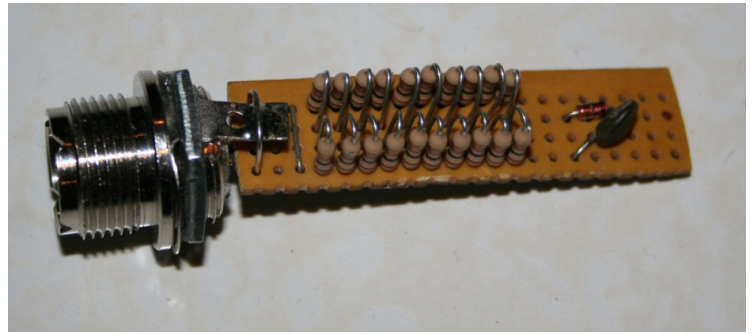


ZS6KMD QRP 5 / 10 W Dummy Load with Meter

By ZS6KMD

Description



Below is a simple QRP 5 or 10 Watt Dummy Load. The 1k Ohm resistors in parallel make up a 50 Ohm for 5 or 10 Watt load depending on if you use half or quarter Watt resistors. Do not use wire wound resistors only carbon or metal oxide. The 1N4148 diode and 0.01µF capacitor form the feed for a 100µA meter to read the RF power output. Using a known good meter it is possible to calibrate the meter face to accurately reflect the power output. The meter will read from less than 1W to about 10W, do not exceed 12W or the diode will be damaged. As an alternative a cheap DVM can be used and the table in figure 3 used to convert to Watts out. The equation for a silicon diode with a voltage drop of 0,6V is $P = [(V + 0.6 \times 0.707) \text{ squared}] / R$. My thanks go to Pierre ZS6BB for helping with the Formula and conversion table.

Construction

As can be seen by the image in Figure 1 and 2, construction starts with inserting all 20 X 1K Ohm resistors into the holes provided on the board. Solder joints should be checked for bad or dry joints. The 0.01 µF capacitor is inserted next and lastly the 1N4148 diode. Care should be taken with the orientation of the diode ensuring that the Anode and Cathode are correctly aligned. The DV meter connects to the two remaining holes adjacent to the capacitor and diode. The RF connector (BNC or SO239) can now be soldered on or even a short length of coax with a connector on. If using a 100µV meter, a suitable resistor will be required. On my unit I inserted a 3M Ohm variable resistor in series with the meter and calibrated the meter with that, after which I read the value of the variable resistor and replaced it with a single 1.3M Ohm ¼W resistor.

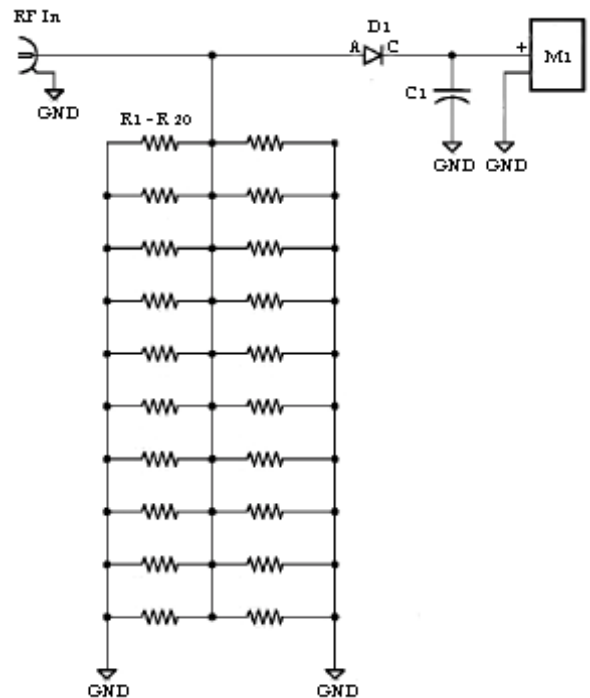
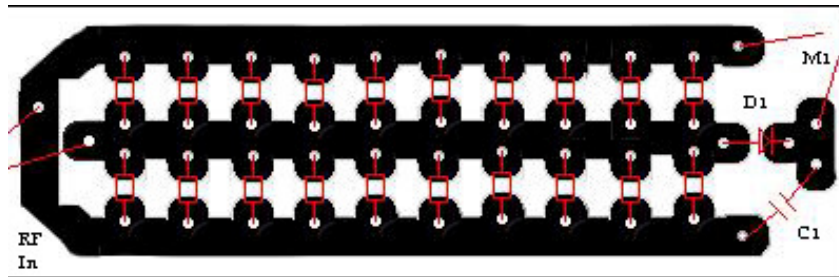


Figure 1.

Figure 2 shows the PCB layout for the dummy load, it is not critical to follow this layout, however the final load should equate to 50 Ohm ± 5%. I have used a short length of copper pipe with end caps to encase my dummy load and prevent RF radiation. The meter used is a mini meter from an FM radio providing battery state. The dial has been calibrated for 1-5Watt. The connector used is a BNC and connects either directly to the QRP Transceiver or via a short pig tail with BNC or PL258 plugs.

Figure 2. (Not to scale)



Parts List

R1 – R20 – 1K Ohm carbon resistors (half or quarter watt)

D1 – 1N4148 Silicon Diode

C1 – 0.01µF Ceramic capacitor (at least 60V)

PCB

M1 – 100 µA Meter

Metal enclosure

BNC or SO239 socket

Suitable resistor to calibrate meter

Figure 3.

Power vs Voltage table

$$P = [((V + 0.6) * 0.707)]^2 / 50$$

Milliwatt	Voltage
100	3.2
200	4.5
400	6.3
600	7.7
800	8.9
1,000	10.0
1,200	11.0
1,400	11.8
1,600	12.7
1,800	13.4
2,000	14.1
2,200	14.8
2,400	15.5
2,600	16.1
2,800	16.7
3,000	17.3
3,200	17.9
3,400	18.4
3,600	19.0
3,800	19.5
4,000	20.0
4,200	20.5
4,400	21.0
4,600	21.5
4,800	21.9
5,000	22.4

Milli watt	Voltage
5,200	22.8
5,400	23.2
5,600	23.7
5,800	24.1
6,000	24.5
6,200	24.9
6,400	25.3
6,600	25.7
6,800	26.1
7,000	26.5
7,200	26.8
7,400	27.2
7,600	27.6
7,800	27.9
8,000	28.3
8,200	28.6
8,400	29.0
8,600	29.3
8,800	29.7
9,000	30.0
9,200	30.3
9,400	30.7
9,600	31.0
9,800	31.3
10,000	31.6
10,200	31.9