S7.1. A 2 W power source is connected to the input of a directional coupler with C = 10 dB, D = 30 dB, and an insertion loss of 1 dB. Find the output powers (in dBm) at the through, coupled, and isolated ports. Assume all ports to be matched.

S7.2. A 5 W power source is connected to the input of a directional coupler with C = 5 dB, I = 25 dB, and an insertion loss of 2 dB.

(a) Find the output powers (in dBm) at the through, coupled, and isolated ports. Assume all ports to be matched.

(b) Find the directivity, D, in dB.

S7.3. Design a single-section microstrip coupled-line coupler with a coupling of 12 dB and a system impedance of 50 Ω. If the coupler is to be made in microstrip with ϵ_r = 10 and d (substrate thickness) = 1.8 mm, use Figure 7.30 on page 350 of your text to find the necessary width of the lines and separation between the lines.

S7.4. Design a single-section microstrip coupled-line coupler with a coupling of 8 dB and a system impedance of 50 Ω. If the coupler is to be made in microstrip with ϵ_r = 10 and d (substrate thickness) = 1.5 mm, use Figure 7.30 on page 350 of your text to find the necessary width of the lines and separation between the lines.