A typical Wilkinson power divider is made of quarter-wave transformers:

- The quarter-wave transmission lines have characteristic impedance $Z=\sqrt{2}Z0 \approx 70.7\ \Omega$ Z
- Resistor value: R=2Z0

The transmission line length is a quarter wavelength ($\lambda/4$) at the center frequency.

The wavelength in a substrate is given by:

$$\lambda_g = \frac{\lambda_0}{\sqrt{\varepsilon_{eff}}}$$

where: $\lambda_0 = \frac{c}{f_0}$

c is the wavelength in free space. ($c=3\times10^8$ m/s).

ε_{eff} is the effective dielectric constant of the substrate, which can be approximated by

$$\varepsilon_{eff} = \frac{\varepsilon_R + 1}{2} + \frac{\varepsilon_R - 1}{2}\left(1 + 12\left(\frac{H}{W}\right)\right)^{-0.5}$$

h is the substrate thickness and W is the width of the transmission line.

The physical length (L) of the transmission line is: L= $\lambda/4$