

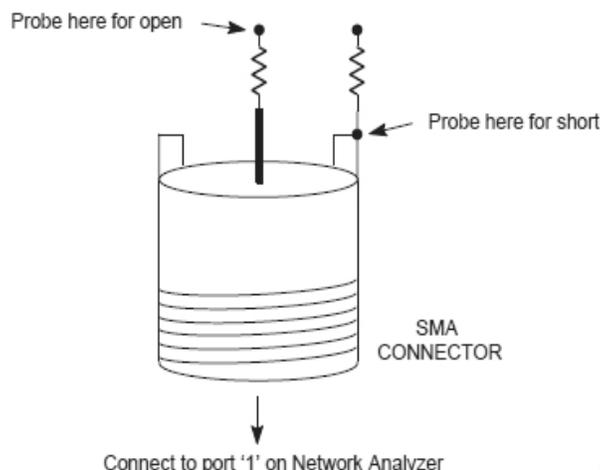
Method of Achieving High Impedance Matching with a Network Analyzer

<http://www.qsl.net/va3iul/>

The network analyzer lends itself very nicely to obtaining 50 ohms matches. However, for high impedance matches the Smith chart data will be far to the right of the chart and will be inaccurate, hard to read, and hard to interpret. If the network analyzer were normalized to the impedance value to which you want to match, the data would be in the center of the Smith chart and easy to interpret.

One method of doing this is to disconnect the 'A' port from an HP network analyzer and attach a high impedance probe to this port. Next take an SMA connector (or whatever connector type your analyzer uses) and solder two resistors each equal to the target impedance in the following manner:

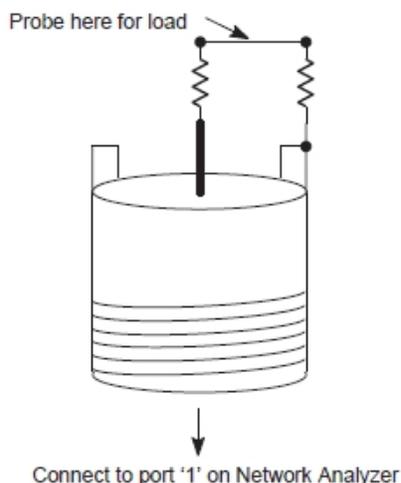
- Solder one end of one of the resistors to the center lead of the connector and leave the other end open. This resistor will define the normalization on the network analyzer during calibration.
- Next, solder one end of the other resistor to the ground of the connector and leave the other end open. This resistor will function as a dummy load during calibration.
- Connect this SMA connector to port '1' on the network analyzer.



You are now ready to calibrate.

Prior to initiating the open portion of the one-port calibration procedure, contact the open end of the resistor soldered to the center lead of the connector with the high impedance probe (see Figure above). After this has been completed, contact ground on the connector with the high impedance probe prior to initiating the short portion of the one-port calibration procedure (see Figure above).

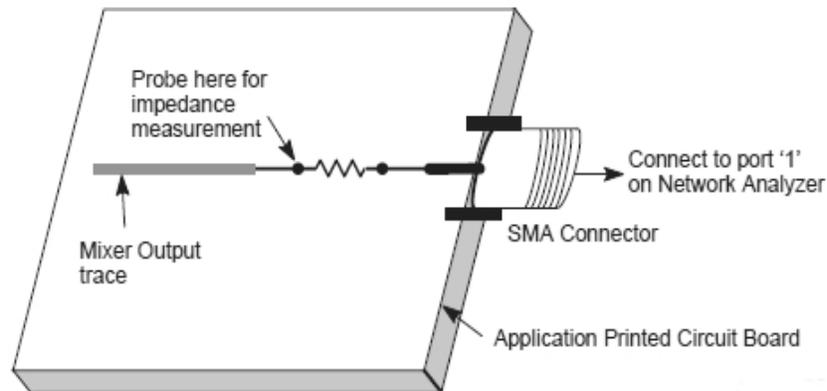
Then connect the two open ends of the resistors with solder.



Prior to initiating the load portion of the one port calibration procedure, contact the connection between the resistors with the high impedance probe (see Figure above).

The network analyzer should now be normalized to your target impedance.

Thus, the optimum match will once again be in the center of the chart.



When making connection to a circuit it is necessary to include a resistor of the same value used during the calibration between the center lead of the connector and its connection to the circuit.

Impedance measurements are taken by contacting the high impedance probe at the end of this resistor nearest the circuit (see Figure above).

Another tip concerning the calibration of the network analyzer should be mentioned.

- It is often useful to be able to look at a Smith chart over more than one frequency range.
- A wide frequency range is useful initially when your results are far off the target.
- Then the narrower range is useful for fine tuning your results.
- So, it is recommended that you calibrate in both frequency ranges and save the settings in the internal registers of the network analyzer if possible.

References:

Philips Application Note AN1777