Homework #11 EMI & Shielding

1. What is the skin depth in aluminum at **1Mhz** and **1Ghz**?

2. What is the impedance at **1Ghz** of a one inch long copper PC board trace with the following dimensions (use the Rac equation in the following link)?
http://www.ti.com/lit/wp/snaa113/snaa113.pdf

a. 10 mils wide and 1 mil thick

b. 10 mils wide and 2 mils thick

c. 20 mils wide and 1 mil thick

3. You need to shield a sensitive circuit from a nearby radio station. The radio station broadcasts at **100Mhz** and the signal strength at your location is **100mV/m**. You need to reduce the strength down to **1mV/m** inside your enclosure (i.e. inside the shield).

a. How much attenuation do you need (give your answer in db)?

b. How thick should an aluminum enclosure be to guarantee the needed attenuation at **100Mhz**?

c. You need to have a hole in the enclosure for some power and I/O lines. What is the largest dimension the hole can have and still guarantee the needed attenuation at **100Mhz**? Use Eq.6 on page 10 in the following link: http://www.analog.com/media/en/training-seminars/tutorials/MT-095.pdf