Electro-Resales

50 Ω Dummy Load for Transmitter testing and experiments

Many thanks for purchasing this dummy load, it has been designed to provide constant 50 Ω impedance to a radio transmitter to allow off air tests and experiments.

Constructed of high quality PCB material and using 20 x 1KΩ 3 Watt Metal Film resistors a SWR of 1.1:1 is possible from 1MHz – 30 MHz, the SWR increases at 50 MHz & above

The dummy load is air cooled and capable of absorbing RF energy of 40-50 Watts continuously for 1 minute, and up to 100 Watts for a few seconds.

The dummy load also incorporates a measuring port consisting of a capacitor (650 V DC rating) and diode (BAV21) with output banana jacks on the PCB allowing the dummy load to be connected to a voltmeter, and with a simple calculation the output voltage can be converted to give RF output power.

Connection to the dummy load is via a high quality BNC jack mounted on the PCB.

The PCB measures (approx.) 2.5" x 3.75" – this size makes the load suitable for mounting in a quart paint can filled with non-toxic mineral oil or a wide mouth pint Mason jar similarly filled.

How to use your new Dummy Load

CAUTION:

The load components are exposed, touching them while in use can cause both heat and/or RF burns.

The dummy load is designed to provide a constant load to your radio transmitter, impedance matched to the transmitter output at 50Ω. Connection to the transmitter is via a 50Ω coax cable terminated in a BNC
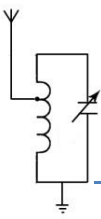
connector for the dummy load and a connector suitable for the antenna port on your radio.

The dummy load can also, like an antenna, be a used as the termination point for a power meter or SWR meter to provide a balanced load to the transmitter. The dummy load should always be the last part of the transmission line, just as the antenna would be.

As with all tests on air or off air with a load, always start by using low output levels of RF, after establishing that no issues exist, and then higher power levels can be used. We suggest using 10-25 Watts as a starting level.

Remember that the dummy load as supplied is a 'dry load', for use at power levels of more than 50 Watts for any duration the load should be converted to a 'wet load', by mounting it in an enclosure and using inert Mineral oil as the heat absorbent.

The dummy load also has a meter port located on the board, as shown in this photo, which can be used to measure RF output levels, by connecting a multimeter to these banana jacks, and with the multimeter set to DC Volts range, the voltage at various RF output levels can be measured.
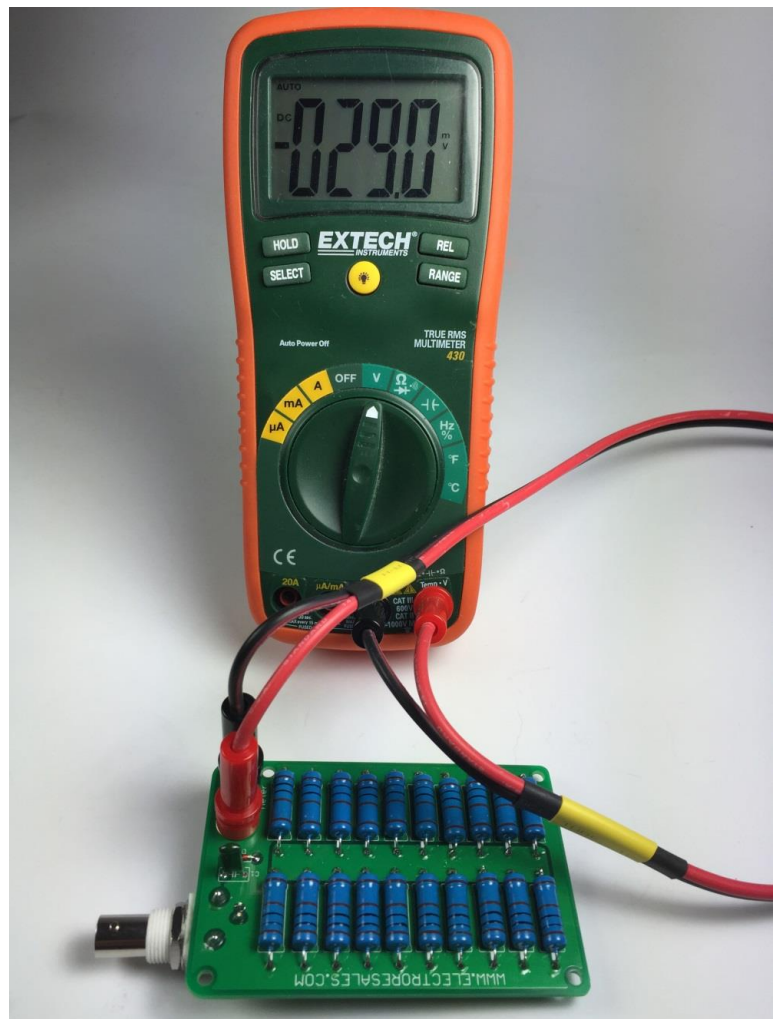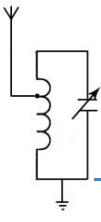
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The following example shows how to calculate RF energy from the measured voltage:
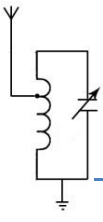
Example Calculation;

Measured voltage = 65 VDC, add 0.4 V for the diode = 65.4 VDC

Divide this result by 1.414 to obtain the RMS value = 65.4/1.414 = 46.25 VDC

Square this result and divide by 50 = 46.25 x 46.25/50 = 42.78

RF output is ~ 43 Watts

More examples of these calculations are shown below;

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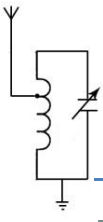

How to convert measured voltage to Power

Measured Voltage across dummy load = 26.01 V DC

Add 0.4 V for diode drop = 26.01 + 0.4 = 26.05 V DC

Divide by 1.414 (to get RMS) = 26.05/1.414 = 18.43

Square this result and divde by 50 = 18.43 x 18.43/50

= 339.4/50 = 6.78 Watts output power

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How to convert meaured Voltage to Power
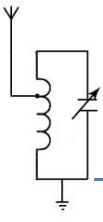
Measured voltage across dummy load = 68.8 V DC

Add 0.4 V DC for diode drop = 68.8 + 0.4 = 69.2 VDC

Divide by 1.414 (to get RMS) = 69.2/1.414 = 48.94

Square this result and divide by 50 = 48.94 x 48.94/50

= 2395/50 = 47.9 Watts output power

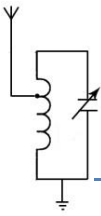# Electro-Resales

How to convert measured voltage to Power

Measured voltage across dummy load = 103.5 V DC

Add 0.4 for diode drop = 103.5 + 0.4 = 103.9 V DC

Divide by 1.414 (to get RMS) = 103.9/1.414 = 73.47

Square this result and divide by 50 = 73.47 x 73.47/50

= 5399/50 = 107.98 Watts output power

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The small Print

DISCLAIMER

Any person who constructs or works on electronic equipment may be exposed to hazards, including physical injury, the risk of electric shock or electrocution.. These hazards can result in health problems, injury, or death. Only qualified persons who understand and are willing to bear these risks themselves should attempt the construction of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

There is a risk of electric shock, electrocution, burns, or fires that is inherent in the construction and use of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

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