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**Lab 3: TRL Calibration**

**Dimensions**

Thru = 22mm

Reflect = 11mm

Line = 28.44 m

Line-Thru = 6.44mm

Width = 3.07mm (for all lines)

Substrate thickness = 62mil

**Assignment**

1. Valid frequency range for the TRL kit:

This uses the answers found in #2. It is necessary to the frequencies to be between 20° and 160°.

***f*20° = 1.469 GHz**

***f*160° = 11.760 GHz**

1. Effective dielectric constant:

The additional length of the Line at 3GHz created a phase shift of -40.84°. This can be utilized to find εr:

Convert to radians and set equal to .

1. Propagation velocity of the medium:

This uses the answers from #2 to solve for velocity.

***v* = 1.704 \* 108 m/s**

1. Attenuation coefficient in Np/m:

The log magnitude at 3GHz is -0.029361164dB and this is used along with the additional length of the Line to calculate the attenuation coefficient.

Convert to Np/m