INTRODUCTION

The "Boltzmann constant", commonly referred to as, *k*, is a critical constant in the study of semi-conductors and solid-state physics. It is a constant of proportionality that relates particle energy per unit temperature. The Boltzmann constant is an adaptation of the ideal gas constant, *R*, when precise numbers of particles are being measured instead of units of moles. Max Planck introduced the constant while working on the law of black body radiation.

A PN-junction is a semiconductor made up of n-type and p-type doped material that displays a unique relationship between voltage applied across the material and current. This relationship is what makes the PN-junction useful as a diode. By establishing the minimum current through a reverse-biased diode (I_0) and measuring voltage and current across a forward-biased diode, we will be able to calculate a value for Boltzmann's constant.

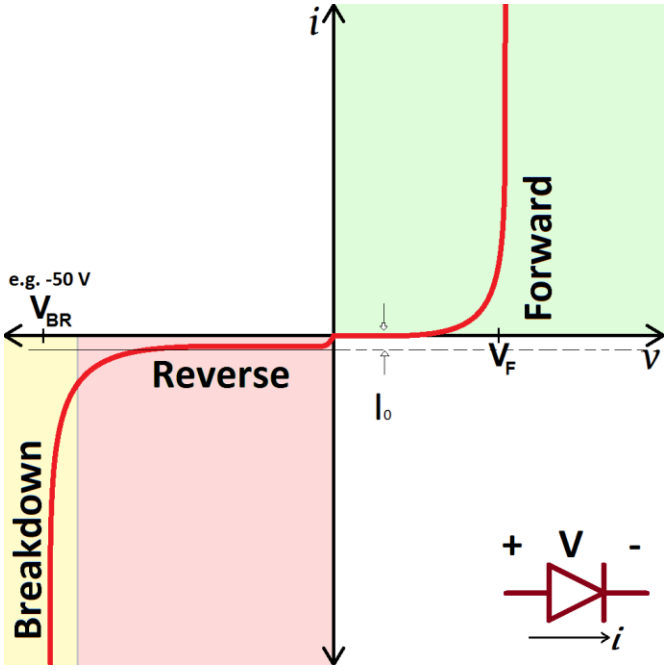

FIGURE 1: Current vs Voltage for common diode

We have reviewed this document and fully support its Content
– Greg W-Aric M -Jeremy W- frank z