Sample results for FSK project detectors

In order to help you decide if your design is meeting the requirements and whether they can be attained, below are a few examples of simulated and measured results for FSK detectors operating at 2.4 and 2.6 GHz.
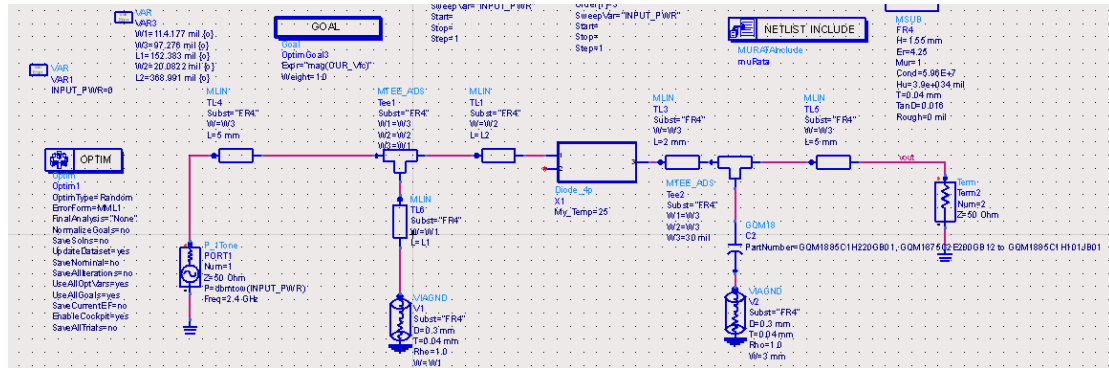

Figure 1. First detector design at 2.4 GHz using zero-bias diode. Note the optimization used. Substrate is FR4. This design uses an extra "load" resistor in parallel with output capacitor. Strictly speaking, it is not necessary but you may want to investigate if it helps your design in some fashion. Note that it should be fairly large resistor (at a minimum tens of kOhms but hundreds of kOhms are better; read app note on D2L about this.) I believe that the final design did not have any resistor soldered.
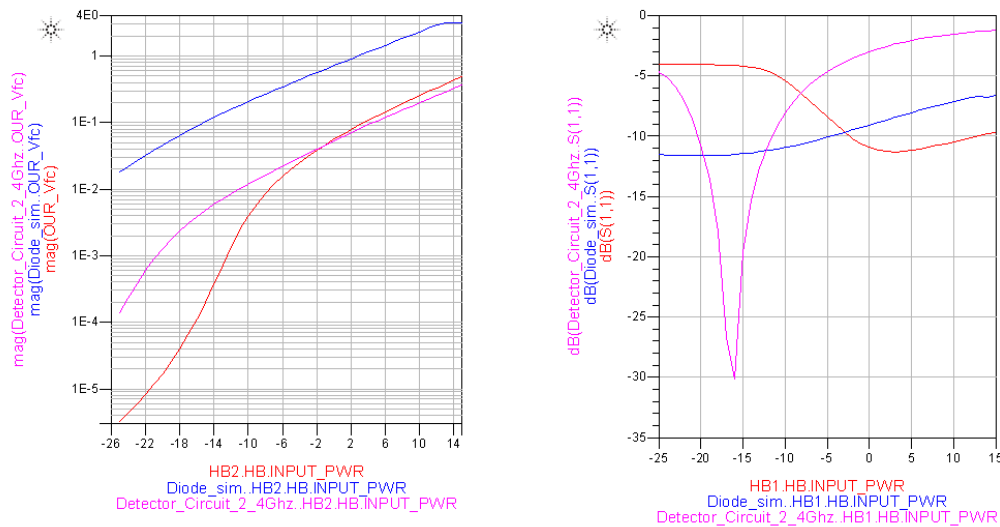

Figure 2. Simulation results for diode detectors for different types of simulations and outputs. This is just an example - you should not use it as some standard to be matched by your results.
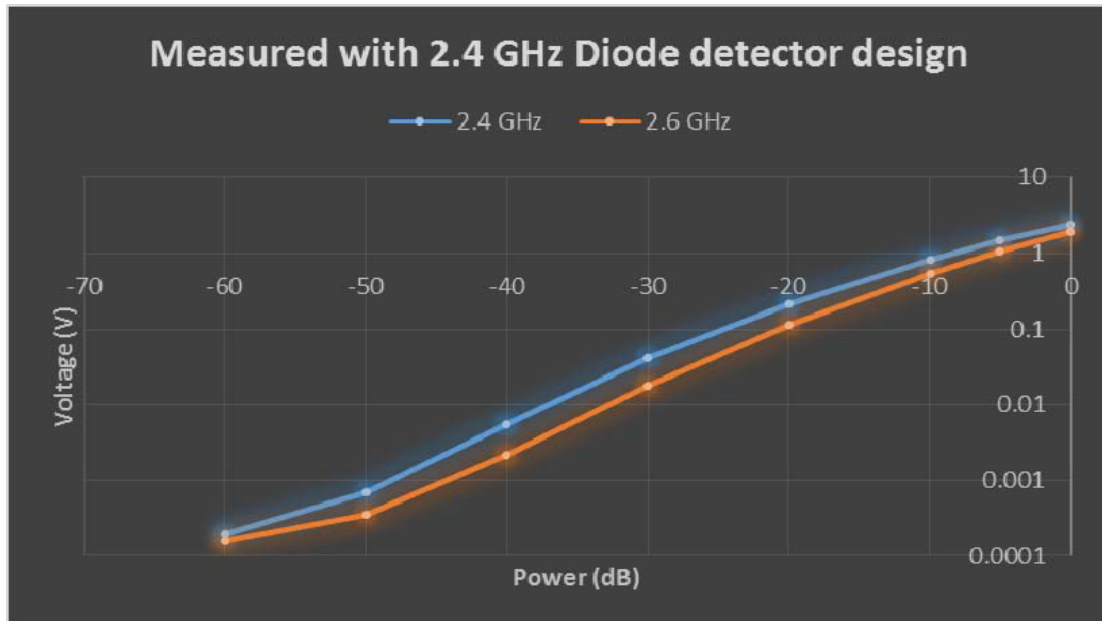
Figure 3. Measured detector results for 2.4 GHz detector design. Note that mV levels or even 0.1 mV level should be detectable with some of our DMMs.
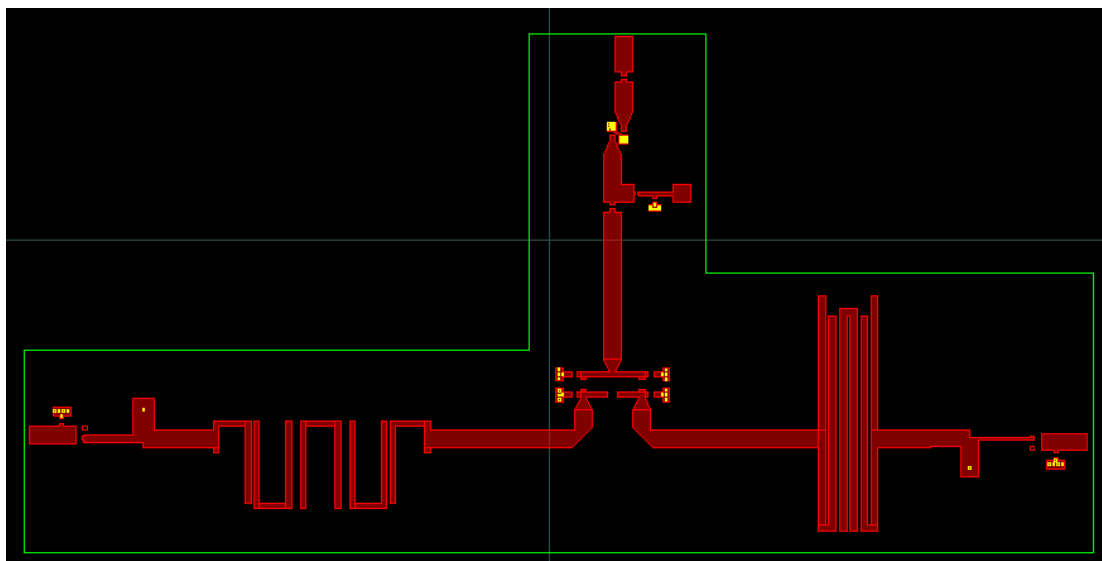

Figure 4. Final layout for the design given above.

Below are some results from a very different design approach and are only meant to illustrate what can be accomplished.
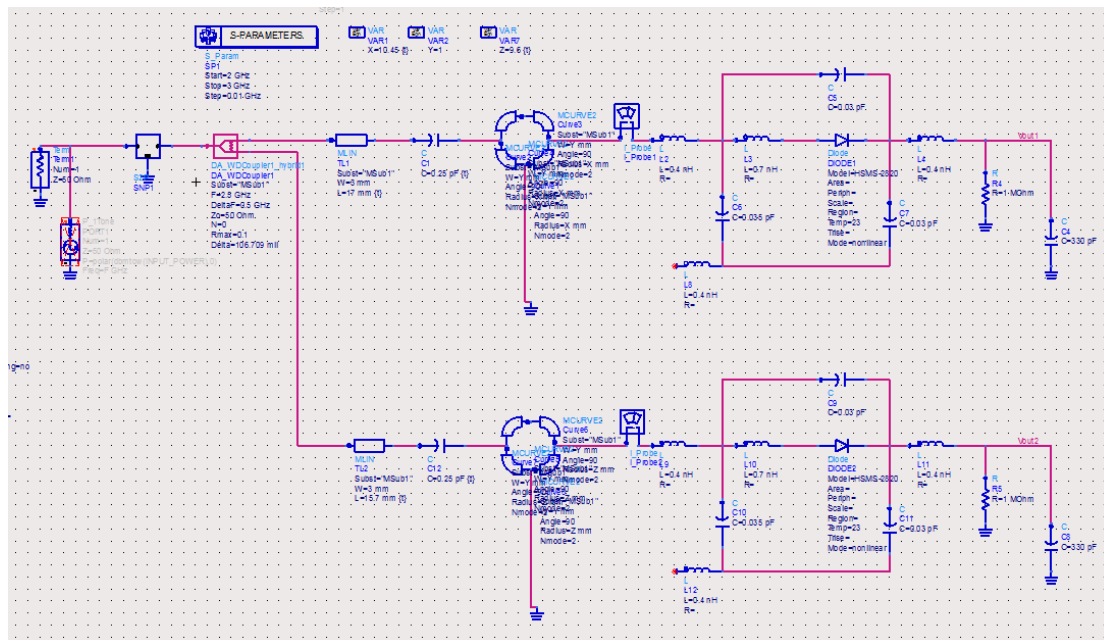
Figure 5. This design used ring resonators to accomplish filtering function and detector diode was used as coupling element between the resonator and the detector itself. Note that the output has 1 MOhm resistor and 330 pF capacitor.
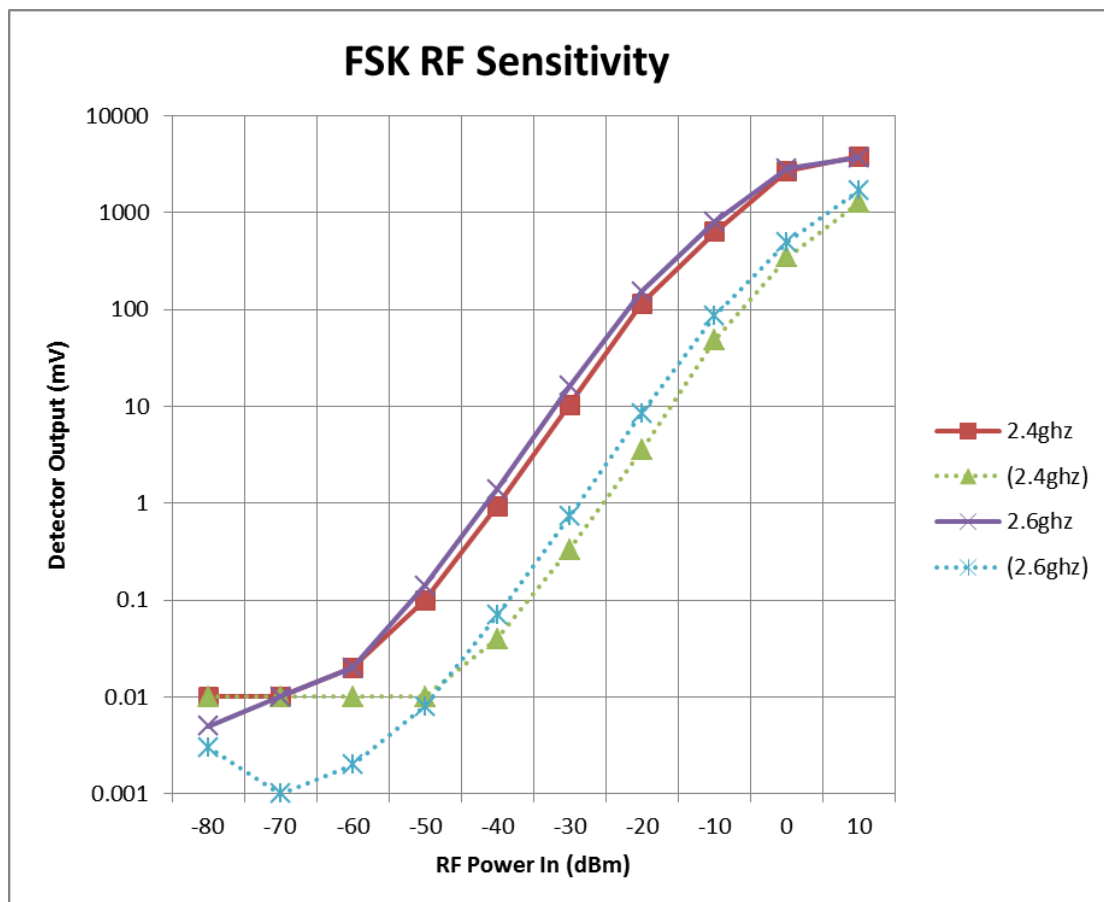

Figure 6. Final results for the ring-resonator based design. Very low signal levels were detectable.