802.3da
Call for Data Pair Cable Measurements

Guidelines for Submissions

Jason Potterf presenting with a lot of help from Michael Paul and Paul Wachtel
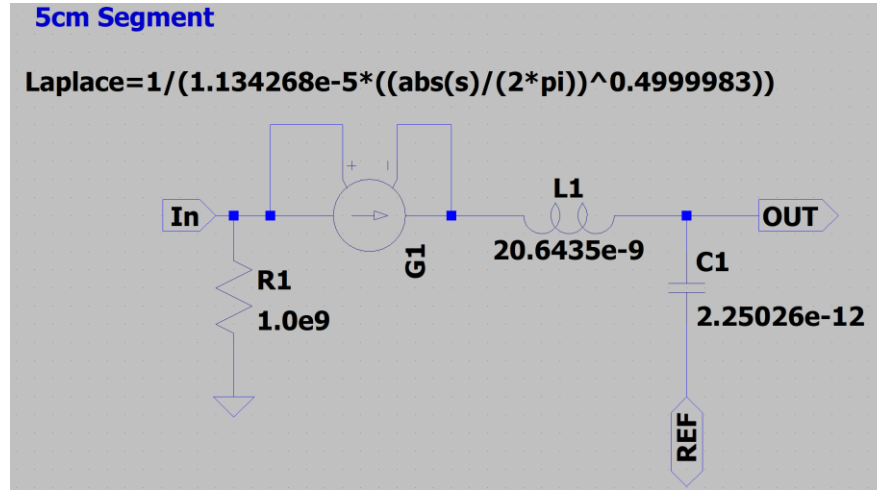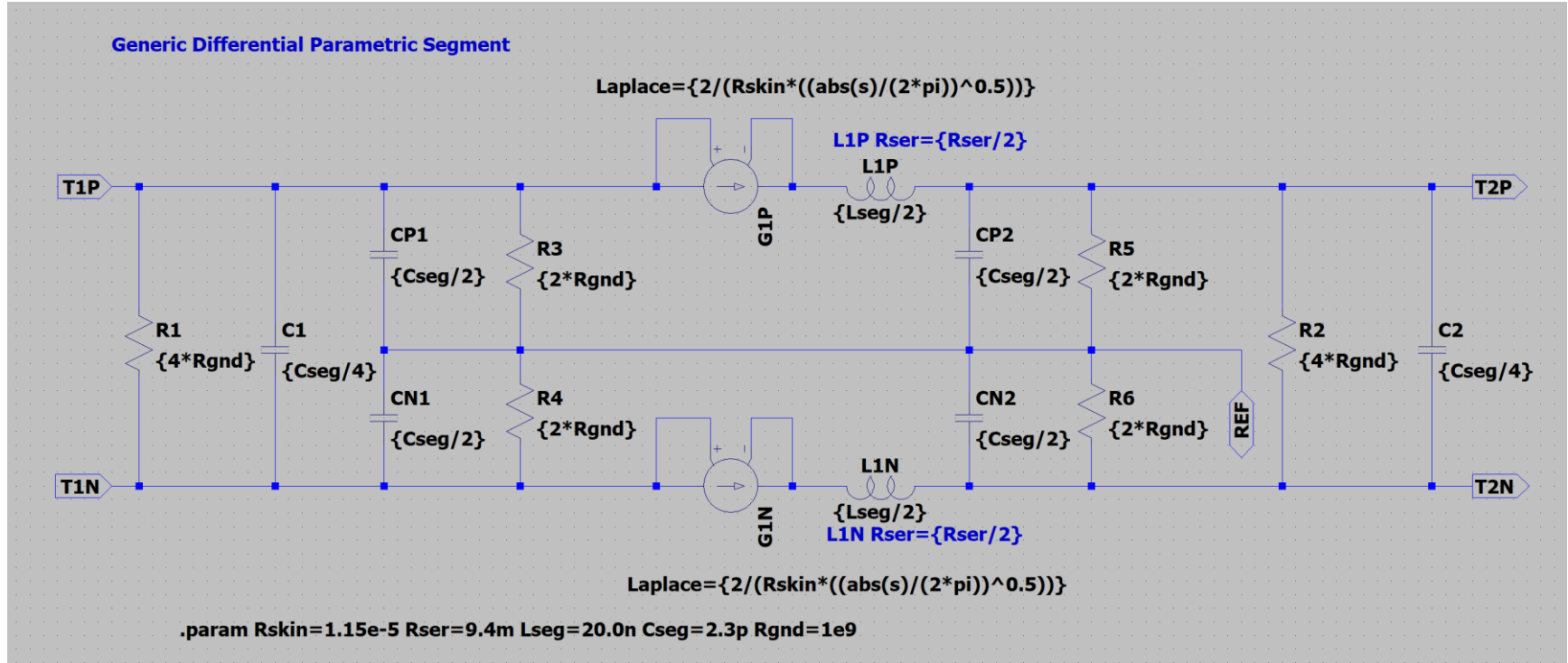Affiliated with Cisco
2022-09-14

Topics

- Cable Model
- Cable Data Formats
- Suggested Cables

Initial Cable Model

5cm Segment

Laplace=1/(1.134268e-5*((abs(s)/(2*pi))^0.4999983))

L1 20.6435e-9

R1 1.0e9

C1 2.25026e-12

In   G1   OUT

REF

Contributed to Consensus Model by Paul Wachtel

Differential Cable Model

Generic Differential Parametric Segment

Laplace={2/(Rskin*((abs(s)/(2*pi))^0.5))}

L1P Rser={Rser/2}

L1P {Lseg/2}

G1P

T1P   T2P

CP1 {Cseg/2}   R3 {2*Rgnd}   CP2 {Cseg/2}   R5 {2*Rgnd}

R1 {4*Rgnd}   C1 {Cseg/4}   R2 {4*Rgnd}   C2 {Cseg/4}

CN1 {Cseg/2}   R4 {2*Rgnd}   CN2 {Cseg/2}   R6 {2*Rgnd}   REF

L1N {Lseg/2}

G1N

L1N Rser={Rser/2}

T1N   T2N

Laplace={2/(Rskin*((abs(s)/(2*pi))^0.5))}

.param Rskin=1.15e-5 Rser=9.4m Lseg=20.0n Cseg=2.3p Rgnd=1e9

Contributed to Consensus Model by Michael Paul

Cable Model Extraction Process

- Keysight Physical Layer Test System (PLTS)
  - Can import Touchstone Format (.s4p) s-parameters data sets
  - Supports RLGC Extraction
  - See Keysight.com for gory details:
    https://rfmw.em.keysight.com/wireless/helpfiles/N1930B/Analyzing/Analyzing_Transmission_Line_Parameters.html

Cable Data Submission Guidelines

- Submit in Touchstone Format (.s4p)
  - https://ibis.org/touchstone_ver2.0/touchstone_ver2_0.pdf
  - Start: 0.1 MHz
  - Stop: 100 MHz
  - Data Points: 1601 (Linear Step Size)

- Measurements should come from 100 meter cables
  - Helps minimize impact from test fixtures

- Consensus model contributors can perform the extractions using submitted data

- Please submit ASAP, but no later than October 31st, 2022

Guidance from Paul Wachtel

Cable Suggestions so far…

- Variety of Category Cables

- Belden 1502R (Plenum) or 1502R (Riser)

- West Penn D25350 (Plenum) or 77350 (Riser)

- Liberty LLINX-U-P (Plenum) or LLINX-U (Riser)

- TMB PC222T143 – s/tp#22 cable w/ separate #14/3 cable in an overall jacket

- TMB PCCCT – s/tp#22+(2)#14 designed for color changers

- TMB PCLV8+2 – u/4tp#24[CAT6] cable w/ (2)#16 power conductors

Guidance from Paul Wachtel

Thanks!