**ECEN 452: Ultra High Frequency Techniques**

**Lab 3: TRL DEMO LINE**

**Measurement Values at 3GHz:**

S21 magnitude= -0.029361164dB

S21 phase= -40.838772

Line-Thru==m

1. **Attenuation Constant**

Is given by => = -**4.598dB/m**

1. **Effective Dielectric Constant:**

Is given by (1)

Hence, finding first using equation

From Observations, -40.838772=-0.71277rad and l= m

=>

Now using equation (1), we get

=>

1. **Propagation velocity of medium**

Is given by  **=>**

1. **Frequency Range for TRL kit**

Is calculated using formula

For 20degrees => f1= = **1.4699GHz**

For 160degrees => f1= = **17.759GHz**