

TABLE 11.1 Distributed Line Parameters at High Frequencies*

Parameters	Coaxial Line	Two-Wire Line	Planar Line
R (Ω/m)	$\frac{1}{2\pi\delta\sigma_c} \left[\frac{1}{a} + \frac{1}{b} \right]$ ($\delta \ll a, c - b$)	$\frac{1}{\pi a \delta \sigma_c}$ ($\delta \ll a$)	$\frac{2}{w \delta \sigma_c}$ ($\delta \ll t$)
L (H/m)	$\frac{\mu}{2\pi} \ln \frac{b}{a}$	$\frac{\mu}{\pi} \cosh^{-1} \frac{d}{2a}$	$\frac{\mu d}{w}$
G (S/m)	$\frac{2\pi\sigma}{\ln \frac{b}{a}}$	$\frac{\pi\sigma}{\cosh^{-1} \frac{d}{2a}}$	$\frac{\sigma w}{d}$
C (F/m)	$\frac{2\pi\epsilon}{\ln \frac{b}{a}}$	$\frac{\pi\epsilon}{\cosh^{-1} \frac{d}{2a}}$	$\frac{\epsilon w}{d}$ ($w \gg d$)

* $\delta = \frac{1}{\sqrt{\pi f \mu_c \sigma_c}}$ = skin depth of the conductor; $\cosh^{-1} \frac{d}{2a} \approx \ln \frac{d}{a}$ if $\left[\frac{d}{2a} \right]^2 \gg 1$.

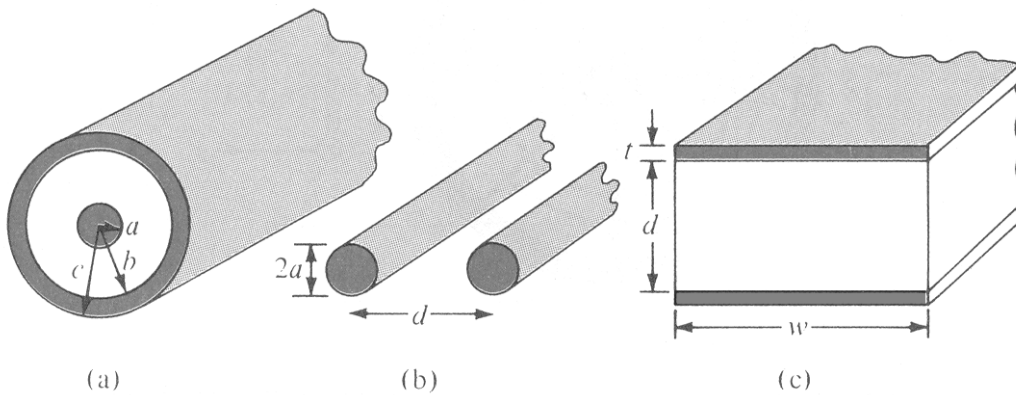


Figure 11.2 Common transmission lines: (a) coaxial line, (b) two-wire line, (c) planar line.