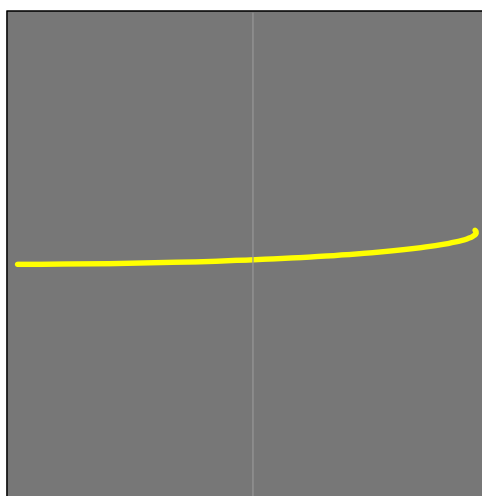


Let's Use ESR III. Tuning/ Matching Microwave Bridge

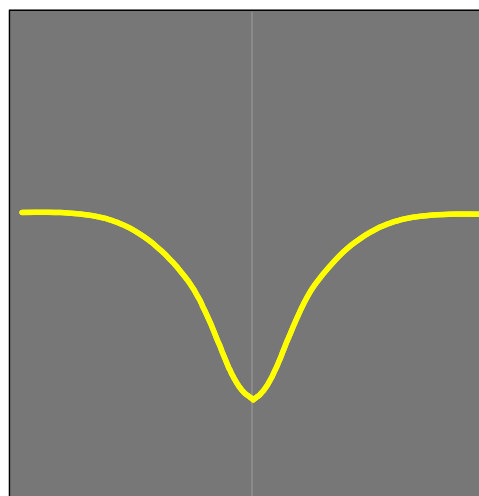
ESR may be used to measure a wide range of samples. However, it is necessary to determine the most appropriate conditions for each sample. Here we explain how to adjust the microwave-bridge.

Before placing the sample in the tube into cavity resonator, open Q-Dip window. Press the MOD button on the screen. Next, place the sample in the cavity. Be sure to set sample in this order.

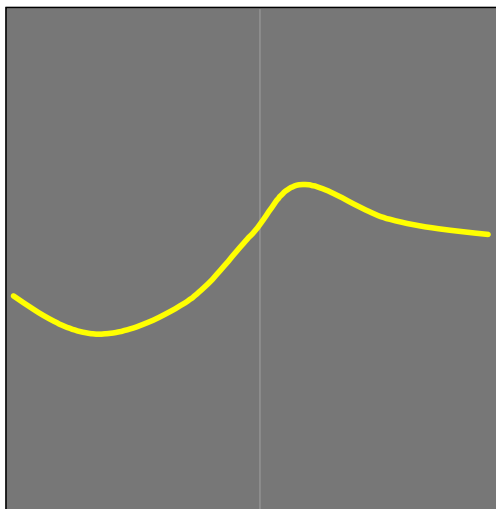
1. Apply about 1 mW microwave power. A curve as shown below is normally displayed on the screen.



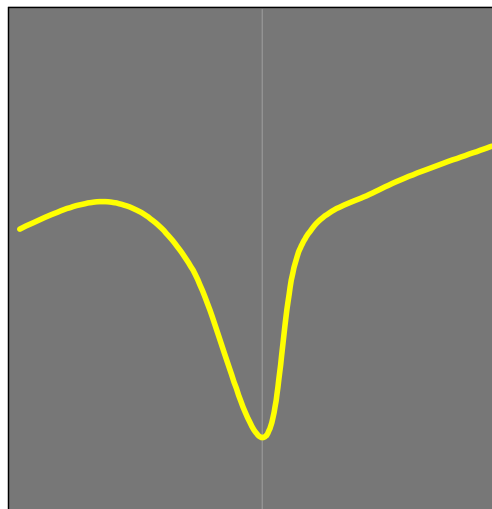
2. In the REF-OFF condition, change Frequency so that the Q-dip comes to center of the screen. Then, adjust Coupling so that bottom of the Q-dip becomes deeper.



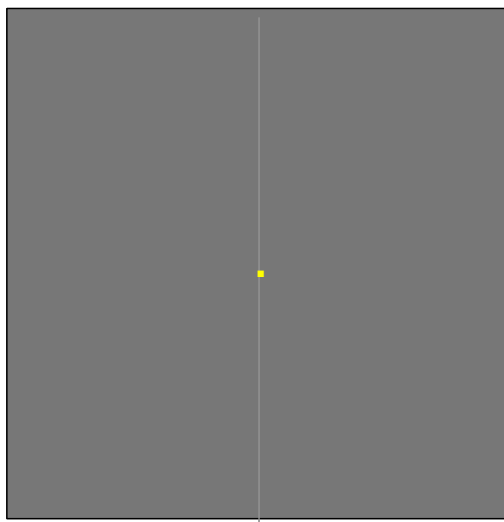
3. Turn REF-ON. The Q-dip is often distorted.



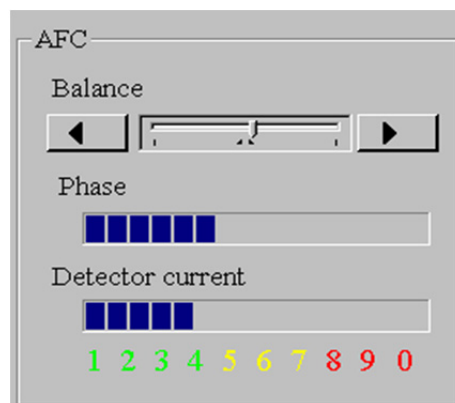
4. Adjust Phase so that Q-dip becomes symmetric and the bottom is at the center.



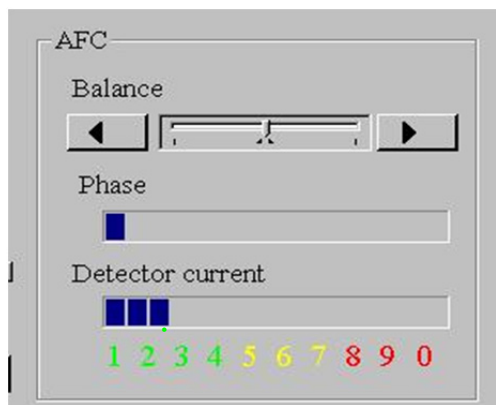
5. Turn AFC-ON. Q-dip disappears and a central spot or point appears, and the AFC meter becomes active.



6. Check the position of Detector Current at 0 mW microwave power.



7. Increase Power slowly. The Phase and Detector Current indicators gradually change. Slide Phase and Coupling to keep Phase indication at a minimum and to keep Detector Current indication the same as that indicated at 0 mW.



8. Gradually increase Power to 200 mW, keeping the Detector Current indication unchanged. This position is called “just-coupling”, where the highest sensitivity measurement may be expected.

In adjustment, pay attention so that meter does not reach the maximum.

After attaining “just-coupling”, be sure to reduce the Power to the appropriate level for the actual measurement.

When exchanging a sample, be sure to reduce the power to less than 1mW.

Depending on the sample, there may be cases when the Q-Dip is not obtainable at stage 2. Also, even if a Q-Dip is obtained, as the microwave power is increased, DET CURRENT moves a lot, so it is unstable even at only a few mW. In such a case, it is possible that the sample has a large microwave loss. So, please consider the sample tube and the volume of sample again by referring to Application Note ER-060004.