

1 Purpose:

This experiment's purpose is to introduce the pn Junction diode. We will observe the voltage-current relationship of the pn Junction and how temperature effects that relationship.

2 Experimental Procedures:

2.1 Task 1:

2.1.1 Analysis:

Task 1 required us to design the circuit below and observe the current and voltage characteristics of the silicon diode 1N916. We changed the values for the resistor between $1\text{M}\Omega$, $100\text{k}\Omega$, $10\text{k}\Omega$ and $1\text{k}\Omega$ and varied the voltage between 1.5, 2.3V, 3.6V and 6V.

2.1.2 Data and Calculation:

	V_S	V_D	I_D
$1\text{M}\Omega$	1.5 V	0.287 V	$1.25\ \mu\text{A}$
	2.3 V	0.313 V	$2.08\ \mu\text{A}$
	3.4 V	0.337 V	$3.32\ \mu\text{A}$
	6.0 V	0.366 V	$5.83\ \mu\text{A}$
$100\text{k}\Omega$	1.5 V	0.405 V	$11.8\ \mu\text{A}$
	2.3 V	0.430 V	$19.4\ \mu\text{A}$
	3.4 V	0.455 V	$32.5\ \mu\text{A}$
	6.0 V	0.497 V	$57.5\ \mu\text{A}$
$10\text{k}\Omega$	1.5 V	0.525 V	$99.0\ \mu\text{A}$
	2.3 V	0.554 V	$164\ \mu\text{A}$
	3.4 V	0.571 V	$285\ \mu\text{A}$
	6.0 V	0.605 V	$0.552\ \text{mA}$
$1\text{k}\Omega$	1.5 V	0.631 V	$0.856\ \text{mA}$
	2.3 V	0.664 V	$1.59\ \text{mA}$
	3.4 V	0.685 V	$2.76\ \text{mA}$
	6.0 V	0.717 V	$4.95\ \text{mA}$

Silicon Diode - 1N916

2.1.3 Results:

We notice that the Voltage Current relation for the pn Junction under forward bias resembles an exponential function.

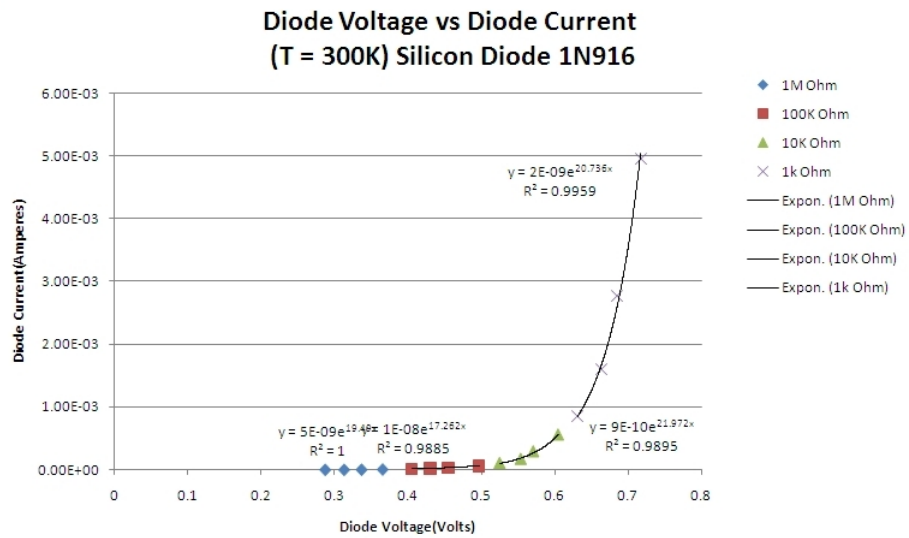


Figure 1: Diode Voltage vs Diode Current - Silicon Diode 1N916

2.2 Task 2:

2.2.1 Analysis:

Task 2 had us perform the same procedures done in task 1 except we replaced the silicon diode 1N916 with the Germanium diode 1N34. We measured the reverse saturation current as well.