### Characteristic Impedance

$$Z_0 = \frac{138}{\sqrt{e}} \log_{10} \frac{D}{d} \quad \text{...ohms}$$

### Phase

$$\phi = \frac{30.5 \times F \times L \text{ (inches)}}{Vp} \qquad \triangle\phi = \frac{PPM \times 30.5 \times F \times L \text{ (inches)}}{Vp \times 10^6}$$

### Capacitance

$$C = \frac{7.38\ e}{\log_{10} \frac{D}{d}} \quad \text{...pF/ft} \qquad C = \frac{24.2\ e}{\log_{10} \frac{D}{d}} \quad \text{...pF/m}$$

### Delay

$$T = 1.016 \sqrt{e} \quad \text{...ns/ft} \qquad T = 3.33 \sqrt{e} \quad \text{...ns/m}$$

$$L = \frac{0.984T}{\sqrt{e}} \quad \text{...ft} \qquad L = \frac{0.300\ T}{\sqrt{e}} \quad \text{...m}$$

### Velocity of Propagation

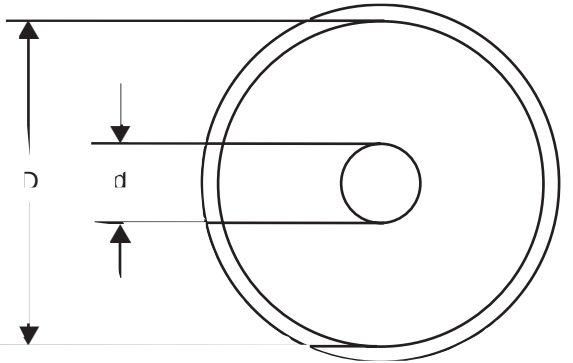
$$Vp = \frac{1}{\sqrt{e}} \times 100 \quad \text{...\% of Free-Space Velocity}$$

### Cutoff Frequency

$$F_{CO} = \frac{7.5}{\sqrt{e}\,(D + d)} \quad \text{...GHz}$$

### Attenuation (Theoretical) at 20° C

$$\alpha = \frac{0.434}{Z_0} \sqrt{F}\left(\frac{\sqrt{R_1}}{d} + \frac{\sqrt{R_2}}{D}\right) + 2.78\ F \sqrt{e}\ P_f \quad \text{...dB/100 ft}$$




Symbols

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|---|---|
| e | Relative Dielectric Constant |
| $Z_0$ | Characteristic Impedance |
| D | Dielectric Diameter (inches) |
| d | Center Conductor Diameter (inches) |
| T | Time in Nanoseconds |
| L | Length |
| Vp | Velocity of Propagation |
| $F_{CO}$ | Cutoff Frequency |
| $\alpha$ | Attenuation |
| $R_1$ | Ratio of Center Cond. Conductivity to Copper |
| $R_2$ | Ratio of Outer Cond. Conductivity to Copper |
| $P_f$ | Dielectric Power Factor |
| F | Frequency in GHz |