

ECE 204
Spring 2001
Prof. J. E. Ayers

Homework Assignment 1
Due: Wednesday, January 31, 2001

Reading: Boylestad and Nashelsky: Ch. 1 and Ch. 2

1. Calculate the resistance of a pure silicon sample, 4 cm long, and with a cross sectional area of 1 cm x 1 cm, at room temperature. Repeat for a sample of pure copper with the same dimensions.
2. Calculate the resistance of a copper wire, 1 mm in diameter and 2 km in length.
3. Calculate the intrinsic (not including the series resistance) dynamic resistance of a silicon diode operating at 1 mA. Repeat for the case of 20 mA.
4. Obtain the data sheet for a Panasonic MAZ3100 zener diode and attach it. What is the tolerance on V_Z (in percent)? What is the maximum operating temperature? What is the maximum DC current?
5. Using the sources of information at your disposal, determine the band gap and at least one device application for the semiconductor GaN.