A (Relatively) Cheap 'n Dirty Dummy Load

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This article describes a low-cost, low-to-moderate power dummy load, which presents a 50-Ohm (±1%) resistive load from HF through 440MHz. The device uses thick-film, high-power resistors from Caddock, and a heatsink liberated from a very dead PC CPU.

The resistor and heatsink are both chosen for the desired power dissipation. The parts for the dummy load illustrated in this article were chosen to provide about 25W of continuous dissipation, but they will handle 100W or RF input for shorter periods of time.

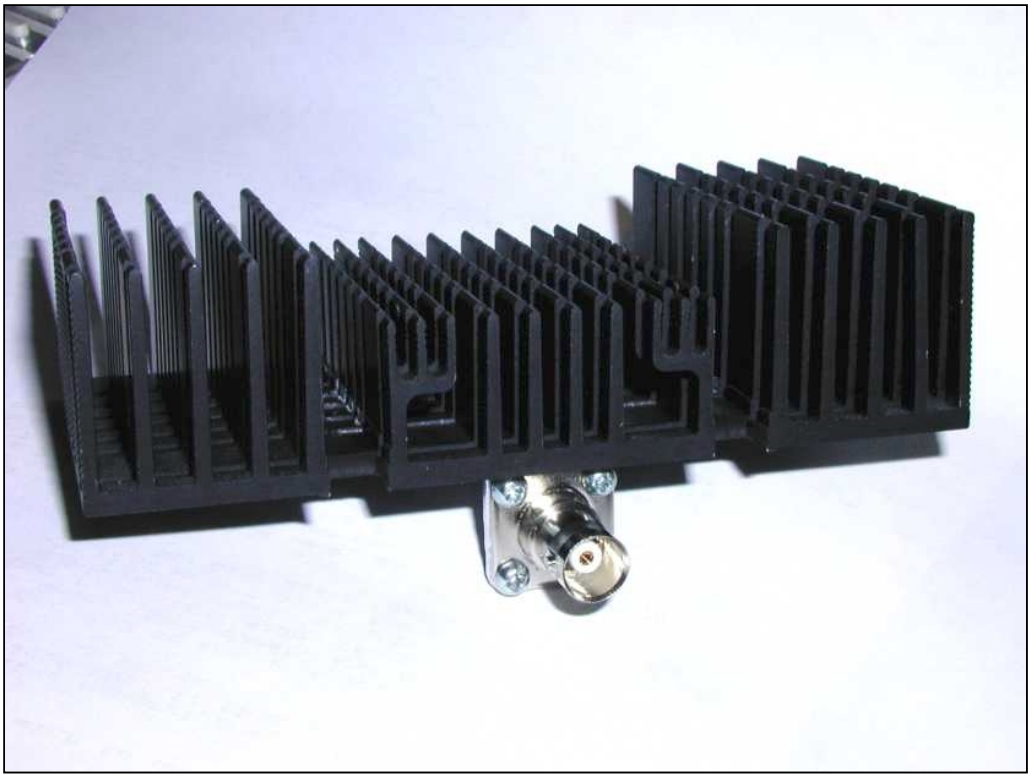


Figure 1

Figure 1 shows the heatsink and BNC input connector. I will eventually use some aluminum sheet to manufacture a cover to protect the connections on the bottom of the heatsink.

The BNC connector is attached to the bottom of the heatsink with a bracket made from a ¾" (19mm) wide piece of ¾" (19mm) aluminum L-channel. The chassis-mount BNC connector is screwed directly to the mounting bracket.

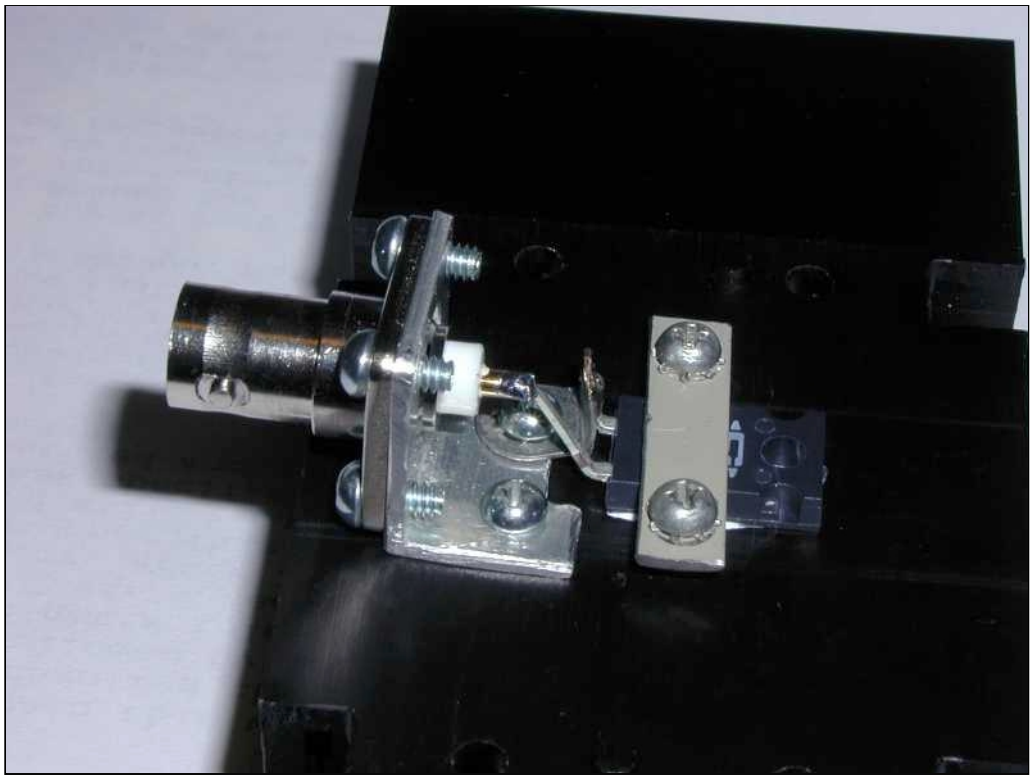
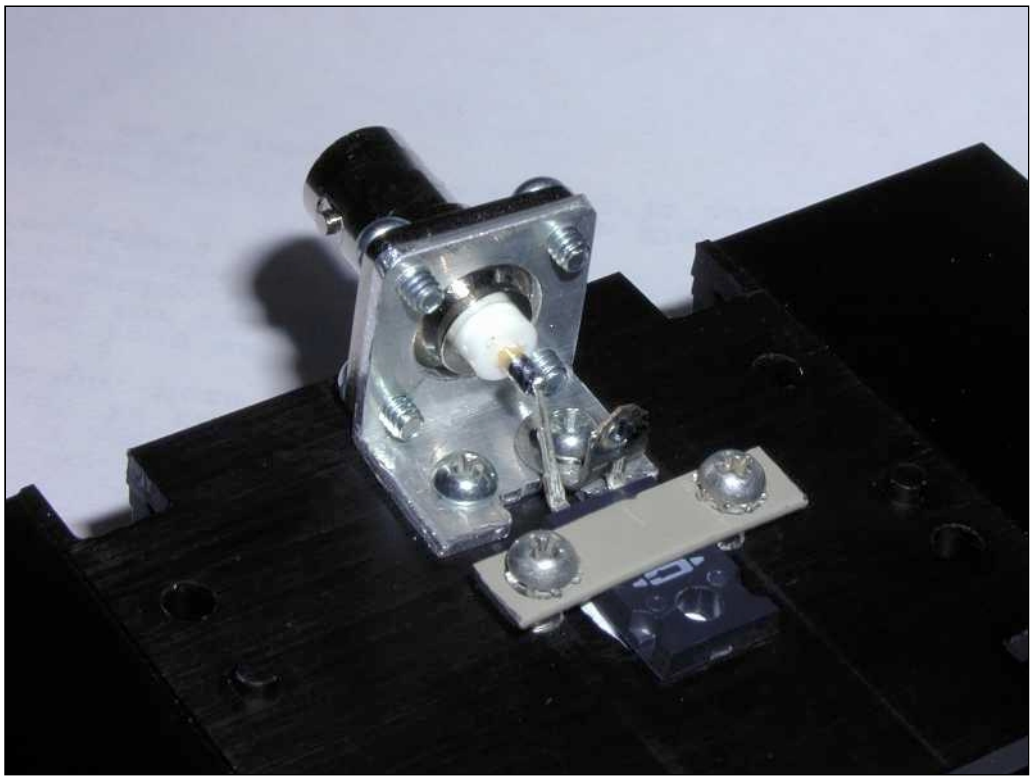


Figure 2

Figures 2 & 3 illustrate the manner in which I mounted the thick-film resistors to the heatsink, and how I connected them to the BNC connector and ground.

I chose to use a pressure bar instead of the mounting hole in the resistor for securing the resistor to the heatsink because a bar will exert more uniform pressure against the resistor body and will thus ensure a better thermal contact to the heatsink.



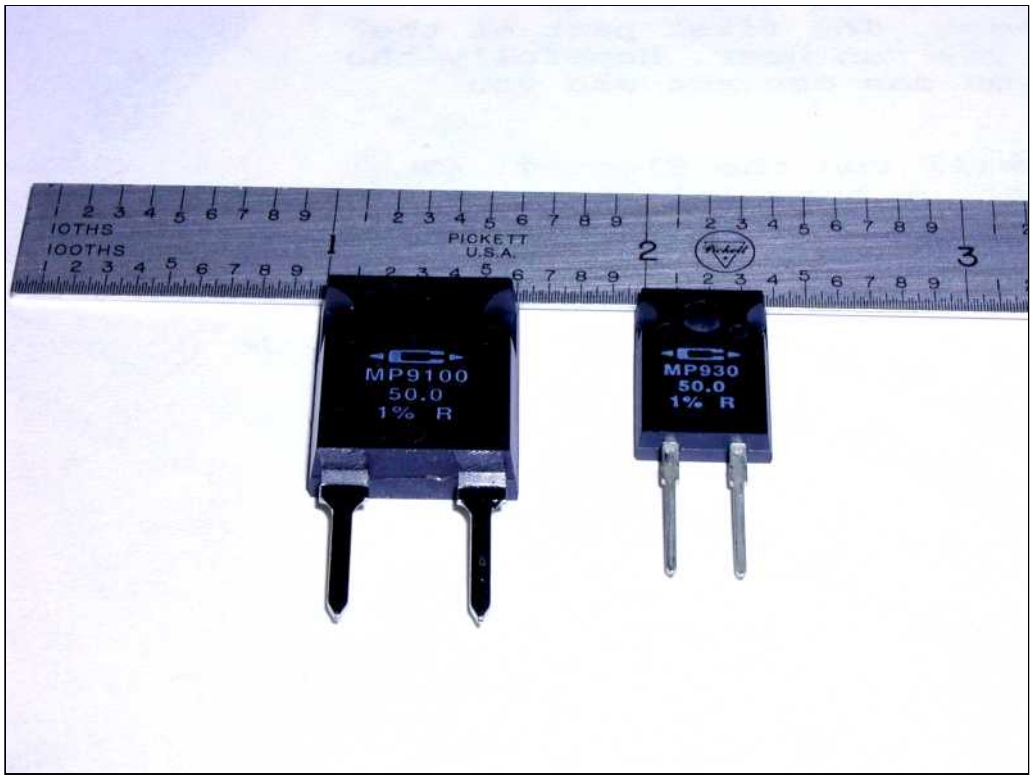


Figure 4

Figure 4 illustrates the relative physical size of both the 100W (left) and the 30W (right) Caddock thick-film resistors. They are quite small and without adequate heatsinking represent only a 3W and a 2W resistor. Ample heatsinking with thermal compound is imperative if you plan to obtain the best performance from your dummy load.

Pricing of the Caddock 50-Ohm 1% thick-film resistors is shown below. Prices are taken directly from Mouser Electronics (www.mouser.com, or 1-800-346-6873) catalog #614.

Mouser #684-MP930-50	50 Ohm 1% 30W Caddock MP Pwr Film Resistor	$3.55 (US)
Mouser #684-MP9100-50	50 Ohm 1% 100W Caddock MP Pwr Film Resistor	$8.88 (US)

I measured the actual DC resistance of my 30W 50-Ohm 1% resistor. It checked at 50.34 Ohms. Putting the dummy load on my Bird 43 wattmeter with 50W elements for HF, VHF (2M), and UHF (at 448MHz), with 50W forward (35W UHF), and then switching to the reflected power setting, the needle came off the pin less than the width of the needle itself...!

I think I'm gonna like this dummy load. My next project will be a 100W load of the same general design (using the 100W film resistor), but with a larger heatsink.