

# Time\_Frequency\_Compare

## 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

### Time and Frequency Domain Comparison

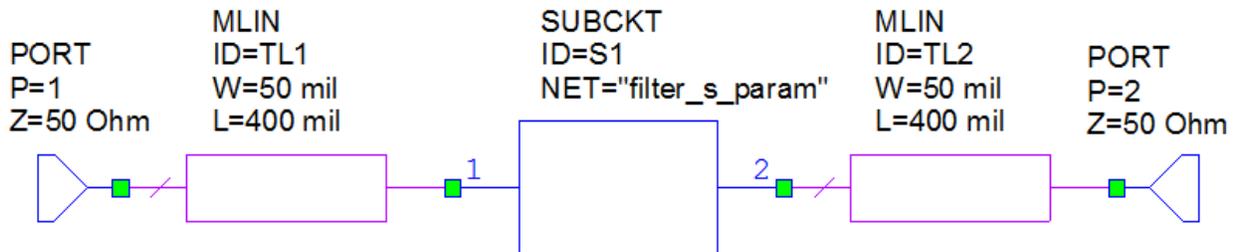
This project demonstrates the ability to check how passive frequency domain models in a design will behave in the time domain.

#### Overview

Before simulating in the time domain it is often useful to check and see how the passive frequency domain models in a design will behave in the time domain. In AWRDE this comparison is very simple and involves duplicating the small signal frequency domain test bench and then using a special simulation option. **Note that this technique only works with passive frequency domain models and that the simulations must use the APLAC simulator.** The Linear > PASSIVE measurement can be used to confirm the passivity of the circuit. To compare active frequency domain models (e.g. s-parameters of a transistor) it is necessary to use time domain simulation and nonlinear measurements. Please contact AWR Support for additional detail.

#### Filter Schematic

Contains a passive filter design with MLIN models and an s-parameter file.

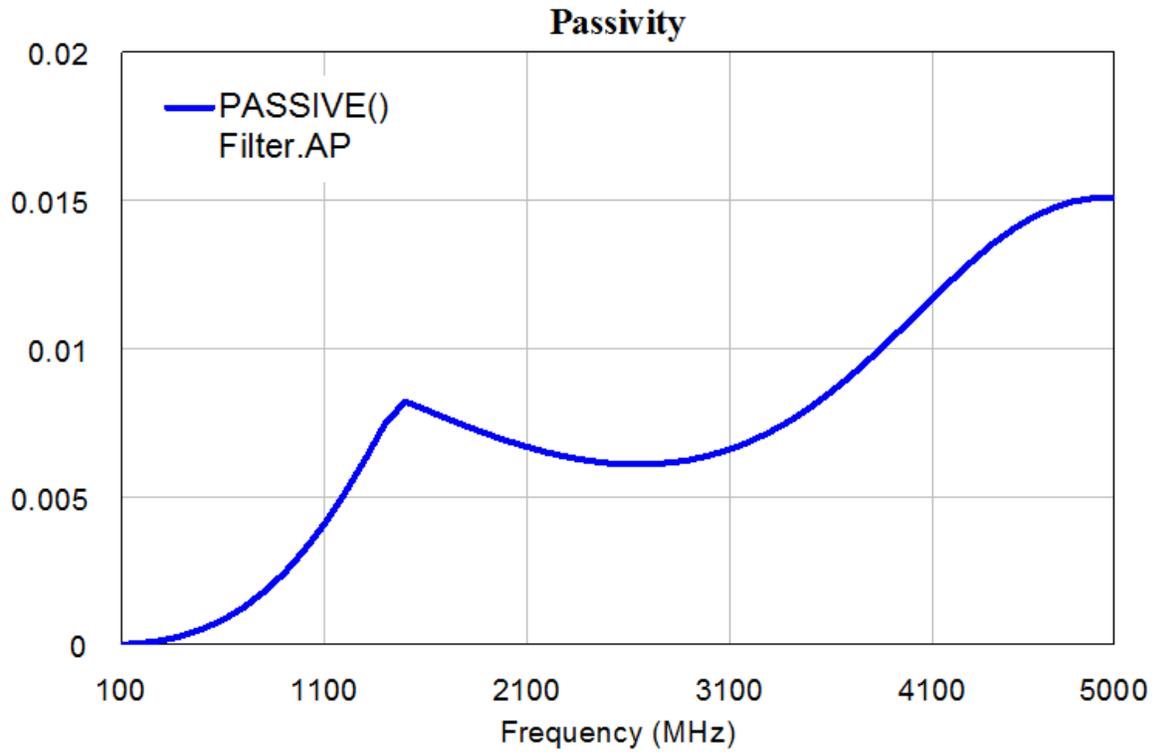


#### Filter\_TD Schematic

Contains the same passive filter as the Filter Schematic but uses the Free Text=NETLIST\_TD APLAC Simulation Option. The Free Text option is set by right clicking on the Filter\_TD Schematic > Options > APLAC Sim. Click the Show Secondary button and scroll down to the Miscellaneous Options Category. The NETLIST\_TD option causes models to be mapped to the time domain (even though the simulation is performed in the frequency domain).

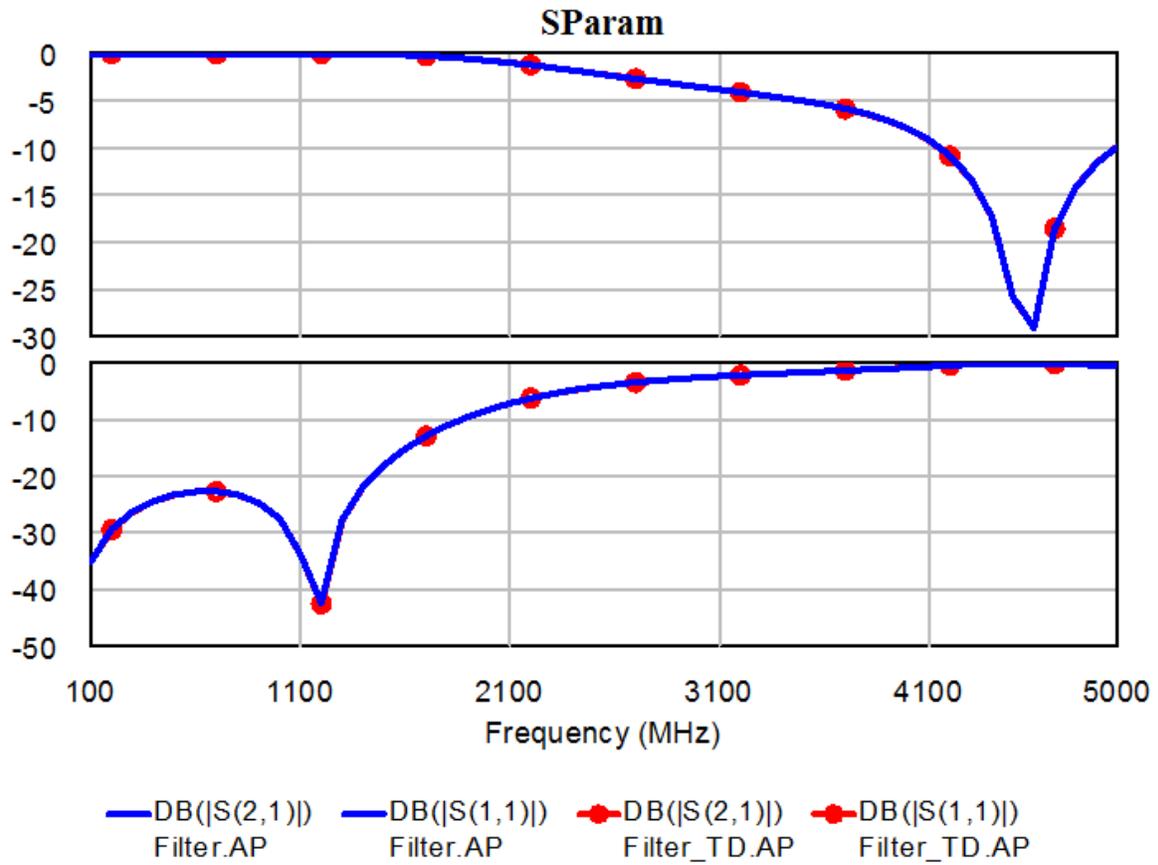
#### Passivity Graph

Uses the PASSIVE Measurement to confirm that the Filter Schematic is passive.



#### SParam Graph

Compares  $S(2,1)$  and  $S(1,1)$  from the Filter Schematic (blue) and the time domain representation of the Filter Schematic (red).



#### SModel Graph

Uses the SModel Measurement to compare the Filter schematic to the time domain representation of the Filter Schematic. The -100 dB match is an almost perfect match. Read the SModel help doc for more details.

### SModel

