Bridge_T_Attenuator

Where To Find This Example

AWR Version 14

Download Project

Understanding AWR .emz Files

AWR Version 13

This example was renamed since the previous version. Please see Previous Example Page for the version 13 page.

Design Notes

BRIDGE-T ATTENUATOR

This project shows a variable bridge-T attenuator implemented with ideal resistors.   It demonstrates how to access a data file which contains a table of resistor values for various attenuation states. This method of using a state table to set element parameters can be used for other variable circuits such as phase shifters.

Overview

The "Bridge_T" schematic contains the attenuator design. In it, the two resistors labeled "R1" and "R4" determine the attenuation of the circuit. The values of "R1" and "R4" are specified as a matrix in the data file "Resistor_Values", and are easily varied by changing the variable "state" which corresponds to the attenuation states.

Referencing the Data File

The matrix represented by the data file "Resistor_Values" is assigned to variable "dfile" in the schematic "Bridge_T" using the **DataFile()** function:

dfile = DataFile("Resistor_Values")

Each row of the "dfile" matrix represents an attenuation state, and can be assigned to another variable "Rvector" using the **row()** function:

Rvector=row(dfile,state)

where "state" is an index variable corresponding to the row position in the matrix. The values of "R1" and "R4" correspond to the third and fourth column "dfile", and also correspond to the third and fourth element of "Rvector" for each "state":

R1 = Rvector[3]

R2 = Rvector[4]

By simply changing the value of "state", the values of "R1" and "R4" are both changed concurrently.

See **Text Data File Format** in the Data Files Chapter of the MWO/AO/VSS User Guide for more information regarding the data file format.
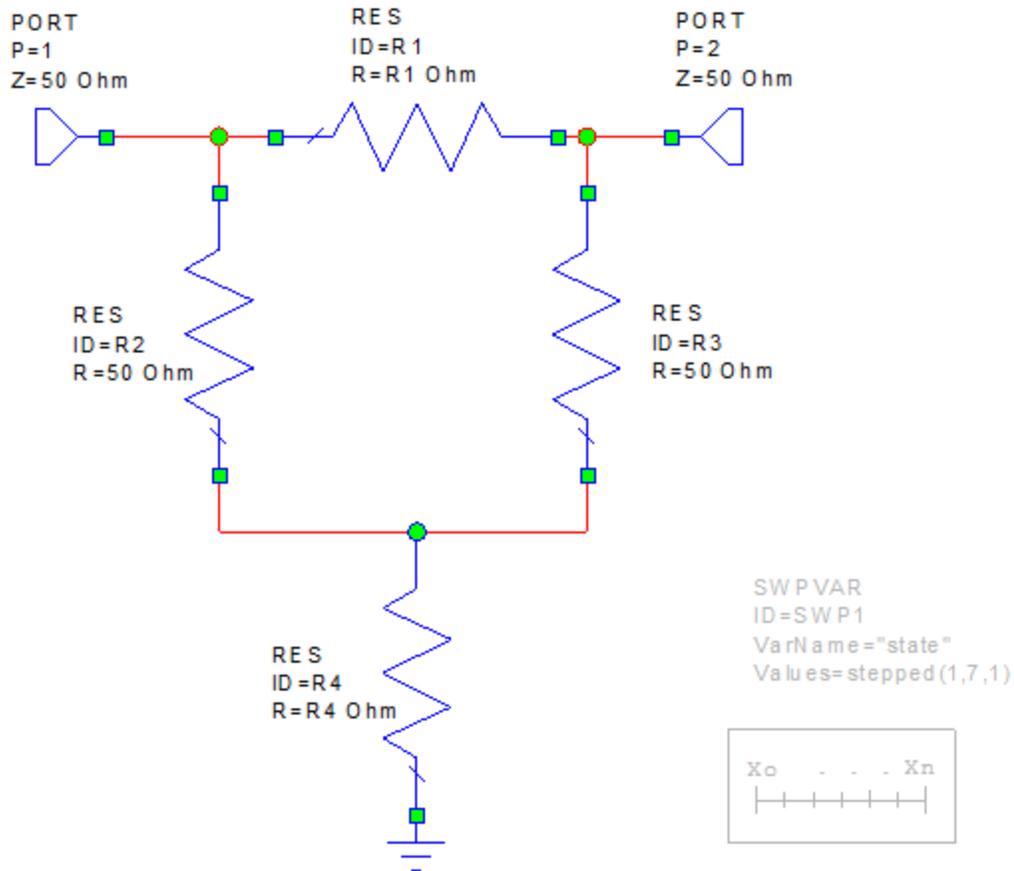
Simulation

The attenuation results for "state=5" is plotted on graph "Attenuation". To see results for all attenuation states, enable the SWPVAR element.

Schematic - Bridge_T

```
dfile=DataFile("Resistor_Values")

state=5

Rvector=row(dfile,state)

R1=Rvector[3]=450 R4=Rvector[4]=5.6
```

PORT P=1 Z=50 Ohm	RES ID=R1 R=R1 Ohm	PORT P=2 Z=50 Ohm

RES
ID=R2
R=50 Ohm

RES
ID=R3
R=50 Ohm

RES
ID=R4
R=R4 Ohm

SWP VAR
ID=SWP1
VarName="state"
Values=stepped(1,7,1)

Xo . . . Xn

Graph - Attenuation