

7.10 Design a Wilkinson power divider with a power division ratio of $P_3/P_2 = 1/3$ and a source impedance of 50Ω .

- Also, draw labeled sketch of design.

Per text (p. 332), $K^2 = P_3/P_2 = 1/3$.

Using (7.37a), $Z_{03} = Z_0 \sqrt{\frac{1+K^2}{K^3}} = 50 \sqrt{\frac{1+1/3}{(1/\sqrt{3})^3}}$
 $Z_{03} = 131.6074 \Omega$

Using (7.37b), $Z_{02} = K^2 Z_{03} = 1/3 (131.6)$
 $Z_{02} = 43.8691 \Omega$

Per (7.37c), $R = Z_0 (K + 1/K) = 50 (\frac{1}{\sqrt{3}} + \sqrt{3})$
 $R = 115.4701 \Omega$

Port 2 output impedance $R_2 = Z_0 K = \frac{50}{\sqrt{3}} = 28.8675 \Omega$

Port 3 output impedance $R_3 = \frac{Z_0}{K} = 50\sqrt{3} = 86.6025 \Omega$

