

Homework 7

ECE 4370

Problem 1:

Assuming an ideal field distribution with uniform phase from the TE_{10} mode of a rectangular waveguide has been propagated to the aperture of a horn antenna with width A and height B , calculate the directivity pattern and ideal peak gain (assuming 100% radiation efficiency) in terms of A , B , and λ . (10 points)

Problem 2:

You must design a 4 GHz horn antenna with maximum peak gain, fed by a standard rectangular waveguide ($a = 2b = \lambda/2$). The maximum length of the flared horn antenna, R_p , must not exceed 50 cm. Provide an engineering diagram, fully dimensioned, for your company's metal shop to produce. (10 points)