

ECEN 452 Lab 8 – Hybrid Coupler/Rat Race Coupler

Apply the report template to discuss the design, results, and sources of error for the Hybrid Coupler and the Rat Race Coupler simulations. In the results/discussion section, include the following plots:

Hybrid Coupler:

Measured and Simulated S11, S21, S31, S41 (dB) – Identify which traces show port matching, power splitting, and Isolation. Comment on the differences between simulated and measured results.

Measured and Simulated S21-S31 phase difference – This plot is already created in the HFSS file. To create the plot for the measured data, subtract the S31 phase data from the S21 phase data.

Rat Race Coupler:

Measured and Simulated S11, S21, S31, S41 (dB) – Identify which traces show port matching, power splitting, and Isolation. Comment on the differences between simulated and measured results.

Questions to consider for the report:

What modifications did you have to make to the T-line widths/lengths to improve your simulated results?

For what applications would each coupler be useful?

Why did we put matched loads on the ports while measuring the S-parameters?