MFJ-66 Grid Dip Adapter

Solution

MFJ-66 Grid Dip Adapter

For MFJ Analyzers

The MFJ-66 adapter is used to measure a circuit inductively, which cannot be directly connected to. An assortment of sizes is included, for most useages. The different size coils have a fixed input voltage from the analyzer, and so have a different size magnetic field.

When the coil is held near a circuit, the magnetic field cuts across it. Depending on the device under test(DUT), the circuit will interfere with the field. At resonance, the circuit acts as a transformer, and becomes the secondary. The MFJ-66 becomes the primary, with power supplied by the analyzer. The *degree of coupling* between the primary and secondary will determine how much power is transferred across the two. Too much and you have overcoupling, and too little will have undercoupling. Each case will reduce the amount of power transferred across the juntion. For example, you want to measure a resonant circuit which is mounted to a pc board. In this case, the standard coils have a field which is much too large, and couples to other devices on the pc board surrounding the DUT. In this case, you may have to wind your own MFJ-66 type coil using something small like a pencil tip. The magnetic field becomes much smaller and couples to the DUT nicely. On the other extreme, you try to measure an amplifier tank circuit, with coils five or six inches in diameter. Now, in comparison, the standard MFJ-66 coils are much too small to couple properly. You would make a very large coil, maybe two or three inches in diameter, to couple properly.

The operation using the MFJ-66 is fairly straightforward once the degree of coupling is optimized. It is helpful to see the power drawn from the analyzer as if it were reflected power from an antenna. From the analyzer viewpoint, power is lost across the junction and not returned. When the secondary circuit frequency equals the analyzer frequency, resonance occurs and maximum current is drawn across the junction. The analyzer sees this and will give a dip in the swr meter reading. If a proper degree of coupling is in effect, an swr reading of 1:1 will be shown. This indicates that no return power is happening on the primary. As the frequency moves away from resonance, the return power will increase.

Sometimes a proper degree of coupling cannot be reached. This frequently happens when reading antenna traps. The primary may work best on the end, the side, or even inside the coil under test. Each type and size may be a challenge to couple. If even a minimum of coupling can happen, a small dip may show on the swr meter. This is also common on grid dip meters. You have to know the approximate frequency range to search.

Another type of coupler for antenna trap measurement is made from a short coax. One end plugs into the analyzer normally. The other end is left open, or you can construct a coax adapter to the coil. This method was found via the internet, to be passed on. To make the primary coil, take a piece of insulated wire and wind it two turns, about 4 inches in diameter. Connect this to the center conductor of the coax. The outer end is left open. Hold the trap inside this loop and look for a dip near the expected frequency. It gives a fairly nice dip.

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Article details

Article ID: 271
Company: MFJ
Date added: 2019-11-08 12:04:20
Views: 32

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