
Johanson Technology

*How to Simulate Johanson Technology
Baluns in GENESYS 2009.04*

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■ Tools Required

- GENESYS 2009.04 (or equivalent)

- Download *.snp file from

- <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-baluns.html>

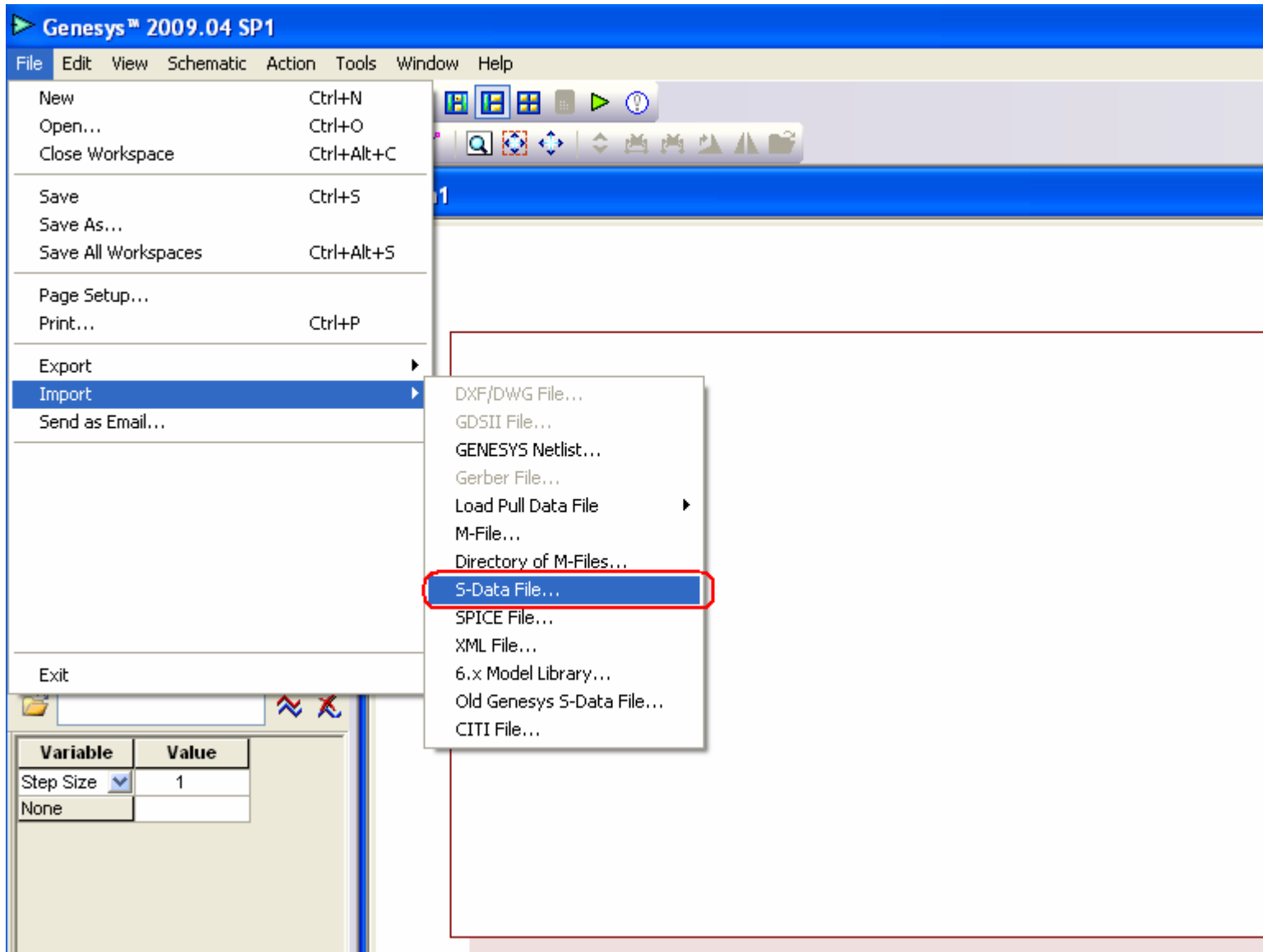
- <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-baluns.html>

- <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-balun-filter-combos.html>.

■ This tutorial

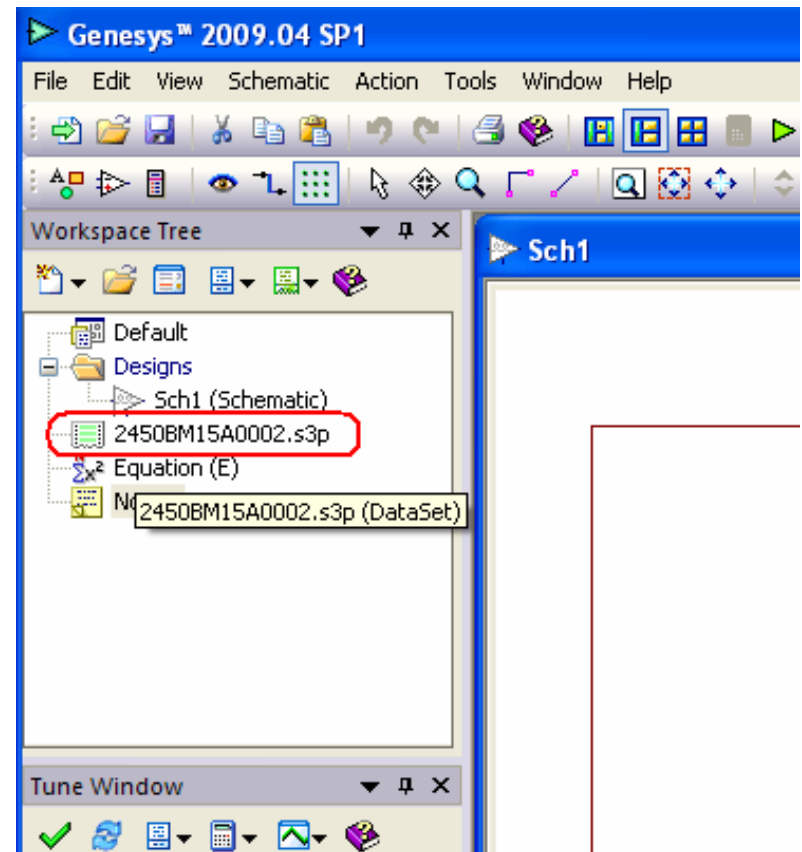
- For this example, the Johanson Technology Matched Balun 2450BM15A0002 will be used.
- Download the s-data file on <http://www.johansontechnology.com/images/stories/s-param/Baluns-Matched/2450BM15A0002/2450BM15A0002.s3p>
- Save in c:\...<some path>

Launch GENESYS 2009.04 and Import S-Data File...



Verify .s3p file

- If import was successful, a dataset named 2450BM15A0002.s3p is now in the workspace tree

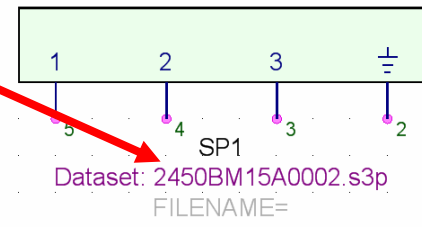
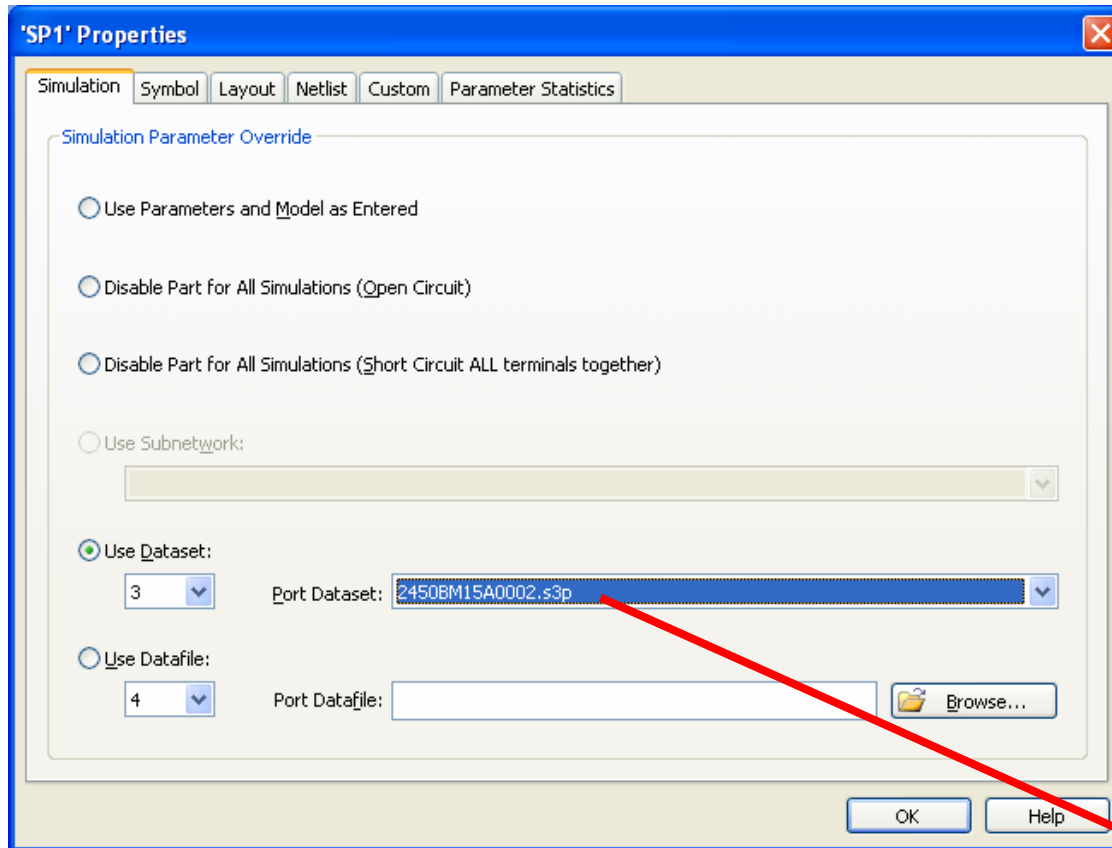


- Using Parts Selector A
 - 3-Port Data File (S-Parameter)
 - THR
 - Transformer. Parameters: Primary, Secondary, Conditioning Factor
 - TRF
 - Center-Tapped Transformer. Parameters: Primary, Top Secondary, Bottom Secondary
 - TRFCT

- Double Click on 3-Port Data File Block
- Click on Advanced Option (bottom left)
- In the Simulation tab, select the “Use Dataset” radio button
- Adjust the number of ports to 3 from the drop down menu
- Ensure the Port Dataset is the 2450BM15A0002.s3p
- Verify screenshot next slide

Verify Port Block is Configured Correctly

- Should look something like this:



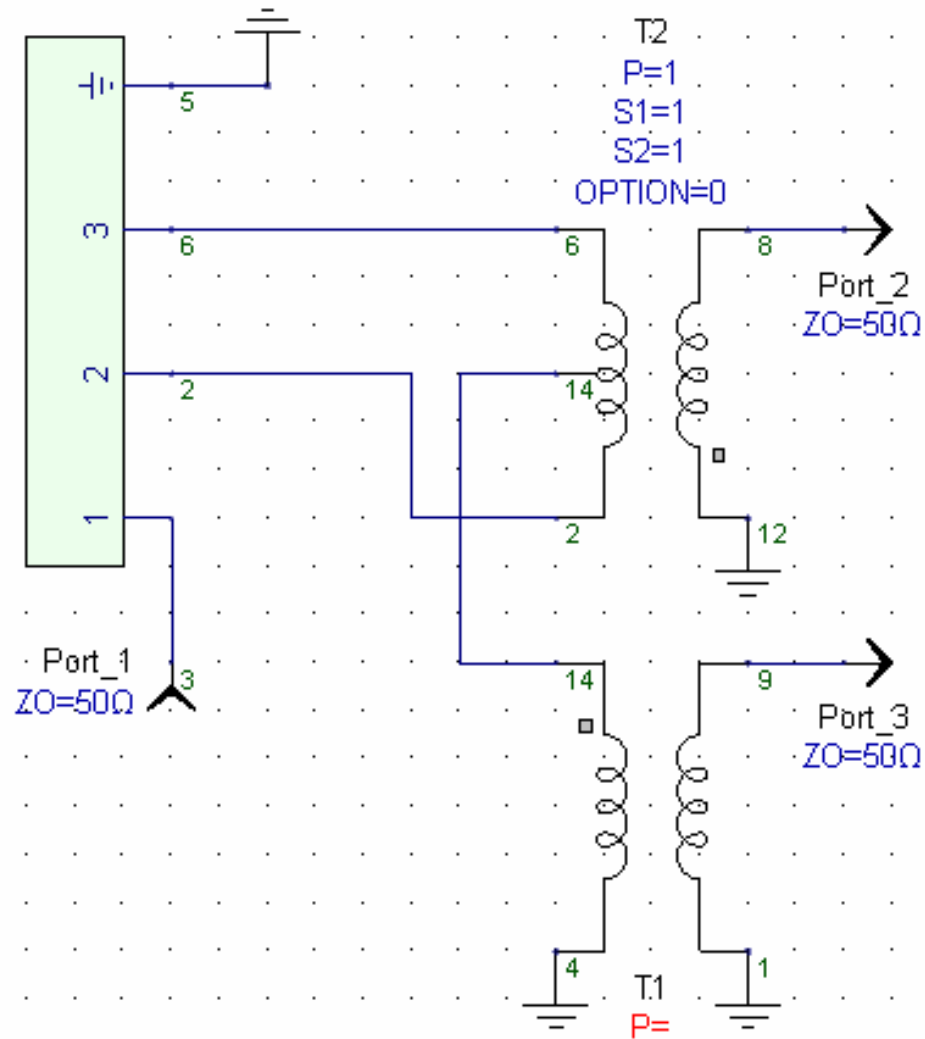
- Click "OK" in SP1 Properties

Configure Circuit with Topology Shown Below

SP1

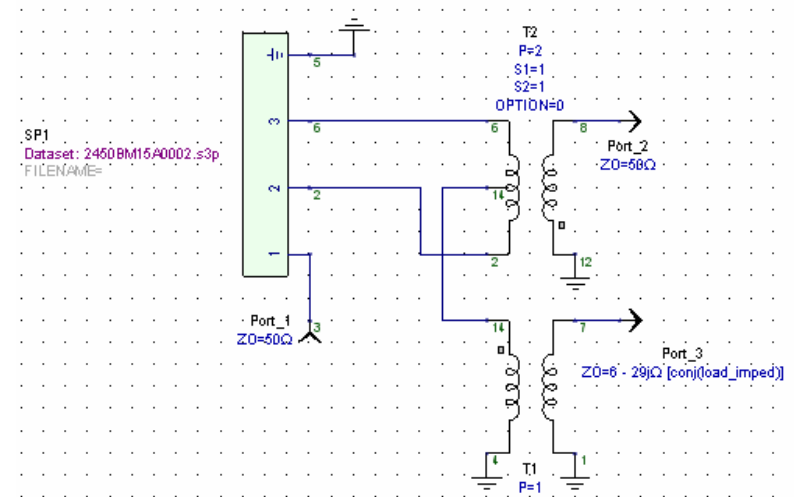
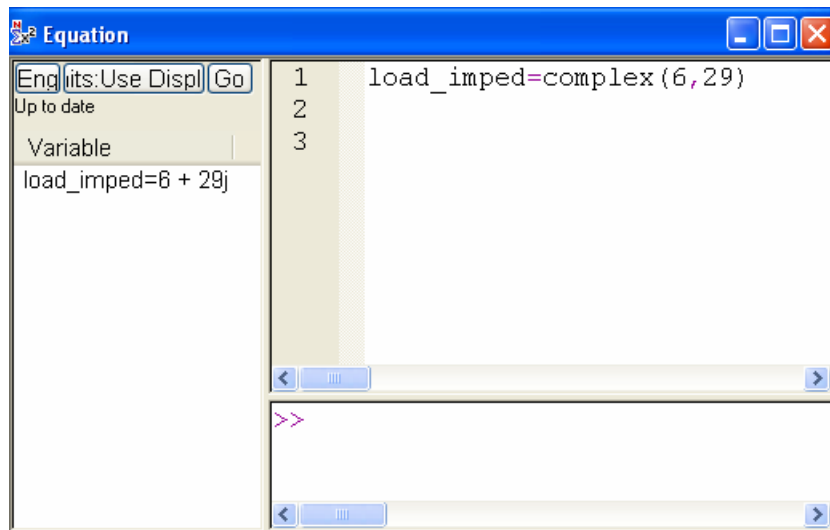
Dataset: 2450BM15A0002.s3p

FILENAME=



Create variable in equation

- Create a variable “load_imped”
- Use ‘conj’ to conjugate and implement in port 3



Configure Transformers

- Double Click on T2
 - Change “P” value to 2 and OK out
- Double Click on T1
 - Select “Use Default” for P, OK out

'T2' Properties

Designator: T2 Show Designator

Description: Center-Tapped Transformer. Parameters: Primary, Top Secondary, Bottom Secondary

Model: TRFCT Show Model

Manage Models... Model Help Use Model

Name	Value	Units	Default	Use Default	Tune	Show
P	2	()	1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S1		()	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S2		()	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
OPTION		()	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Parameter Options Browse... OK Cancel Help

'T1' Properties

Designator: T1 Show Designator

Description: Transformer. Parameters: Primary, Secondary, Conditioning Factor

Model: TRF Show Model

Manage Models... Model Help Use Model

Name	Value	Units	Default	Use Default	Tune	Show
P		()	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S		()	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPTION		()	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Parameter Options Browse... OK Cancel Help

Add Linear Analysis Ranging from 800-9000 MHz

Linear Analysis Properties

Name:

Design:

Dataset:

Description:

DC Analysis:

Frequency Units:

Calculate Noise

Automatic Recalculation

Frequency Range

Start: MHz

Stop: MHz

Advanced

Gmin:

Preferred Reduction Size:

Temperature:

Type Of Sweep

Linear: Number of Points:

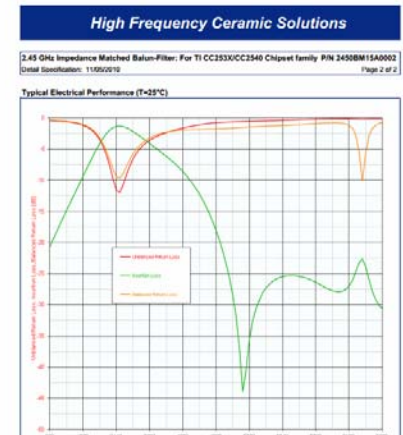
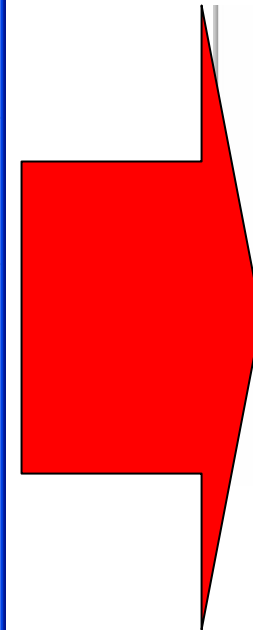
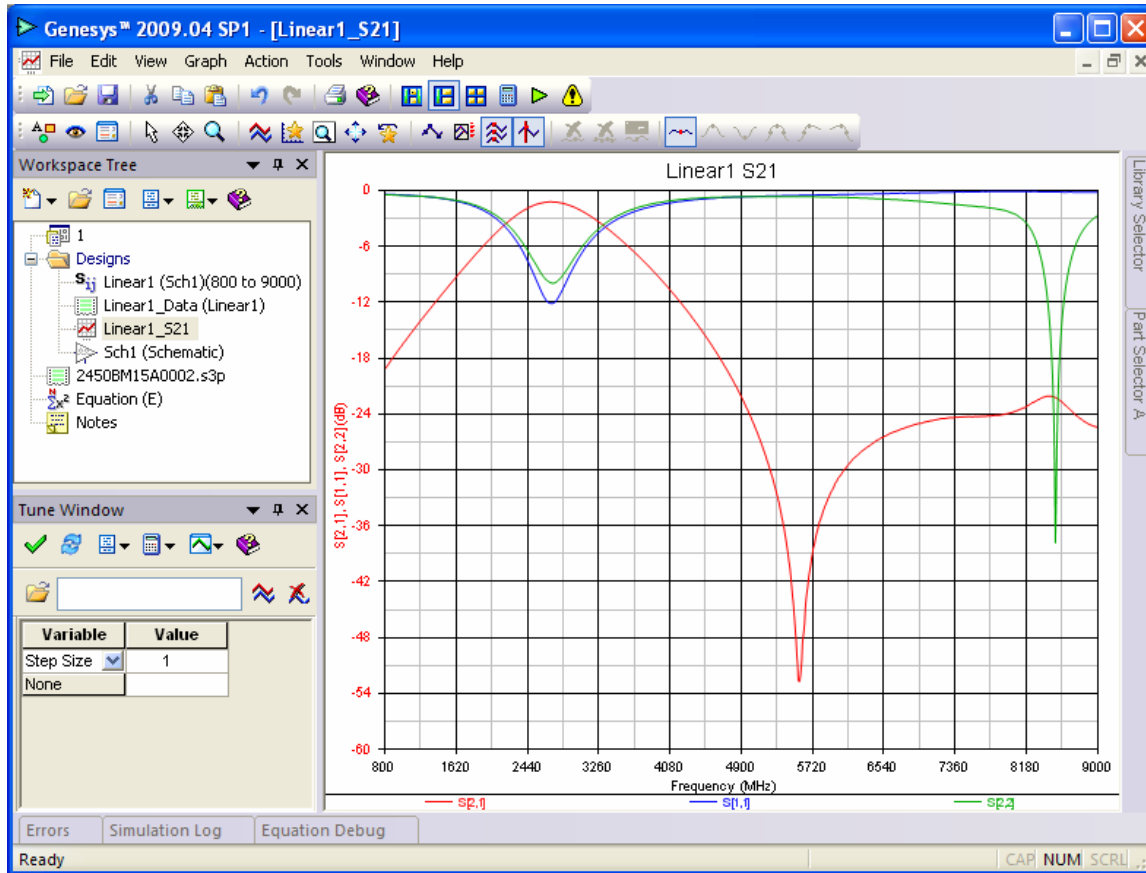
Log: Points/Decade:

Linear: Step Size (MHz):

List of Frequencies (MHz):

Simulate and Plot

■ Plotting S11, S21 and S22



- Using Johanson Technology s-data, a differential signal has been transformed into a single ended signal referenced to ground. Parameters such as insertion loss and filtering is represented by the s-parameter file which is extracted from a production part.

- Johanson Technology Reference Design balun
 - <http://www.johansontechnology.com/en/integrated-passives/chipset-specific-baluns.html>
- Texas Instruments CC2530 Datasheet
 - http://www.ti.com/ww/en/analog/cc2530/index.shtml?DCMP=hpa_rf_cc2530&HQS=NotApplicable+PA+cc2530
- Agilent GENESYS EDA Simulator
 - <http://www.home.agilent.com/agilent/product.jsp?cc=US&lc=eng&ckey=1297125&nid=-34275.0.00&id=1297125>