

# Custom\_Spirals

## Where To Find This Example

Select **Help > Open Examples...** from the menus and type either the example name listed above or one of the keywords below.

Or in Version 14 or higher you can open the project directly from this page using this button. Make sure to select the **Enable Guided Help** before clicking this button.

Open Install Example

## Design Notes

### Using Custom Spirals in Analog Office

It is easy to create your own custom spiral inductors within the AWR environment. The following simple steps show how to create the spiral element, characterise it and then use it in your project.

#### Creation

- 1) Create a new schematic called "**Spiral**", add two ports and connect them together with a net.
- 2) Edit each ports' properties to add the layout property **RECT\_PIN\***.
- 3) Open up the layout view. Drag one of the pins so they are no longer on top of each other.
- 4) Click on the inset rat line and draw your spiral.
- 5) Right click on the spiral and open the **Element Properties > Model Options** and check the enable box under EM extraction options.

#### Characterisation

- 1) Create a new schematic called "**Spiral Test**".
- 2) Click on the elements tab and look under subcircuits. Here you will find the subcircuit called Spiral. Add it to your schematic.
- 3) Add ports to each terminal.
- 4) Add an extract block from the simulation control element tree and set the simulator to **AXIEM**.
- 5) Change the cell size in the extract block to 0.5um x 0.5um.
- 6) Double click on the Extract block and select the Mesh tab. Turn off "Model as zero thickness".
- 7) Add a graph called inductance and to that graph add the measurement L\_SRL from the linear measurements.
- 8) Add another graph called Q and to that graph add the measurement Q\_IN2 from the linear measurements.
- 9) Set the project frequencies then run your simulation. The simulation will now run plotting the Inductance and Q over frequency.

#### Use

There are a number of different approaches that can be taken in the AWRDE to use these custom spirals depending upon what the users requirements are.

**Option 1** is to simply use the device as is within your project. It can be used multiple times within that project by selecting it from the subcircuits menu. It will be extracted each time a simulation is run.

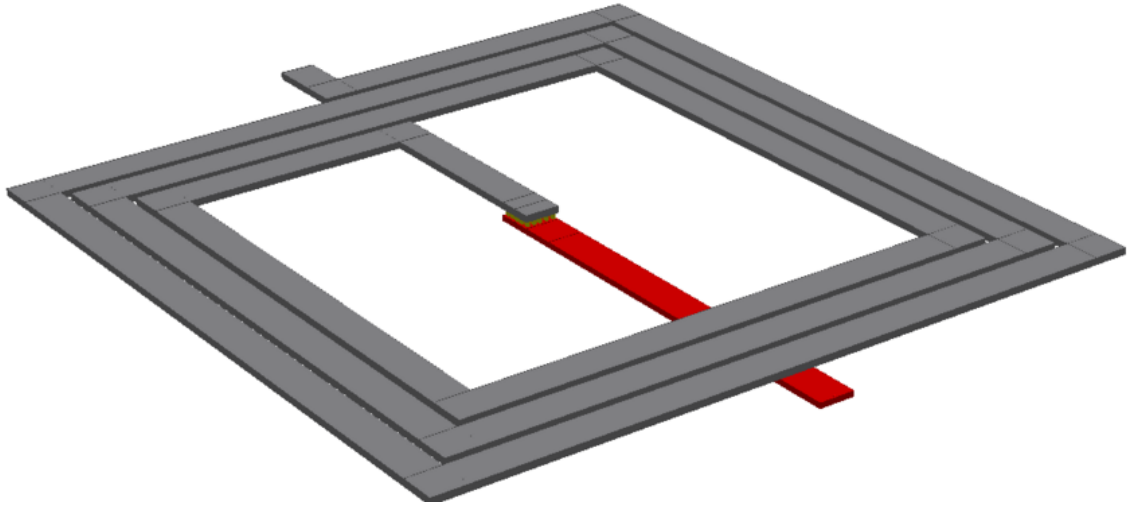
**Option 2** is to create an s-parameter file by right clicking on **Output Files > Add Port parameter File**. This s-parameter file can then be imported and used as a model for the spiral so no further extractions of the spiral are carried out during simulations. This s-parameter file can easily be imported into other projects. Similarly the GDSII can also be exported and then imported into new projects.

**Option 3** is to make an s-parameter model then generate an xml component linking symbol, layout, s-parameter model together as an element in the users own custom library. See the Knowledge base for information on creating custom XML components.

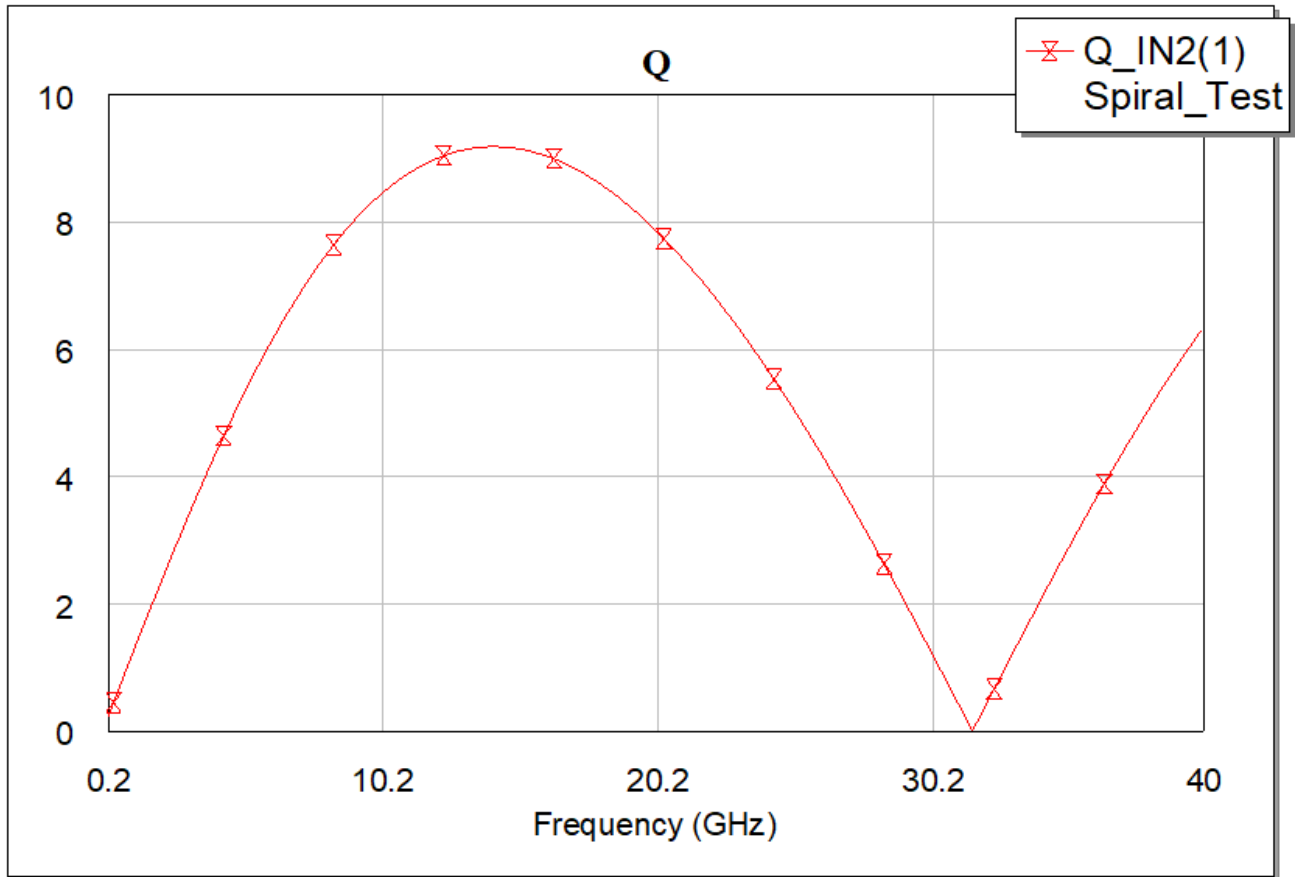
## Schematic Layout - Spiral



Schematic 3D Layout - Spiral



Graph - Q



Graph - Inductance

