

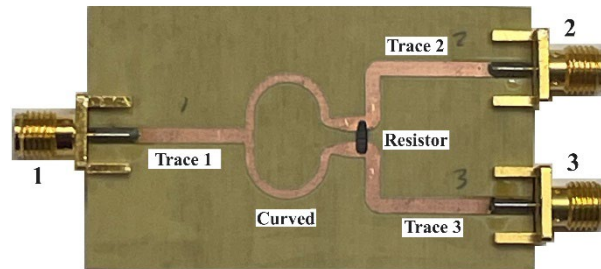
EE 481/581 Microwave Engineering (Fall 2025)

Laboratory 6 Multiport Device Analysis- Part 1: CSI SDSM&T Report

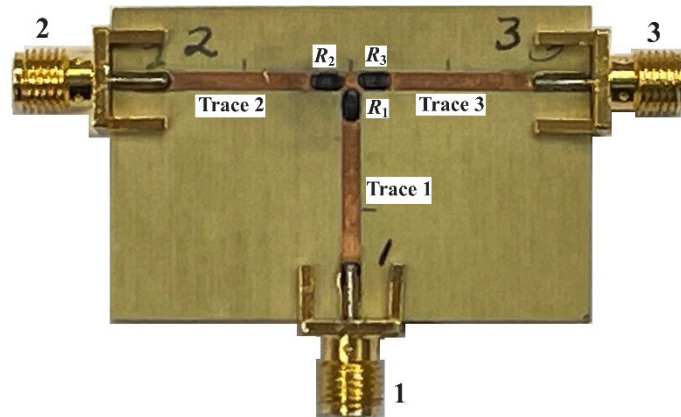
Investigators _____

Supported by the work in your logbook, complete this initial report on your findings. Your supervisor will expect results to be backed up by calculations, measurements, references, etcetera in the logbook.

Device 1



- 1) Device is a _____.
- 2) The characteristic impedances of the ports (labeled 1, 2 & 3 on picture above) are:
 $Z_1 = \underline{\hspace{2cm}}, \quad Z_2 = \underline{\hspace{2cm}}, \quad \& \quad Z_3 = \underline{\hspace{2cm}}.$
- 3) The Rogers Corporation RO4003C laminate thickness is $d = \underline{\hspace{2cm}}.$
- 4) On the picture above, what are the width W_x , length L_x , and characteristic impedances $Z_{0,x}$ of:
 Trace 1: $W_1 = \underline{\hspace{2cm}}, \quad L_1 = \underline{\hspace{2cm}}, \quad \& \quad Z_{0,1} = \underline{\hspace{2cm}}.$
 Trace 2: $W_2 = \underline{\hspace{2cm}}, \quad L_2 = \underline{\hspace{2cm}}, \quad \& \quad Z_{0,2} = \underline{\hspace{2cm}}.$
 Trace 3: $W_3 = \underline{\hspace{2cm}}, \quad L_3 = \underline{\hspace{2cm}}, \quad \& \quad Z_{0,3} = \underline{\hspace{2cm}}.$
 Curved: $W_c = \underline{\hspace{2cm}}, \quad L_c = \underline{\hspace{2cm}}$ per side, $\& \quad Z_{0,c} = \underline{\hspace{2cm}}.$
- 5) Based on the device type and prior information, the suspected resistor value $R = \underline{\hspace{2cm}}.$
- 6) Expected center frequency f_c , low frequency f_{low} , and high frequency f_{high} of:
 $f_c = \underline{\hspace{2cm}}, \quad f_{\text{low}} = \underline{\hspace{2cm}}, \quad \text{and} \quad f_{\text{high}} = \underline{\hspace{2cm}}$ (enter **n/a** if not applicable)
- 7) Predicted $[S]$ -matrix at f_c or a representative frequency: $[S] =$
- 8) Is the device lossless? Yes / No (circle)
- 9) Suggested test plan to confirm theories-

Device 2

- 1) Device is a _____.
- 2) The characteristic impedances of the ports (labeled 1, 2 & 3 on picture above) are:
 $Z_1 = \underline{\hspace{2cm}}$, $Z_2 = \underline{\hspace{2cm}}$, & $Z_3 = \underline{\hspace{2cm}}$.
- 3) The Rogers Corporation RO4003C laminate thickness is $d = \underline{\hspace{2cm}}$.
- 4) On the picture above, what are the width W_x , length L_x , and characteristic impedances $Z_{0,x}$ of:
 Trace 1: $W_1 = \underline{\hspace{2cm}}$, $L_1 = \underline{\hspace{2cm}}$, & $Z_{0,1} = \underline{\hspace{2cm}}$.
 Trace 2: $W_2 = \underline{\hspace{2cm}}$, $L_2 = \underline{\hspace{2cm}}$, & $Z_{0,2} = \underline{\hspace{2cm}}$.
 Trace 3: $W_3 = \underline{\hspace{2cm}}$, $L_3 = \underline{\hspace{2cm}}$, & $Z_{0,3} = \underline{\hspace{2cm}}$.
- 5) The expected theoretical resistor values are:
 $R_{1,\text{theory}} = \underline{\hspace{2cm}}$, $R_{2,\text{theory}} = \underline{\hspace{2cm}}$, and $R_{3,\text{theory}} = \underline{\hspace{2cm}}$.
- 6) The measured resistor values are:
 $R_{1,\text{meas}} = \underline{\hspace{2cm}}$, $R_{2,\text{meas}} = \underline{\hspace{2cm}}$, and $R_{3,\text{meas}} = \underline{\hspace{2cm}}$.
- 7) Expected center frequency f_c , low frequency f_{low} , and high frequency f_{high} of:
 $f_c = \underline{\hspace{2cm}}$, $f_{\text{low}} = \underline{\hspace{2cm}}$, and $f_{\text{high}} = \underline{\hspace{2cm}}$ (enter n/a if not applicable)
- 8) Predicted $[S]$ -matrix at f_c or a representative frequency: $[S] = \underline{\hspace{2cm}}$
- 9) Is the device lossless? Yes / No (circle)
- 10) Suggested test plan to confirm theories