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Microwave SWR Meter

By Paul Marsh

"A simple but effective SWR meter for the low microwave bands."

After experimenting with the strip line based SWR meter, another solution needed to be tried in order to get the losses through the SWR bridge down to a resonable level.

After chatting with microwave aficionados Julian - G3YGF and Andy - G4JNT, this design was built. Basically it consists of 2 pieces of UT141 semi rigid coax. On both pieces of semi rigid coax, a slot of around 30mm in length is filed to expose the centre conductor. The slot width is about 2mm. The two slots, one on each coaxial cable are then put together, such that the transmission lines are parallel, and soldered along the full length on both sides. Make an effort to solder properly. The 30mm window in each piece of semi-rigid must be lined up so the coupling will be efficient.



This technique not only provides good coupling, but ensures that both transmission lines have a relatively constant 50 ohm impedance.

The main through RF line is terminated with good quality N type chassis sockets, whilst the coupling line has SMA plugs attached to it.

The coupling line is then terminated with 50 Ohm loads, made with two 100 ohm surface mounted resistors. These resistors are mounted on the back of an SMA socket (see circuit diagram below). The centre pin of the SMA socket also has a mixer diode from an old Marconi LNB connected to it. Ideally, a good quality microwave diode would be used instead of the mixer diode from the LNB. The other pins of the mixer are supported on 1n and 10K chip components, with the DC output being taken from the top of each 10K resistor.

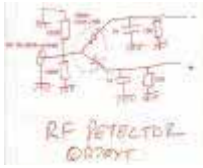
The picture below shows the SMA circuitry in a little more detail. In addition to the detector circuit, a simple op-amp voltage amplifier circuit is required as the output from the mixer-diode-detectors are small. A switch and pot are required to select forward or reverse voltage. Once the meter is calibrated using the pot for full scale reading on forward power, then reverse readings can be taken with relative ease.

Using this SWR meter for 2.4Ghz wireless lan antenna testing is simple, and providing UHF construction techniques are observed, this meter will perform very well.

I'd like to thank Julian - G3YGF and Andy - G4JNT for their invaluable help whenever a microwave type question needs answering.

Attachments

When viewed on the FRARS website, this article has the following attachments available for download:



[detector.JPG](#)

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