Project B

Project B is for you to learn how to design a microstrip patch antenna using different feeding mechanisms. You can also compare the bandwidth performance using different feeds.

Specifications:

Design a microstrip patch antenna with a center frequency of 5 GHz on an RO4003 Substrate (31 mil thick, ½ oz copper (17 µm)). You can find the dielectric constant and loss tangent of RO4003 in its datasheet. Use:

1. Microstrip line inset feeding
2. Coaxial probe feeding (SMA connector dimensions can be found in <https://www.amphenolrf.com/connectors/sma-connectors.html>. The dielectric constant of Teflon in the SMA connector is ~2.1.

Submit a report which contains:

1. The drawing of the entire antenna structure with the air box shown. (40 pts)
2. Convergence Tab (10 pts)
3. S11 versus frequency (10 pts)
4. Compare the bandwidth of the two designs in the same graph and comment (10 pts)
5. E Plane radiation pattern and H plane radiation pattern (10 pts)
6. 3-D radiation pattern (10 points)
7. Gain (5 pts) and efficiency (5 pts) from the simulations