

## *Evaluation Kit for TO-3 and MO-127 Packages*

### INTRODUCTION

This kit provides a solid mechanical platform with good shielding and grounding to breadboard eight pin TO-3 packages or the MO-127 package with 0.060" pins. This kit is not intended as an alternate for kits dedicated to specific amplifiers. See [www.apexanalog.com](http://www.apexanalog.com) for availability of dedicated kits.

Construction will involve surface mounting and 3D techniques. Holes are provided to mount standard banana and BNC connectors for I/O. See the Apex Microtechnology Accessories Information data sheet for a selection of flat-back heatsinks and thermal washers for these packages.

Note that HS11 is compatible with EK09 and all three sockets can be used if desired. If the EK09 is to be used as an MO-127 platform only, HS18 rated at 1° C/W is a cost effective alternative to HS11 if internal power dissipation permits. Lower cost alternatives for two package TO-3 applications are HS02, HS01, and HS09. For single package TO-3 applications the HS13 is also suitable. The six chip capacitors provided can be used as the critical first step in power supply bypass for dual supplies for all three sockets. These capacitors are rated at 200V.

### PARTS LIST

Part #	Description	Quantity
PB99-P2	top	1
PB99- P6	side	2
PB99-P7	side	2
MS02	cage jacks for one TO-3 socket	2
MS04	cage jacks for one MO-127 socket	1
OX7R105KWN	1µF Cap 1825B105K201N,Novacap	6

### BEFORE YOU GET STARTED

- Attempt to visualize the finished circuit mechanically and in terms of where the high currents flow.
- Use proper ESD precautions.
- Verify heatsink is adequate
- Use thermal grease or Apex Microtechnology thermal washer.
- Do not make or break any connection on a hot circuit.
- Start with lowest rated voltages.
- Checking for oscillations with an oscilloscope is a must.

### ASSEMBLY

Let us define the side of the top board with solder pads for each pin (roughly triangular on the TO-3 sockets) as the component side, where all the support components will determine circuit function and will be inside the finished box. The other side of this board is hereby dubbed the amplifier side.

Insert cage jacks from the amplifier side and solder. Consider one of these techniques: 1) Place cage jacks in holes, cover with one of the 6" copper sides, flip over and solder, or 2) place cage jacks on pins of the amplifier, insert and solder. If done carefully, technique 2 can be used for the MO-127 package with 0.040" leads.

Starting with one short and one long side, locate a vertical square corner in your work area (a large heatsink standing on end works fine) and solder the two together. Repeat for the other two sides, and finally solder the two pairs together. With the component side up, place rectangle of sides on top and tack two opposite corners. When satisfied with alignment, solder the box together then add connectors and components as desired.

Note that copper on the inside and on the top of the box will all be tied to ground. Copper on the four outer sides of the box will be floating unless you tie them down.

Soldering a stranded #10 to #16 ground wire from the immediate area of the socket(s) to the ground connector of the power supply(ies) is good construction practice. If the circuit is not a bridge, run this same size wire from the socket area to the output return connector. This will avoid high currents in the ground plane which may destroy signal integrity or even an amplifier. This is a good time to think about star grounding where each ground connection has a dedicated path to the center of the star such that currents in any path are not capable of inducing voltage in any other path.

Note that the layout makes it easy to locate the star center nearly coincident with the socket center.

Auxiliary circuits may be mounted inside the box in 3-D fashion supported on ground connections or on daughter boards as convenient. Other style connectors, switches or indicators can easily be added by simply drilling the appropriate holes and mounting them.

FIGURE 1. COMPONENTS INCLUDED IN EK09.

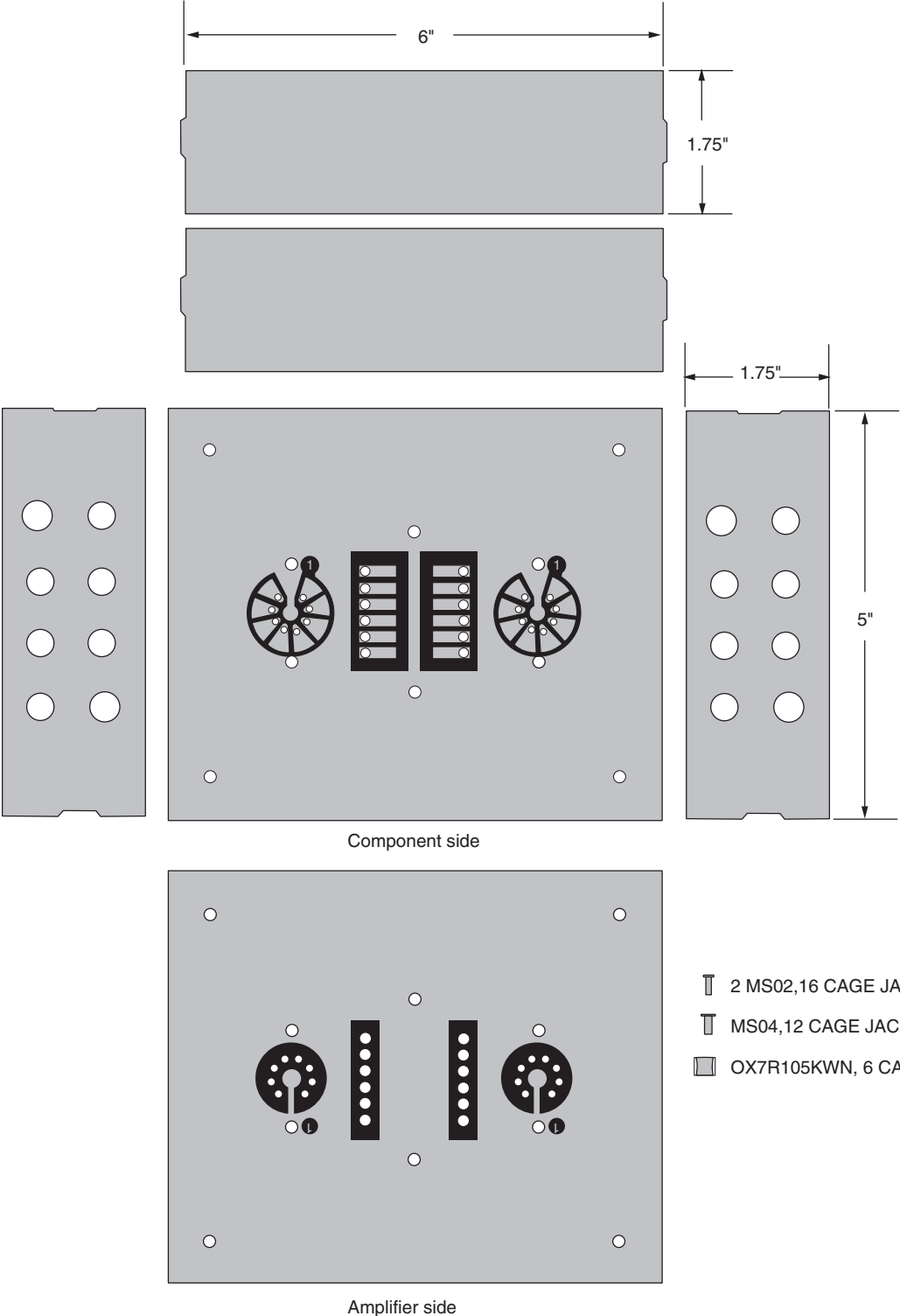


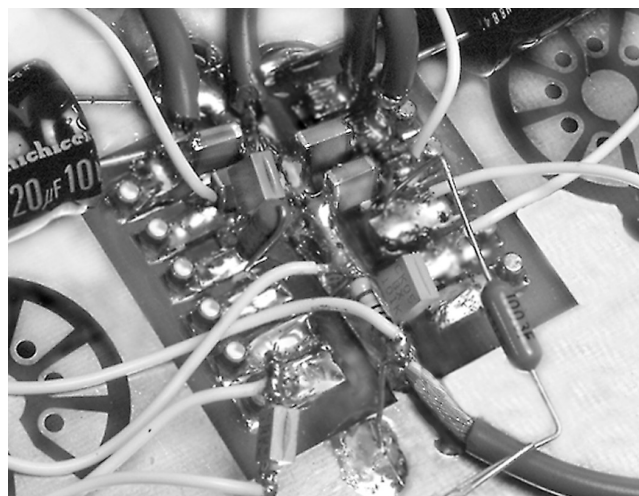


Figure 2.  
External with heatsink (heatsink, amplifier, connectors and switches not supplied).



Figure 3.  
Inside of assembled box. Holes for components on long side were user drilled.

Figure 4.  
Socket detail shows the center of the star ground system is right in the center of the socket.



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## NEED TECHNICAL HELP? CONTACT APEX SUPPORT!

For all Apex Microtechnology product questions and inquiries, call toll free 800-546-2739 in North America.

For inquiries via email, please contact [apex.support@apexanalog.com](mailto:apex.support@apexanalog.com).

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