Matlab functions - tsnpimport and tsnpimporti

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Description

tsnpimport (Touchstone network parameter import) function imports S,Y,Z and other network parameters from Touchstone V1.1 files. The function tsnpimporti is built upon tsnpimport with targeted applications in signal and power integrity. Specifically, tsnpimporti omits the RF noise data and also has simplified data formats.

tsnpimport

```
function [tsnp, err, errmsg] = tsnpimport(fxnp,varargin)
% (c) Jianhua Zhou 2010,2011, 2012, 2013, 2014
%
% Description: imports a touchstone file and populates the TSNP struct
%
% fxnp: Touchstone file to be loaded, can be S, Y, Z, H, G parameters
%
% output:
% TSNP: (struct) contains imported network parameter data
%     d1: data matrix, first half, dimension (nport, nport, nfreq)
%     d2: data matrix, second half, dimension (nport, nport, nfreq)
%     dn: data matrix, noise, dimension nnfreq * 4
%     nport: (integer) number of ports
%     nfreq: (integer) number of frequencies
%     nnfreq: (integer) number of noise frequencies
%     frequnit: (string) frequency unit: GHz, MHz, KHz, Hz
%     parameter: (string) S,Y,Z,H,G
%     format: (string) MA, DB, RI
%     R: (double) reference impedance, must be a real number of type
double
%
%     freqlist: list of frequencies
%     nfreqlist: list of frequencies for noise parameters
% err: (integer) indicating error condition:
%      0: no errors, with or without warnings
%      >0 : fatal error, abnormal exit of function, no output is
produced
% errmsg: a string containing log messages, error and warning messages
```

The function tsnpimport is the raw and original Touchstone import function. It returns all data as they are stored in the Touchstone file. None of the data is converted. For example, the data format is kept as is, which could be MA, RI or DB; the frequency unit is kept as is, which could be Hz, KHz, MHz, GHz. The RF noise data is retained.

tsnpimporti

```
function [tsnp, err, errmsg] = tsnpimporti(fts, varargin)
% (c) Jianhua Zhou 2012, 2013, 2014
%
% Description: imports network parameters in Touchstone file,
%              returns the S,Z,Y and other allowable network parameter data
in tsnp struct.
%              noise data is ignored
% Input variables:
%   fts: (string) full path and name of Touchstone file to be imported
%   varargin: (string) in the future, this syntax can be expanded to import
%             other file formats (CITI, etc.)
%             Right now, the default is 'format', 'Touchstone'
% output:
% tsnp: (struct)  imported network parameter data
%     data: (complex) network parameter data matrix of dimension (nport,
nport, nfreq)
%     nport: number of ports
%     nfreq: number of frequency points
%     parameter: {'S', 'Y', 'Z', etc.} allowable by Touchstone Specification
%     R: (double) reference impedance in ohm
%     freqlist: (double) list of frequencies in Hz
```

The function tsnpimporti is the modified version of tsnpimport. It is a wrapper of tsnpimport with improved and simplified formats.

First of all, the RF noise data is omitted in the return struct tsnp.

Secondly, all frequency points are converted to Hz.

Thirdly, the data matrix format is converted to RI and put in a consolidated complex matrix.

Final Notes

[1] Both tsnpimport and tsnpimporti return struct “tsnp” uses the (nport, nport, nfreq) data matrix configuration in contract to earlier version importtsi function, which uses the (nfreq, nport, nport) data matrix configuration.

[2] These functions only supports Touchstone V1.1 files.

[3] It is recommended to use tsnpimporti for all signal and power integrity applications. Importtsi can also be used for signal and power integrity applications.