

**INTRODUCTION**

This easy-to-use kit provides a platform for the evaluation of PWM amplifiers using the SA12 pin-out configuration. It can be used to analyze a multitude of standard or proprietary circuit configurations, and is flexible enough to do most standard amplifier test configurations.

The schematic is shown in Figure 3. Note that all of the components shown on the schematic will probably not be used for any single circuit. Some components will simply be omitted, while others require installation of a jumper to complete the signal path.

Only components unique to the EK17 are provided in this kit. Hardware similar to that shown in Figure 1 must be obtained locally.

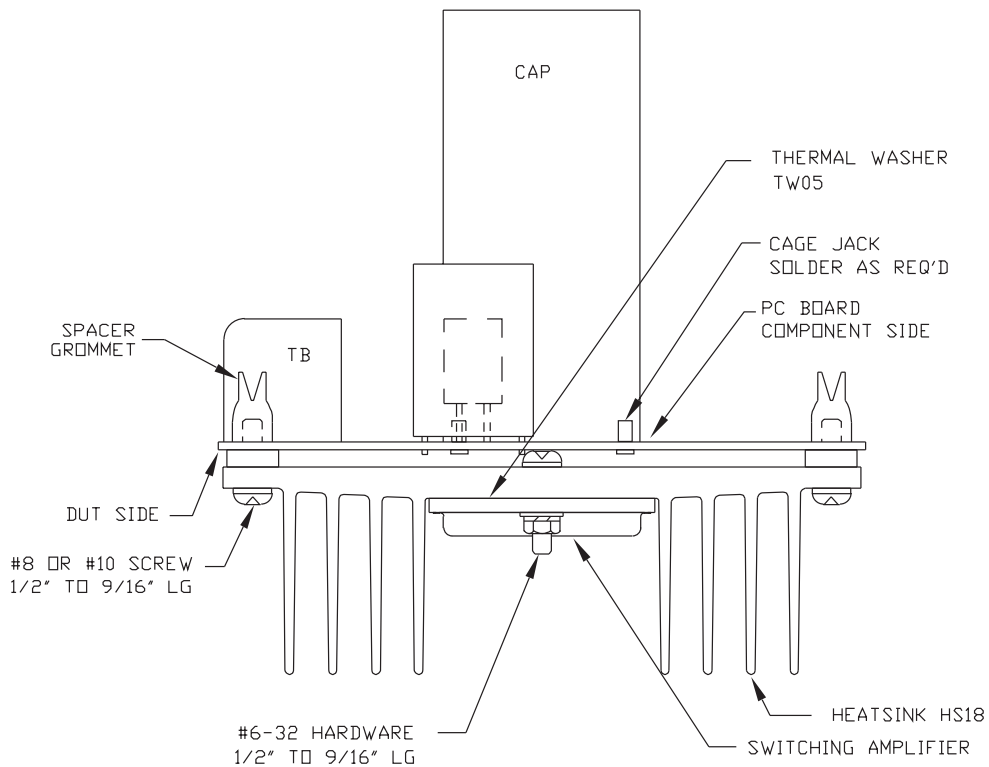
**BEFORE YOU GET STARTED**

- \* All Apex amplifiers should be handled using proper ESD precautions.
- \* Always use the heatsink included in this kit with TW05 washer.
- \* Always use adequate power supply bypassing.
- \* Do not change connections while the circuit is powered.
- \* Initially set all power supplies to the minimum operating allowed in the device data sheet.

**PARTS LIST**

Apex Part #	Description	Quantity
HS18	Heatsink	1
MS04	PC mount Cage Jacks	1 Bag/12 each
EVAL19	PC Board	1
60SPG00001	Spacer Grommets	4
TW05	Thermal Washer	1 Box/10 each
OX7R105KWN	1µF Cap 1825B105K201N, Novacap	3
TS01	Terminal Strip 66505 Beau Interconnect	1
EC03	680 µf Cap United Chemi-Con KMH200VN68IM25X40T2	1
HS22	Heatsink Thermolly 6025B	2
CSR03	0.01 ohm resistor Caddock MP916-0.010 - 5%	2
CSR04	0.020 ohm resistor Caddock MP930-0.020 - 5%	2

FIGURE 1.



## ASSEMBLY

During assembly refer to Figures 1 & 2

1. From the DUT of the PCB insert and solder the 12 cage jacks. Also solder the cage jacks from the circuit side as well, making sure the cage jack remains flush with the component side of the PCB.
2. Solder the 3 surface mount ceramic capacitors to the component side of the PCB.
3. From the component side of the PCB insert the terminal strip. Solder from the circuit side of the PCB. Be sure that the GND terminal hole in the PCB is fully filled with solder.
4. Two values of current limiting power resistors are supplied. Select one value (see the amplifier data sheet to learn how to calculate which resistor will suit your need). Coat the backside of the power resistor with heat sink compound (not supplied). Using 4-40 screws and nuts (not supplied) mount the resistors to the two small heat sinks supplied. Solder the resistor/heat sink assembly to the component side of the PCB.
5. Insert the electrolytic capacitor into the PCB from the component side and solder from the circuit side making sure to fill the mounting holes with solder.
6. From the circuit side, push spacer grommets into PCB until fully seated. Grommets will snug when screws are inserted for heatsink mounting.
7. Apply TW05 thermal washer to the bottom of the amplifier.
8. Use #14 sleeving to insulate and align at least 2 opposite pins of the amplifier.
9. Mount amplifier to heatsink using #6 screws and nuts. Torque the part to the specified 8 to 10 in-lbs (.9 to 1.13 N\*M). Do not over torque.
10. Install components as needed. External connections may be soldered directly or standard banana jacks may be soldered to the large pads at the edge of the PCB.
11. Insert amplifier pins into cage jacks and fasten PCB to heatsink.

FIGURE 2. PCB

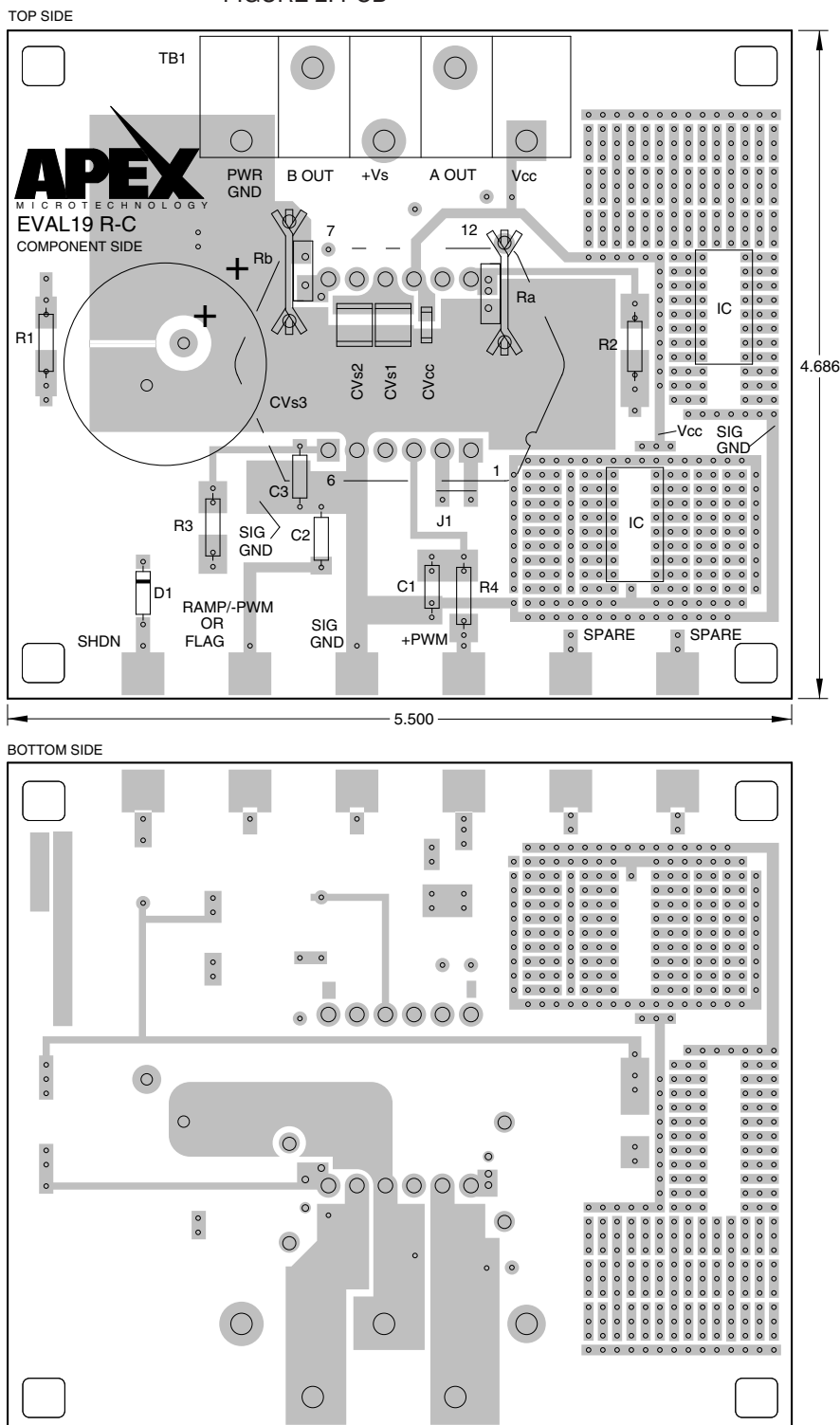
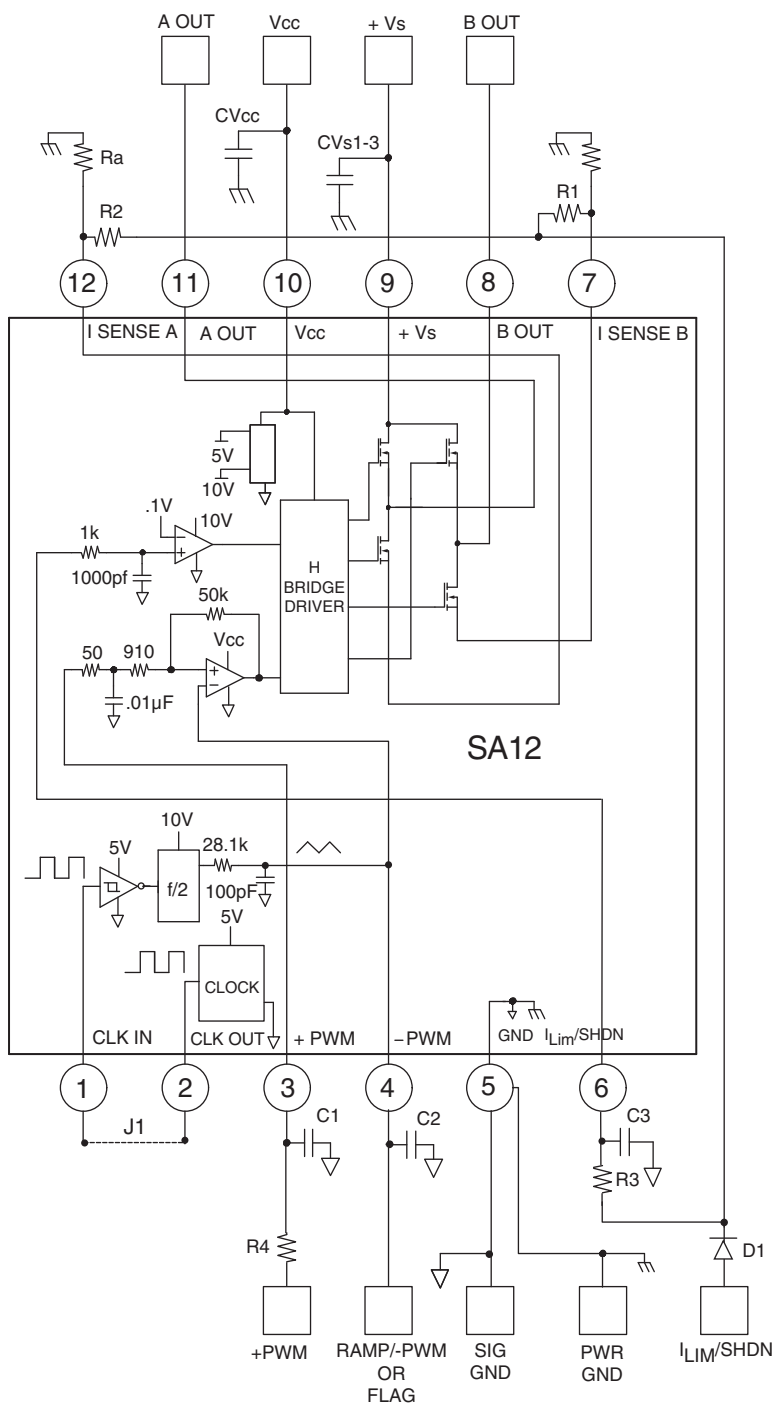
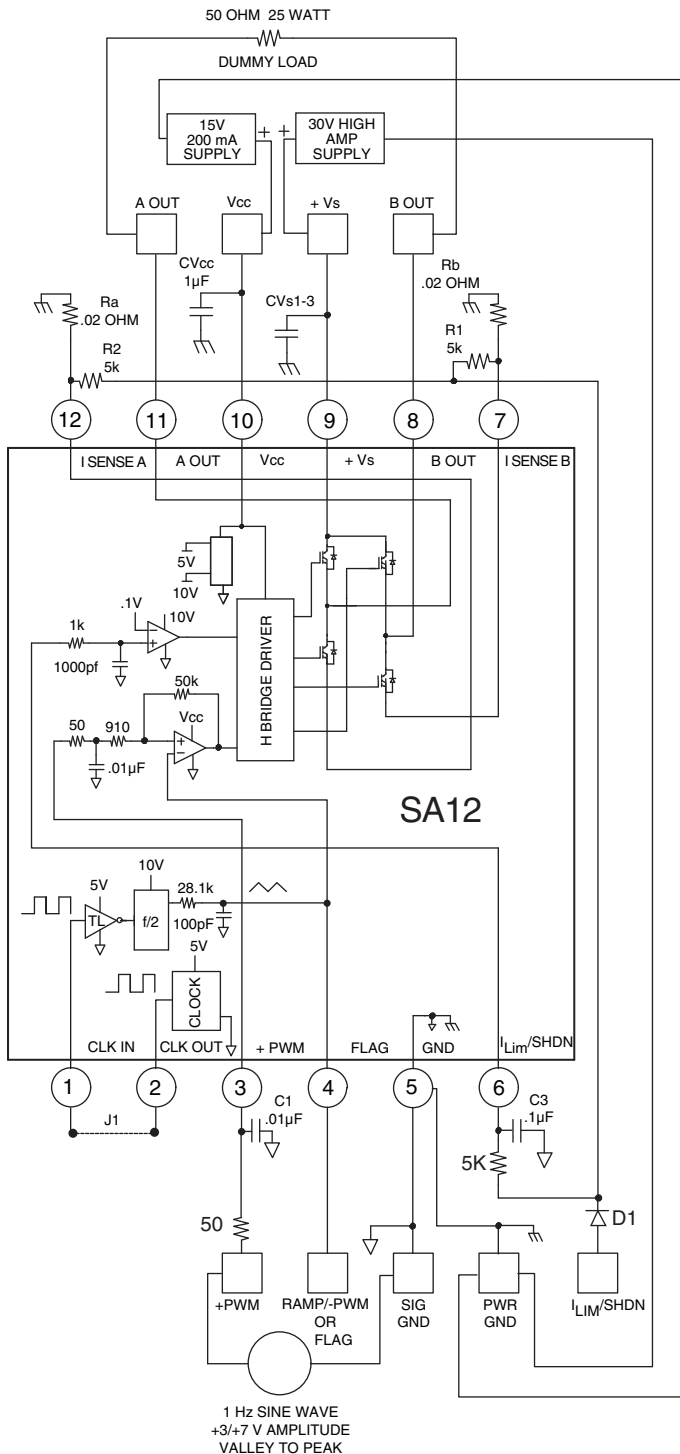


FIGURE 3. PCB SCHEMATIC.



A block diagram of the SA12 is shown in Figure 3 along with pcb connections of all the commonly used external components. Your application circuit will not use all of the components. Add those components required by your circuit. You may have to jumper some components to make the desired electrical connections. J1 is an optional way to connect the clock circuit. Power supply bypassing is particularly important and that is why high quality ceramic chip capacitors are supplied with the kit. In addition, a large electrolytic capacitor is included. This capacitor was selected expressly for this evaluation kit and may not be (and likely won't be) suitable for your end application. You will need to select an electrolytic capacitor based on your analysis of the capacitor's ripple current, ripple current tolerance, operating temperature, operating voltage, acceptable service life and acceptable supply ripple. Note that the signal ground and power ground are separated and tie together only at the ground pin (5). A breadboarding area is supplied which can accommodate 1 or 2 IC amplifiers and associated components. The large terminal pads can be used to solder wire connections or banana jacks.

FIGURE 4. FUNCTIONAL TEST CIRCUIT



The schematic of Figure 4 can be used to verify the functionality of your amplifier and help you gain a familiarity with proper operation. At either A Out or B Out, with respect to ground, you should observe a square wave approximately 30 V in amplitude with a fixed frequency and duty cycle that varies from approximately 0 to 100% at a rate of 1 Hz. The current limit is set to 10 amps.