

Josh Anderson

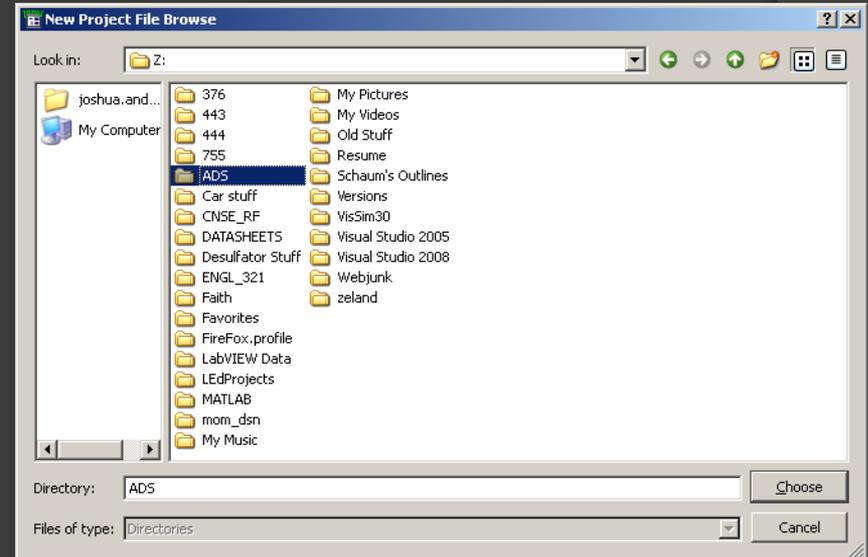
COSIMULATION IN ADS

Why use Cosimulation?

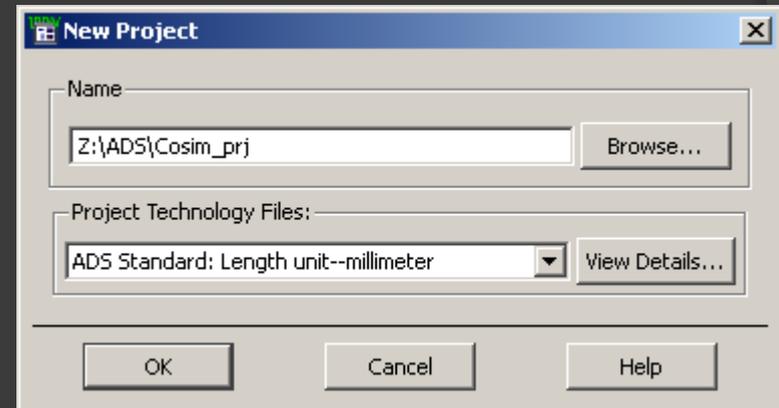
- Enables users to create physical parts and add them to a circuit simulation.

Getting Started

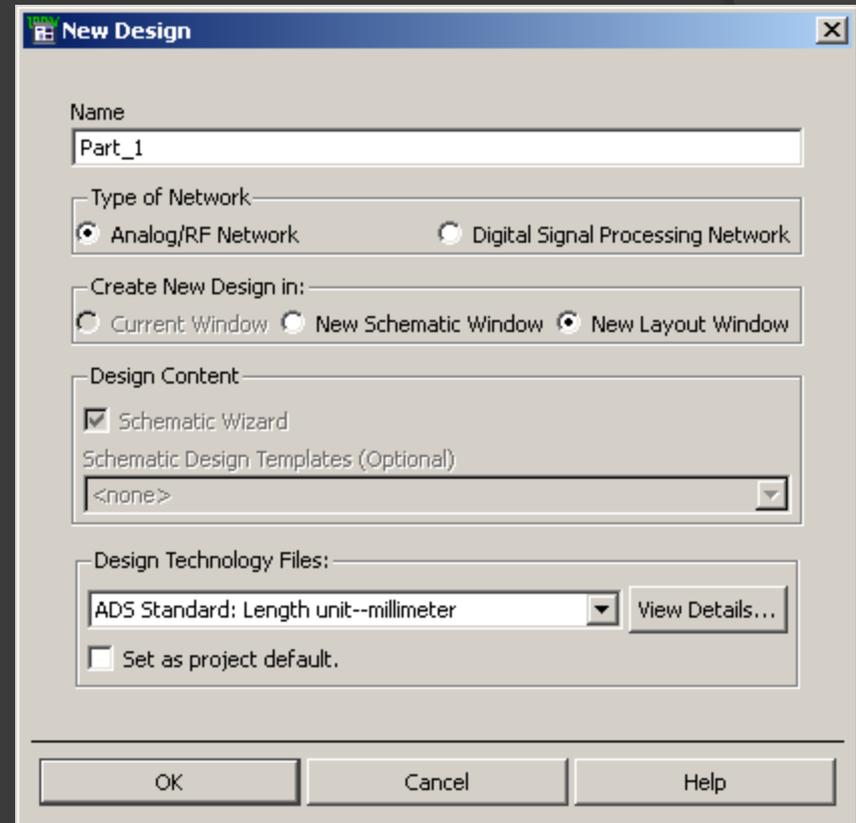
- Open ADS
- Click “Create a New Project”
- Click “Browse” and, starting with My Computer/Z:/ browse to the folder where your ADS project will be stored.
- Note that going straight to the “My Documents” path without going through My Computer will cause future problems
- Click the Choose button

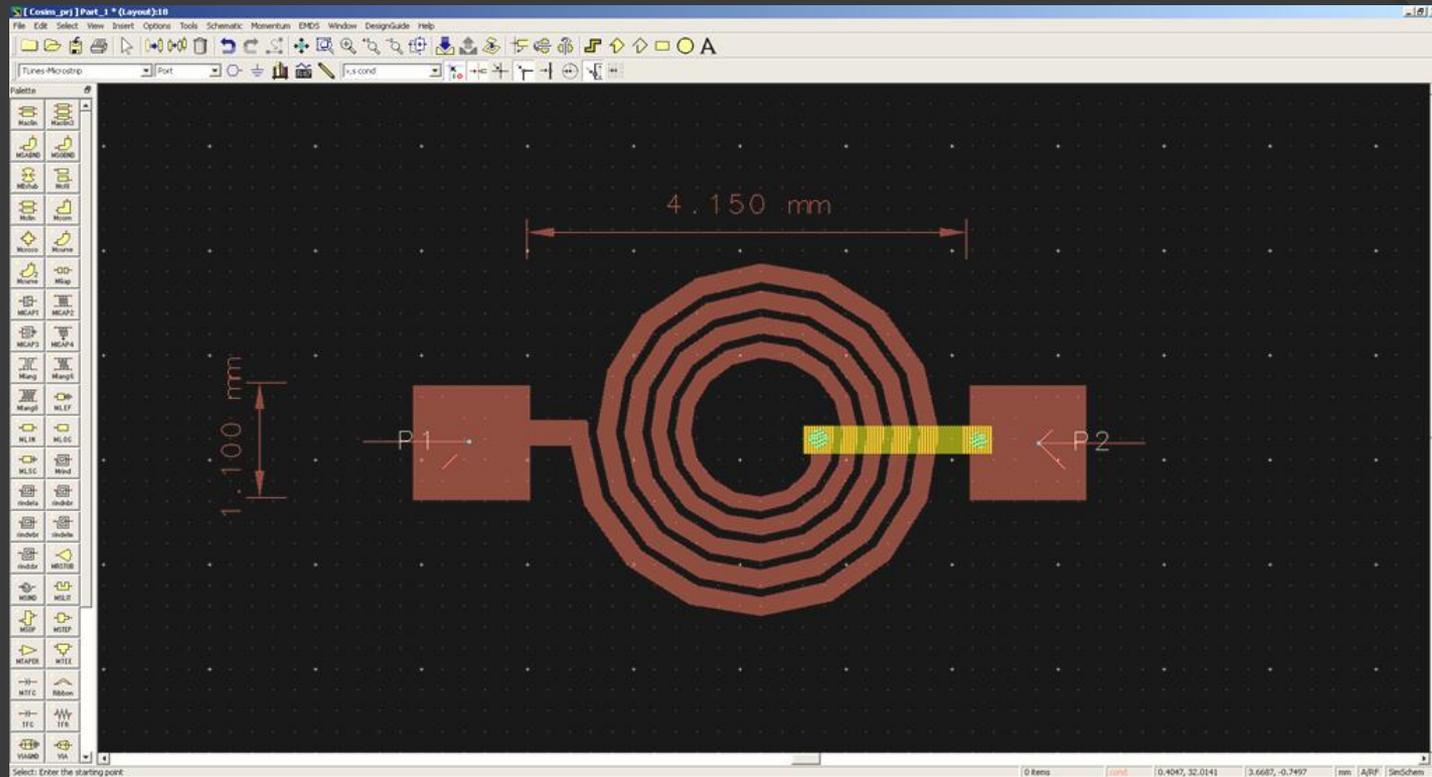


- Name the title of your project in the New Project box
- Be sure to include “_prj” at the end of the project name.
- This will create a directory within the directory that you previously chose. All information for this particular project will be stored in that directory.
- Click OK
- Close the schematic wizard box
- Name and save the schematic and close for now.



- Create a new design
- This will be a design for a part that you will be creating so be sure to name it accordingly
- Be sure to select “New Layout Window” before clicking OK. Otherwise a new schematic will be opened.

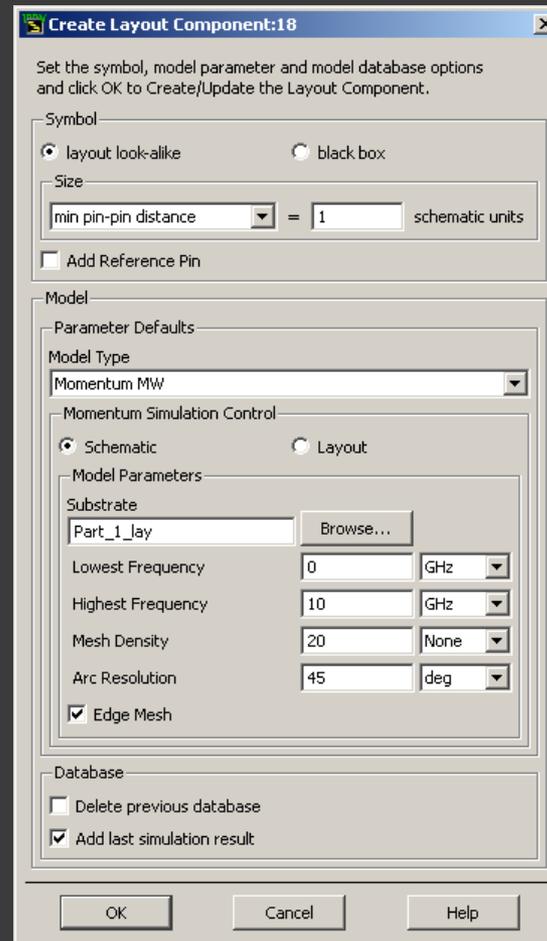




- Create a part as you normally would using the ADS design layout.
- In this case the part is a spiral inductor on FR-4
- Create and modify the substrate as you normally would
- Place ports on each end of the component
- Note that parts can have more than just two ports to be used in the schematic

Create the Component

- Now that you have created the physical component and given the correct substrate parameters, the component can be made.
- Click Momentum, Component, Create/Update
- A configuration box will appear



- A layout look-alike will be created. What will happen is the layout object will be scaled based on the smallest distance between any of the pins and the number of schematic units the user chooses.
- Choose the model type, set simulation control to schematic. (This means the simulation will be run entirely from the schematic window)
- Choose the correct frequency range that this component will be used on. (This allow ADS to correctly model the component you have made)

Create Layout Component:18

Set the symbol, model parameter and model database options and click OK to Create/Update the Layout Component.

Symbol

layout look-alike black box

Size

min pin-pin distance = 1 schematic units

Add Reference Pin

Model

Parameter Defaults

Model Type

Momentum MW

Momentum Simulation Control

Schematic Layout

Model Parameters

Substrate

Part_1_lay Browse...

Lowest Frequency 0 GHz

Highest Frequency 1 GHz

Mesh Density 20 None

Arc Resolution 45 deg

Edge Mesh

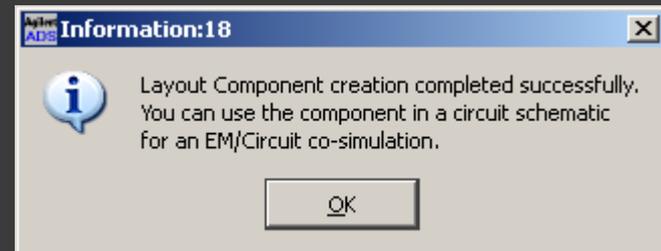
Database

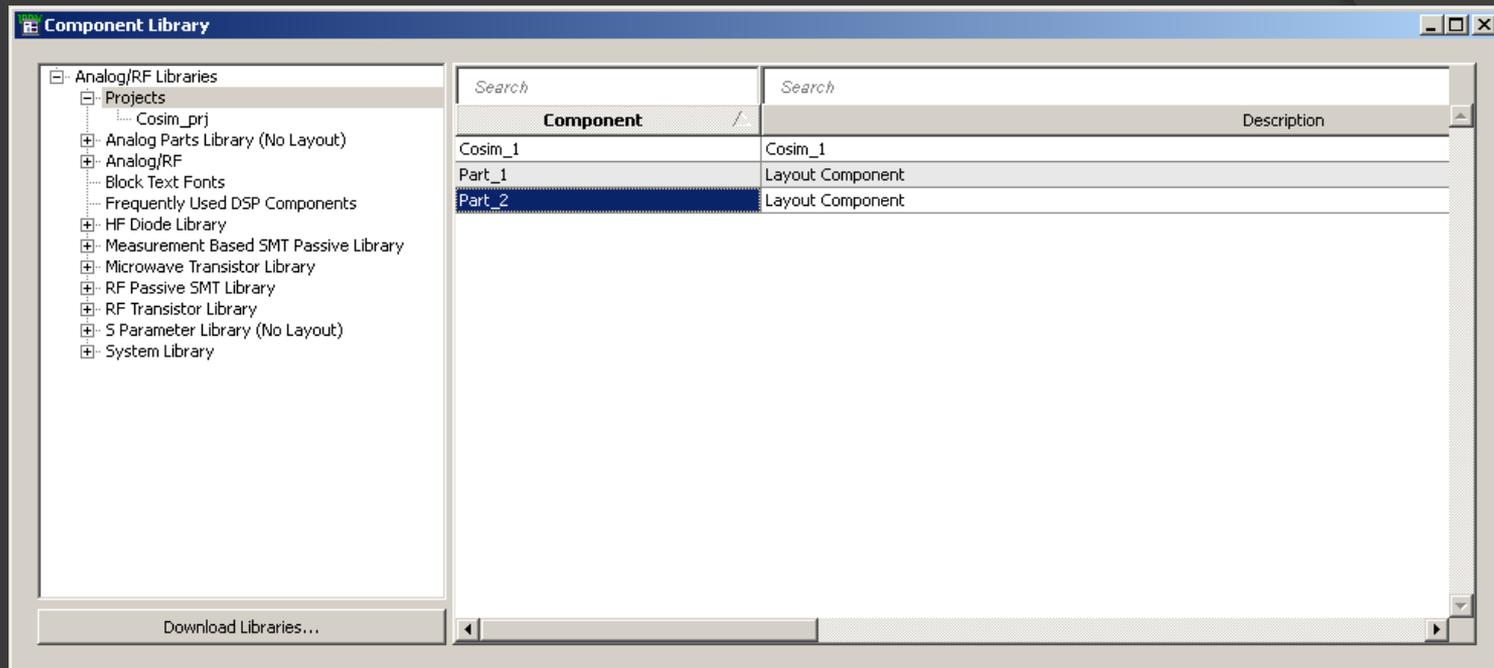
Delete previous database

Add last simulation result

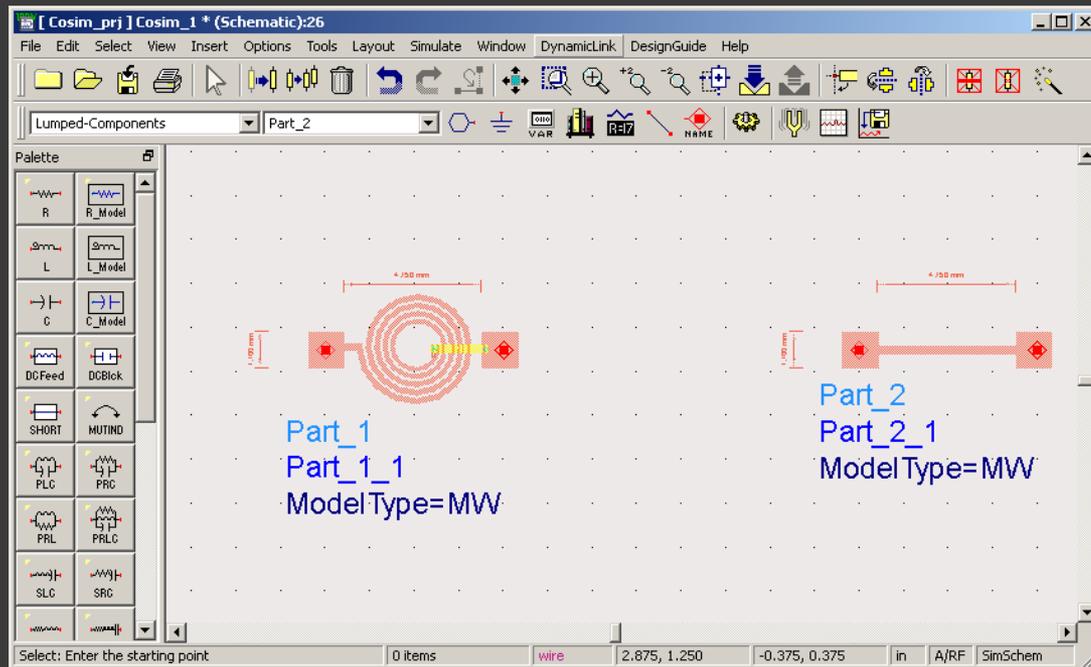
OK Cancel Help

- Click OK and you should see this window.



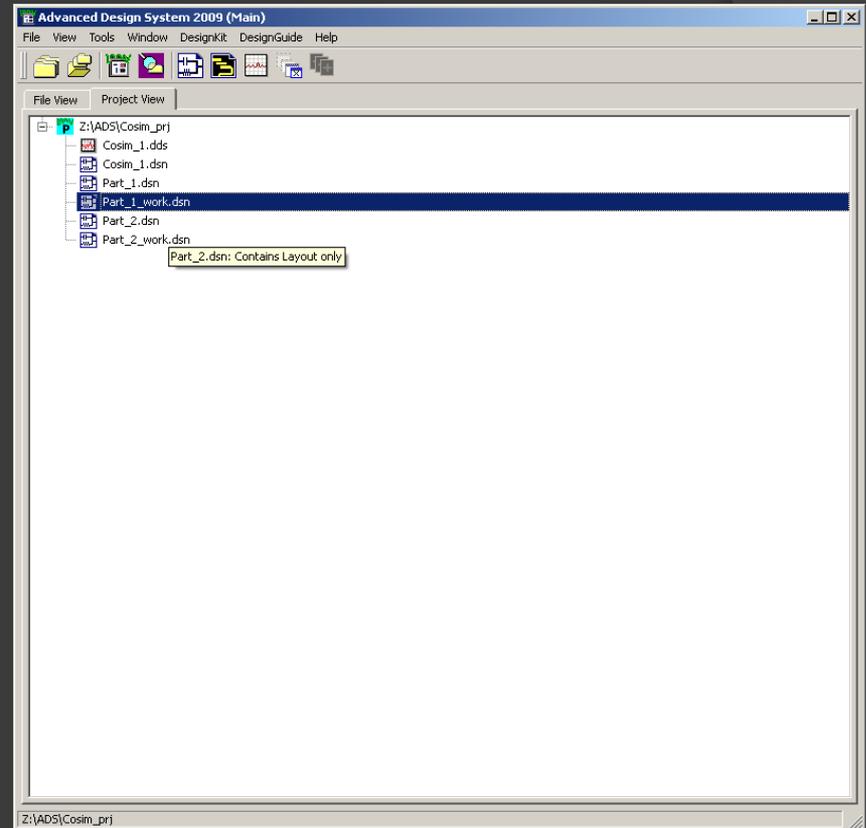


- Open the schematic that was created earlier
- Your component can be placed by following Insert, Component, Component Library, Projects
- Your part name should be in this directory
- Click and drag your part on to the schematic. In this case another part was created using the same method and placed on the schematic.

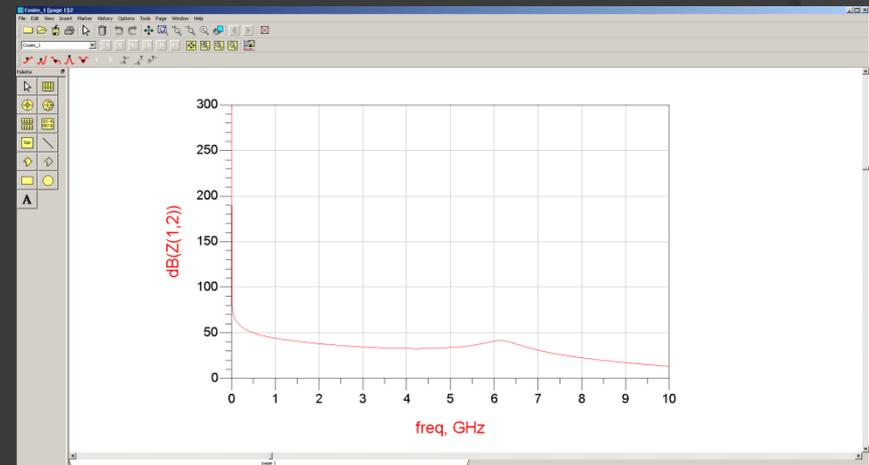


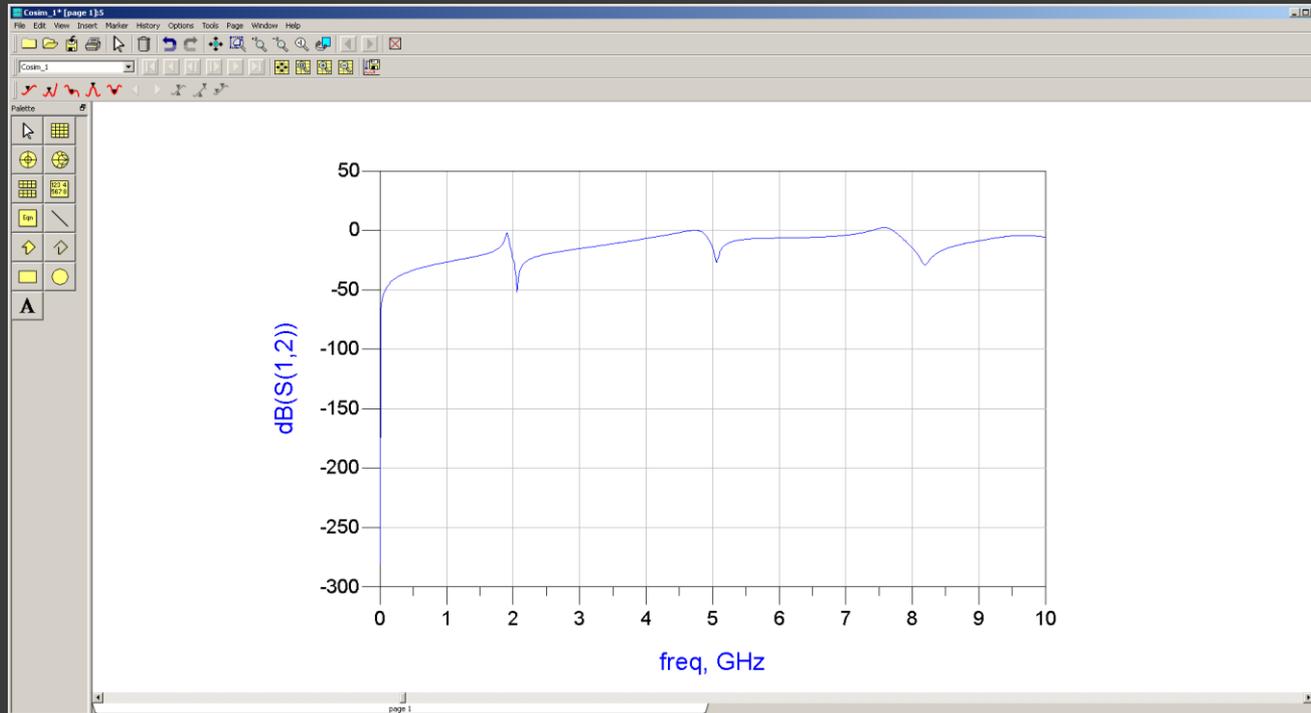
- Add any other needed components and connect everything.

- ADS will create a new design for each part. It will show up in the project directory as “(part name)_work.dsn”
- This is where the parameters of the component are calculated and used by the schematic.
- You may need to go into this design and change the S-parameters for a higher accuracy
- To do this, just simply run Momentum like you normally would.

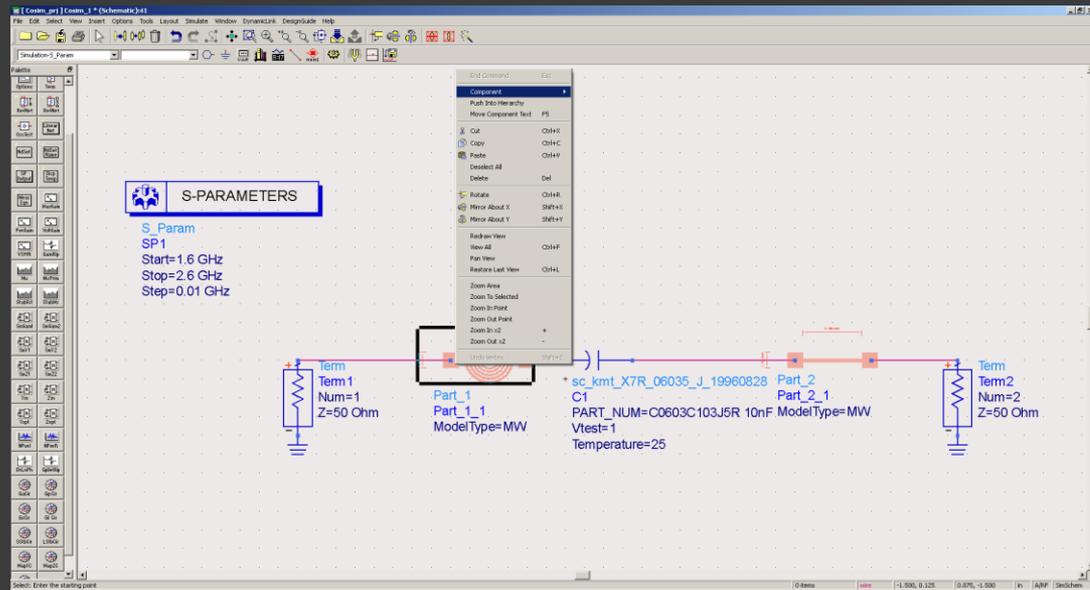


- In this scenario, the first sweep was only run to 1 GHz
- It was found that nothing interesting was happening at a frequency this low
- Changing the sweep parameters in the schematic caused problematic results because the parts were only defined for frequencies up to 1GHz.
- By right-clicking on each component in the schematic and editing component parameters, the upper frequency limit was changed for better results.
- Shown to the right is the results of a 0 to 10GHz frequency sweep where the components were only defined up to 1GHz

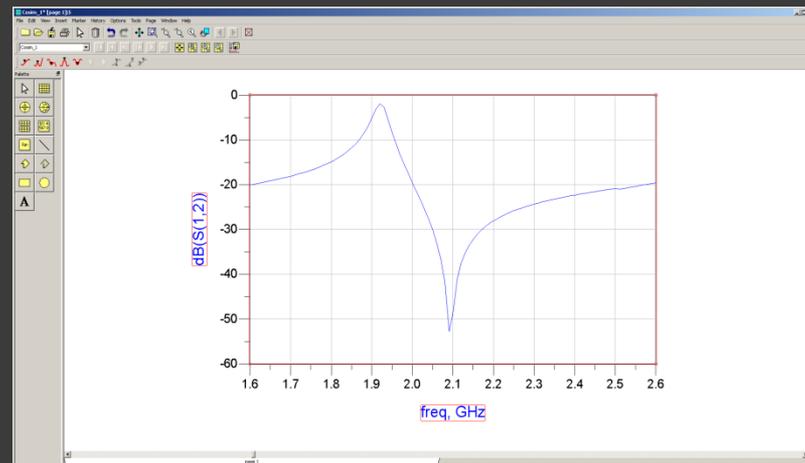




- Defining the components for up to 10GHz by editing the component parameters led to these results.



- Changing the component parameters and sweep parameters to 1.6-2.6GHz gave much better results.



Now go out and have fun with ADS

THAT'S IT!