



Side View(s)



TEST ASSEMBLY

EQUIPMENT NEEDED

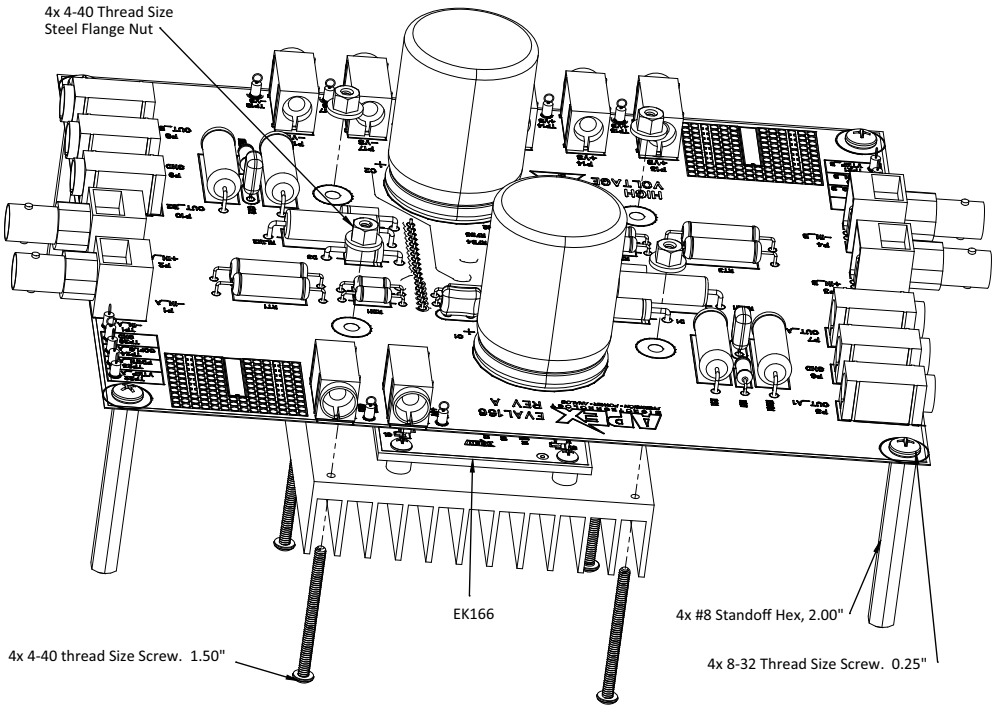
1. Power Supplies
2. Digital Multimeter
3. Oscilloscope
4. Proper Device Heatsinking

TEST SETUP

Connect the power supply to +VS and -Vs ports. If you wish to use boost supply, connect boost voltage supplies to +VB and -VB ports. Otherwise, short +VS to +VB and -VS to -VB. Refer to product data sheet for voltage specifications. Connect the BNC cable from the function generator to either P1 or P4 port for inverting configuration or to P2 or P3 for non-inverting configuration. Connect a 5V DC supply to P16 port for over current flag.

Do not plug in EK88-1 board yet. First power on the input signal and power supplies. Measure voltages on all pins on J1A and J1B on the DUT side to ensure that there is no short and to check if all the pins read correct voltages.

Now, mount the EK88-1 on EVAL 166. If connecting a resistor load, connect between ports P11 and P10. if a snubber circuit is connected, connect a reactive load between P12 and P10. Input and output waveforms can be checked on an Oscilloscope by connecting it to the test points mounted on the board. Begin the test with minimum values of input and supply voltages.



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