

## CAD Laboratory

### Task 3: Power Divider

Design and build a 2:1:1 power divider (e.g., Wilkinson type, one input and three outputs with 50%, 25% and 25% power ratio) in microstrip technology for a frequency range centered around 4 GHz. The following specifications are to be obeyed:

Operating frequency range:	3 GHz – 5 GHz
Output isolation:	> 20 dB
Input and output matching:	> 20 dB
Amplitude mismatch:	< 0.5 dB

The circuit will be fabricated on a Rogers RO3010 substrate and mounted into an aluminum enclosure (without lid) with the dimensions 1" × 1" or 1" × 2". Use the following data for the substrate material during the design process:

Dielectric	$h = 0.635 \text{ mm (25 mil)} \pm 1 \text{ mil}$ $\epsilon_r = 11.2 \pm 0.30$ $\tan \delta = 0.0022$
Metalization	Copper $d_{\text{Cu}} = 17.5 \text{ }\mu\text{m}$ $\kappa_{\text{Cu}} = 5.8 \cdot 10^7 \text{ S/m}$

#### Literature:

- [1] R. E. Collin: Foundations for Microwave Engineering, 2nd ed. John Wiley & Sons, 2001.
- [2] G. L. Matthaei, L. Young, and E. M. Jones: Microwave Filters, Impedance-Matching Networks, and Coupling Structures, 2nd ed. Artech House, 1980.
- [3] D. M. Pozar: Microwave Engineering, 4th ed. John Wiley & Sons, 2012.
- [4] T. H. Lee: Planar Microwave Engineering – A Practical Guide to Theory, Measurement and Circuits, 1st ed. Cambridge University Press, 2004.