
SPE Multidrop Enhancements Mixing Segment Considerations Update

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Purpose

- **SPE Multidrop Enhancements mixing segment update > diminico_SPMD_01_1119.pdf**
 - **Link segment lengths**
 - **Stub Lengths**
 - **Number of nodes**
 - **MDI SI with PoDL**

SPMD Multidrop Topology

- Use validated 802.3cg Multidrop Model as basis for SPMD-E Multidrop mixing segment characteristics
 - 802.3cg Mixing segment
 - up to at least 8 nodes and 25 m in reach

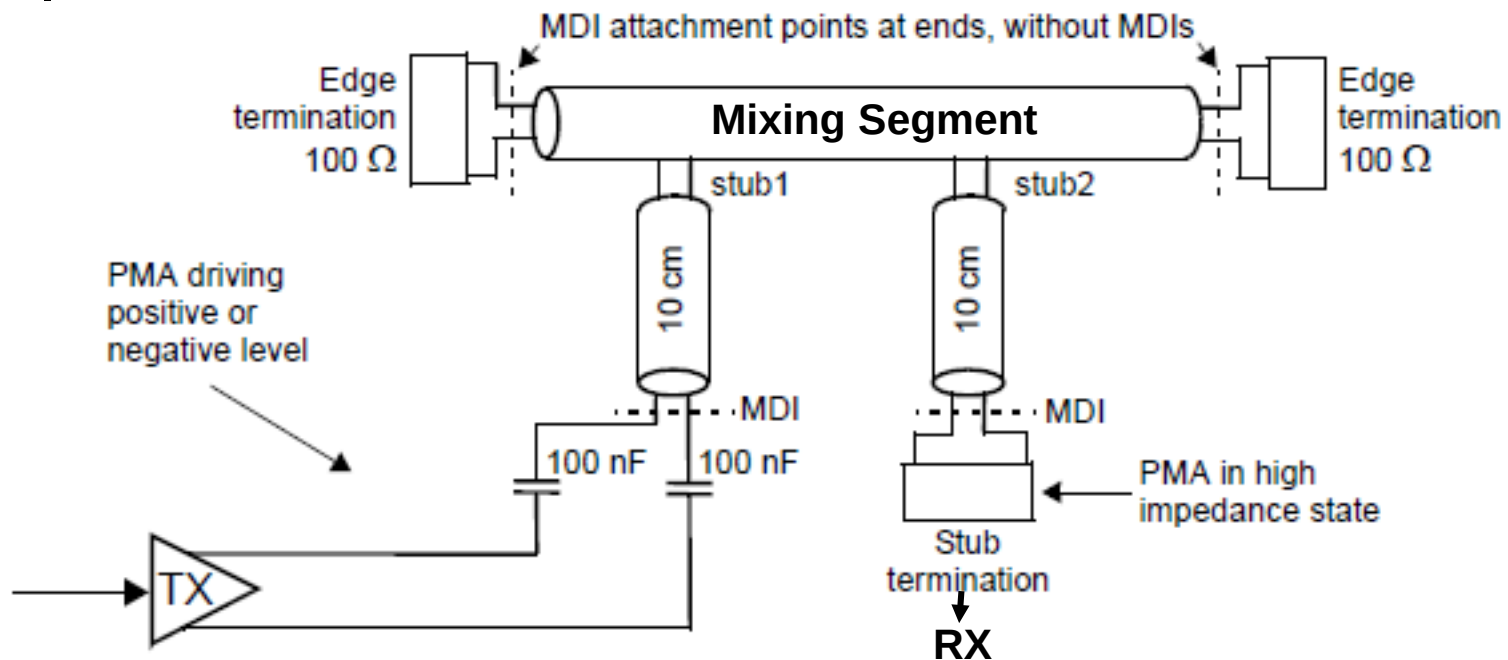


Figure 147-20—Multidrop line termination and PMA

147.9.2 MDI electrical specification – TX - PoDL

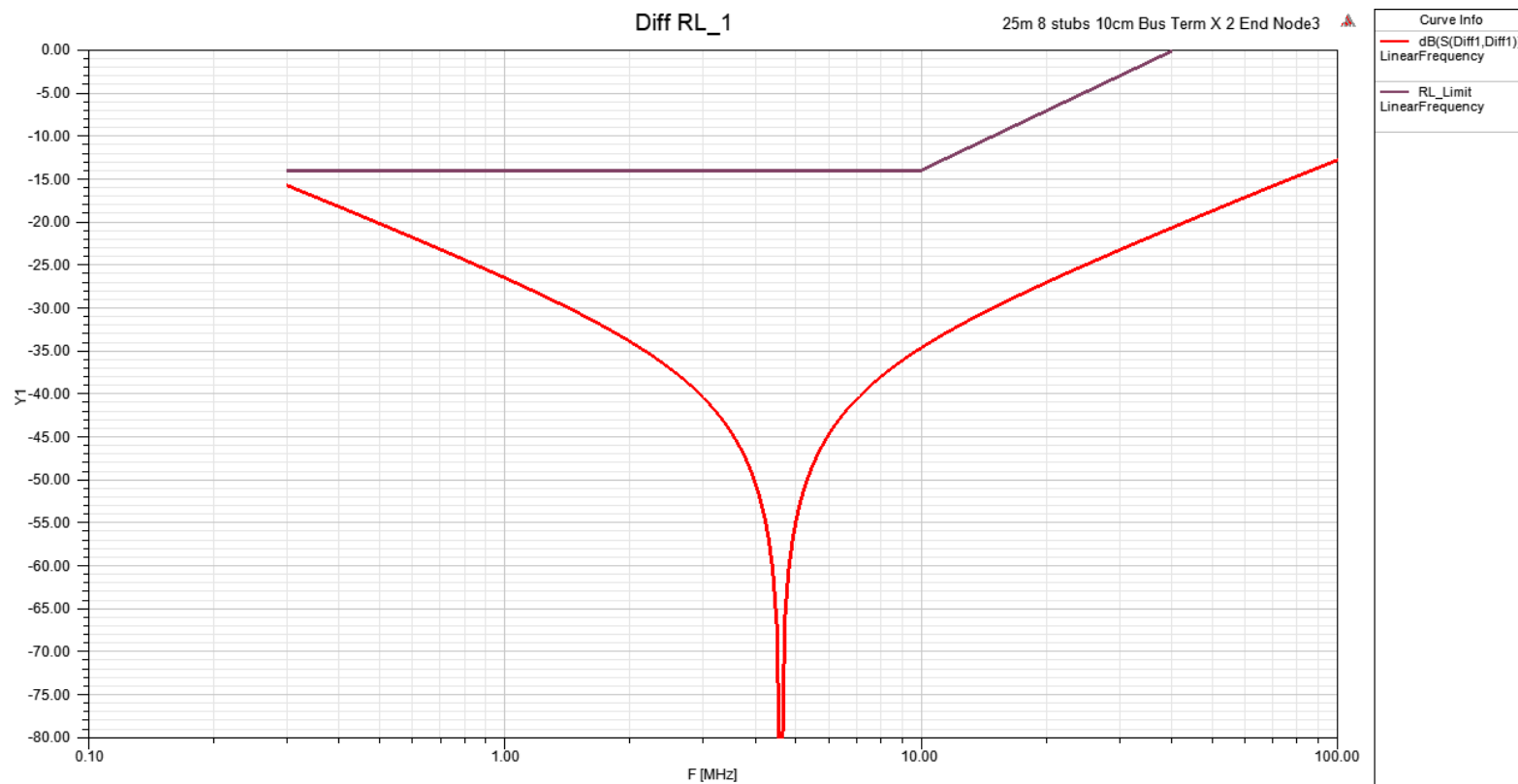
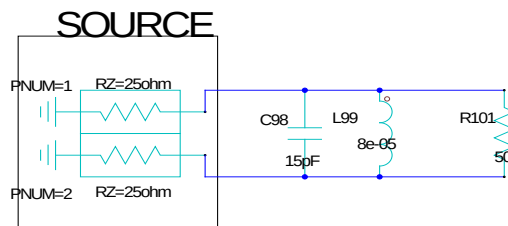


Table 147-4—MDI impedance limit parameters

Parameter name	Unit of measure	Minimum value	Maximum value
R	$k\Omega$	10	—
L	μH	80	—
C_{tot}	pF	—	180
C_{node}	pF	—	15



147.9.2 MDI electrical specification – RX - PoDL

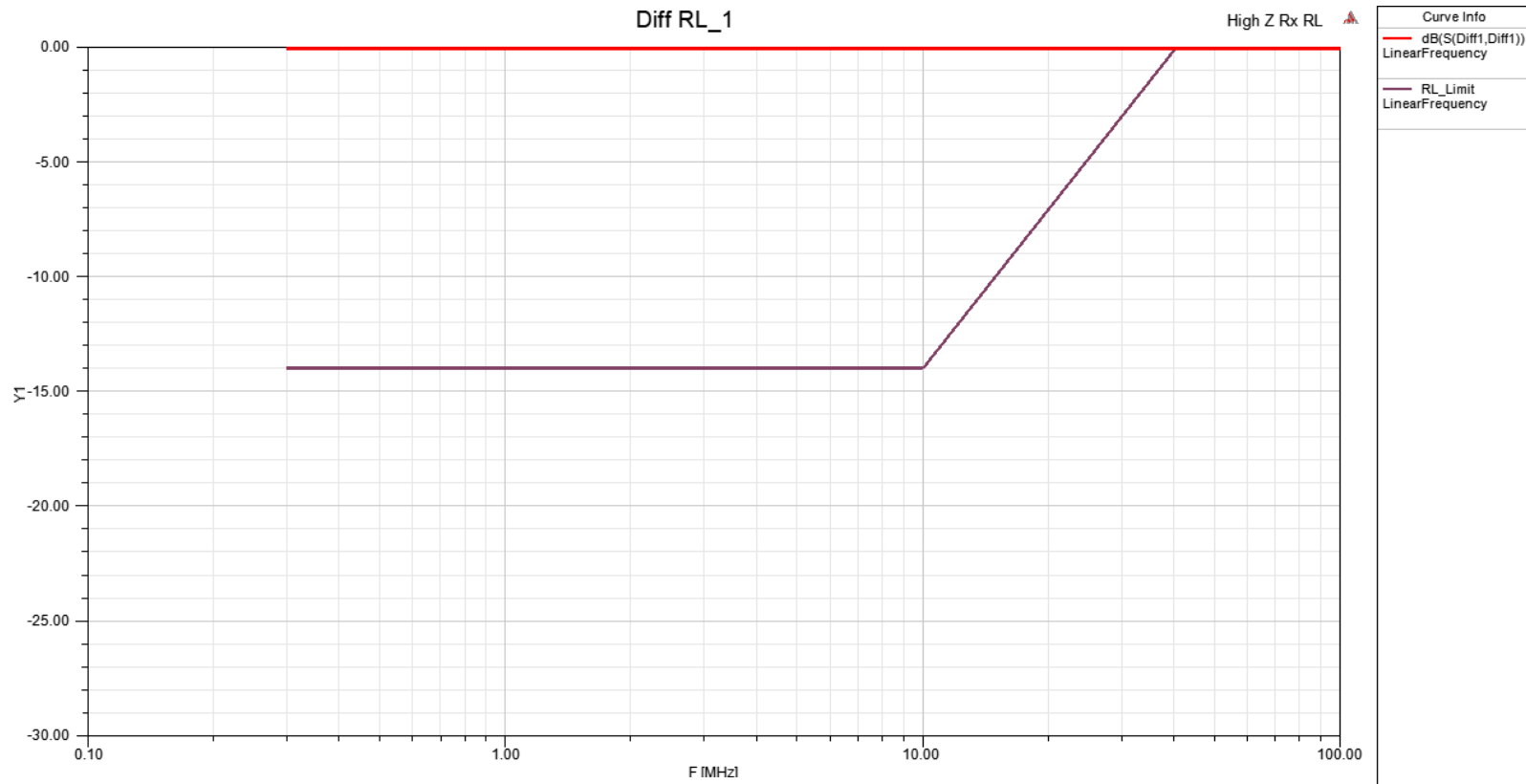
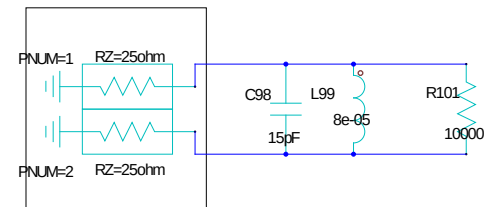


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147.8 Mixing segment characteristics

147.8.1 Insertion loss

The insertion loss of each 10BASE-T1S point-to-point link segment shall meet the values determined using Equation (147-3).

$$\text{Insertion loss}(f) < \left\{ \begin{array}{ll} 1.0 + \frac{1.6(f-1)}{9} & 0.3 \leq f < 10 \\ 2.6 + \frac{2.3(f-10)}{23} & 10 \leq f < 33 \\ 4.9 + \frac{2.3(f-33)}{33} & 33 \leq f \leq 40 \end{array} \right\} \text{ dB} \quad (147-3)$$

where f is the frequency in MHz; $0.3 \leq f \leq 40$

147.8.2 Return loss

$$\text{Return loss}(f) > \left\{ \begin{array}{ll} 14 & 0.3 \leq f < 10 \\ 14 - 10 \log_{10} \left(\frac{f}{10} \right) & 10 \leq f \leq 40 \end{array} \right\} \text{ dB} \quad (147-4)$$

where f is the frequency in MHz; $0.3 \leq f \leq 40$

147.8 Mixing segment characteristics

147.8.3 Mode conversion loss

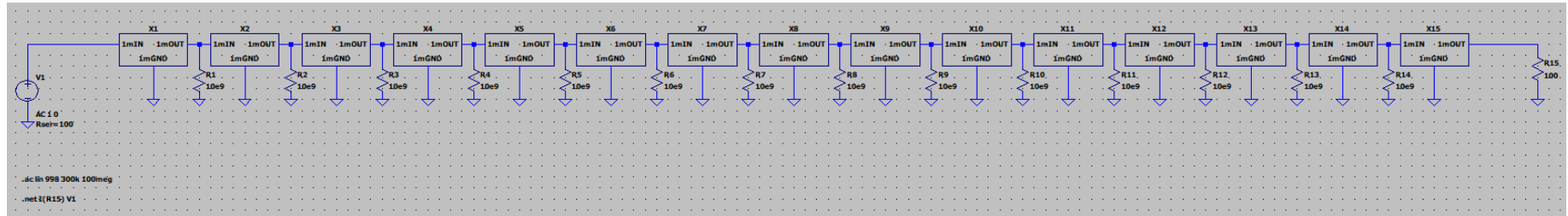
The mode conversion loss of each 10BASE-T1S point-to-point link segment shall meet the values determined using Equation (147-5).

$$\text{Mode conversion loss}(f) > \left\{ \begin{array}{ll} 43 & 0.3 \leq f < 20 \\ 43 - 20 \log_{10}\left(\frac{f}{20}\right) & 20 \leq f \leq 200 \end{array} \right\} \text{ dB} \quad (147-5)$$

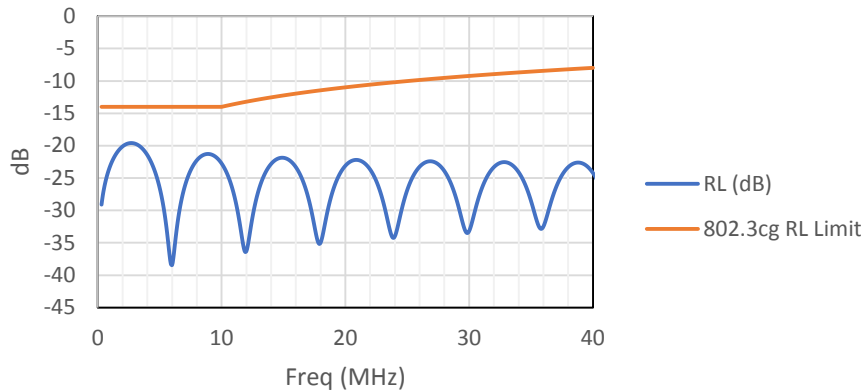
where

f is the frequency in MHz; $0.3 \leq f \leq 200$

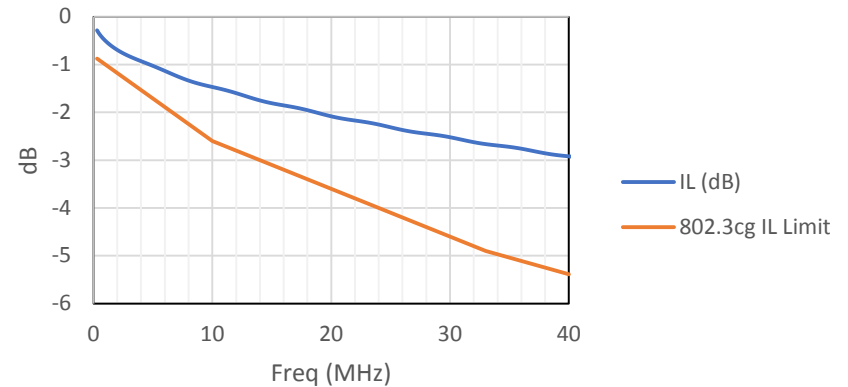
15 meter – Transmission Model



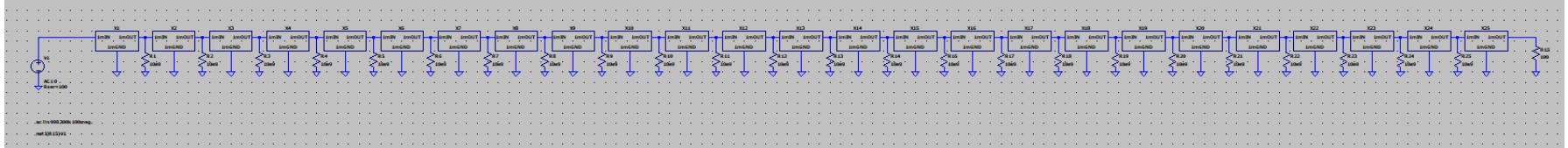
Return Loss



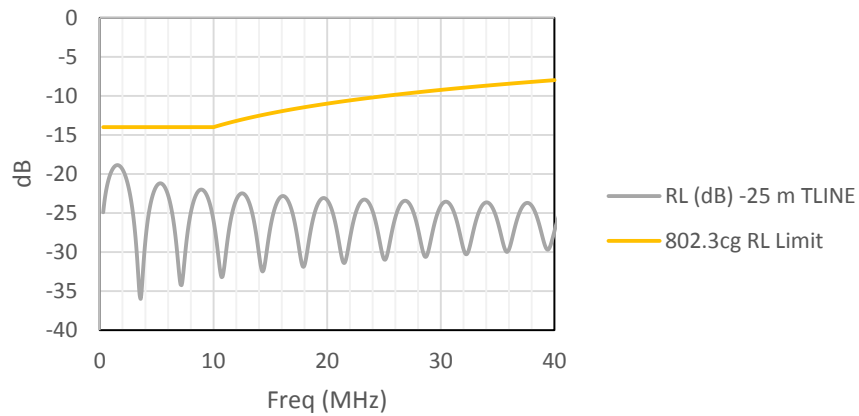
Insertion Loss



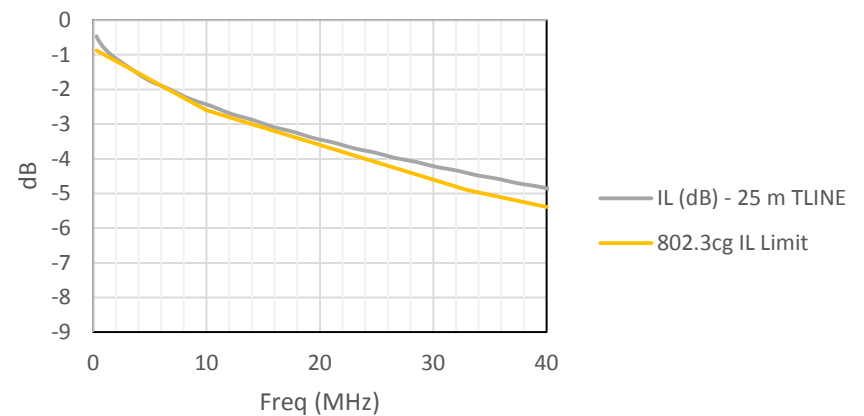
25 meter – Transmission Model



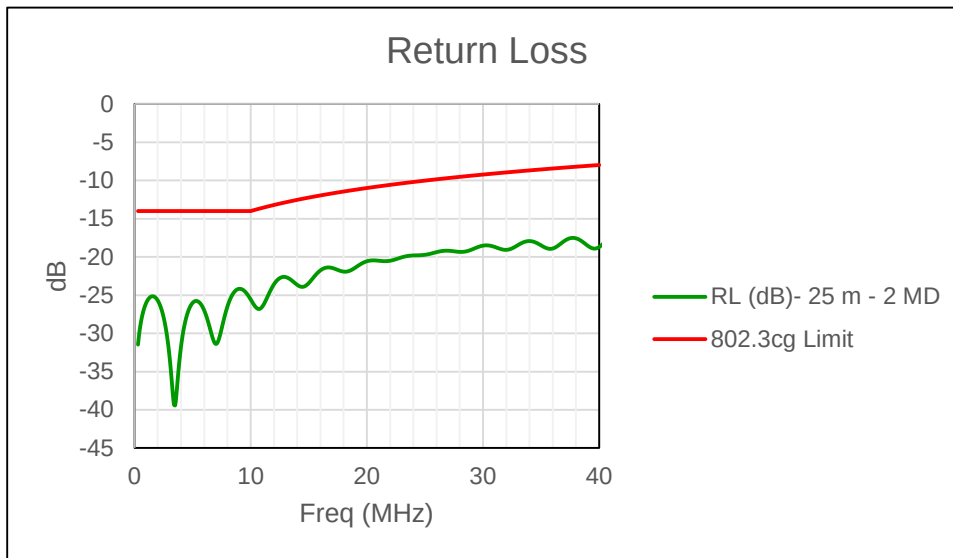
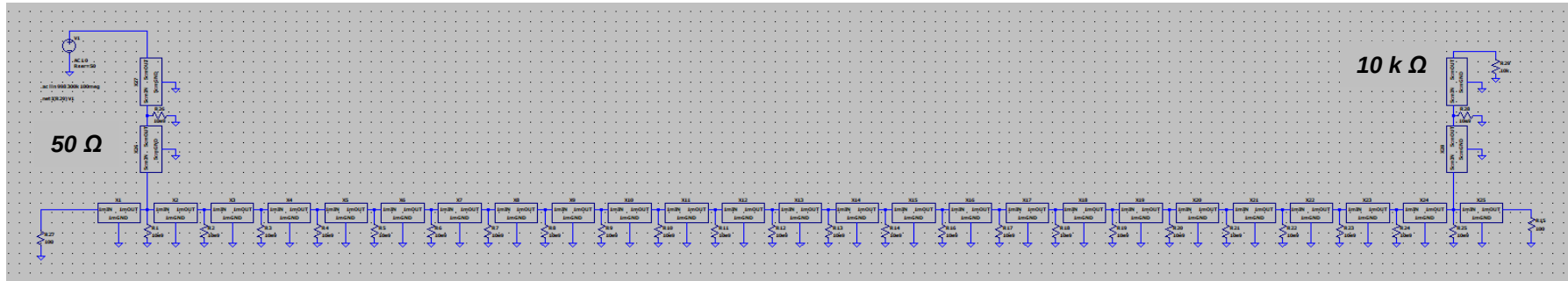
Return Loss



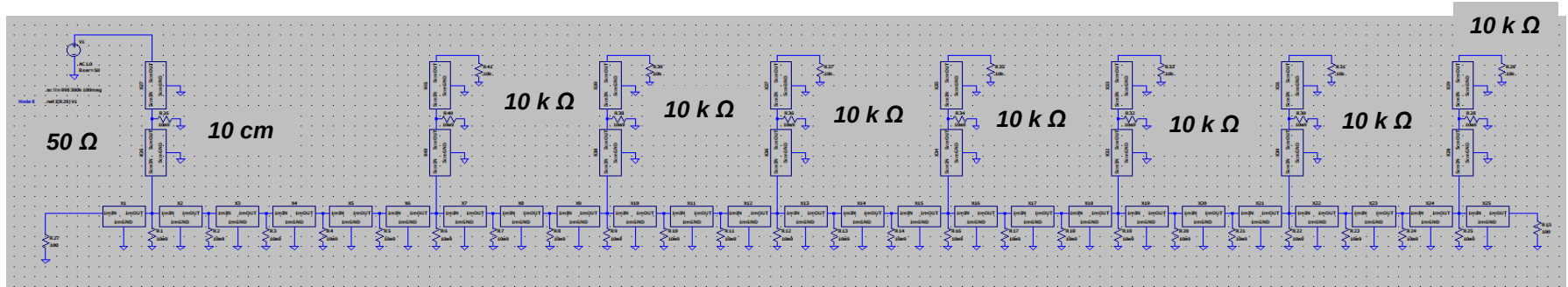
Insertion Loss



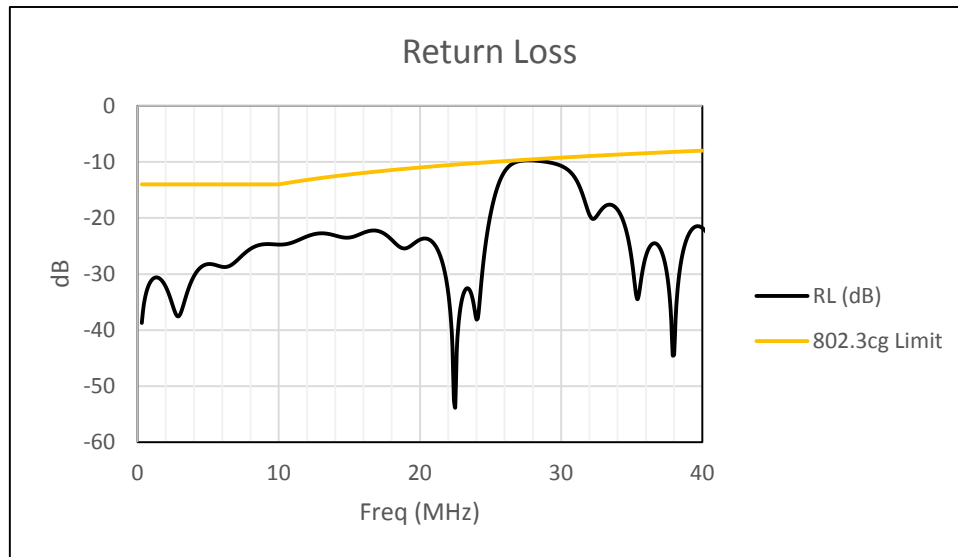
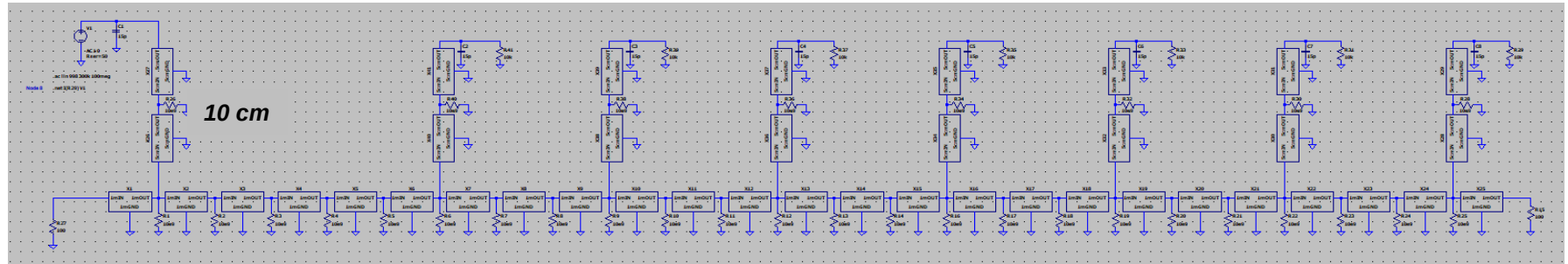
25 m – 2 drops – no cap



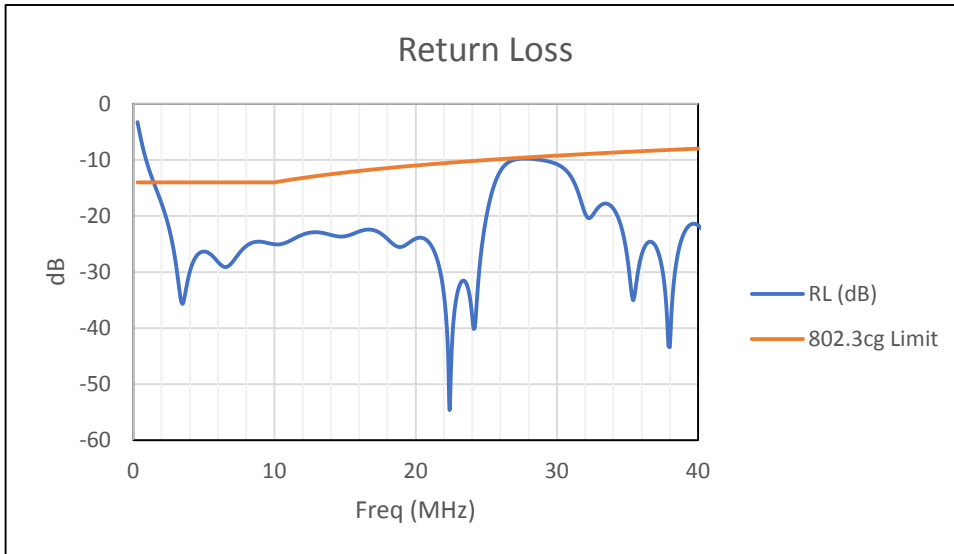
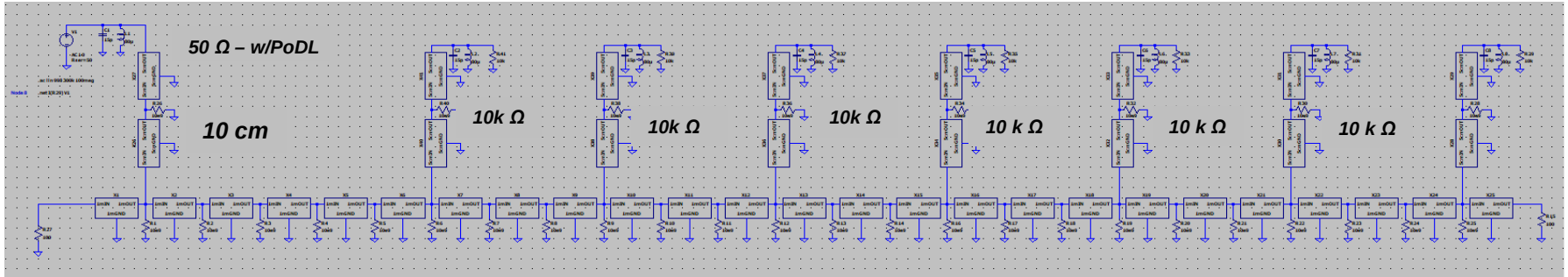
25 m – 8 drops – no cap



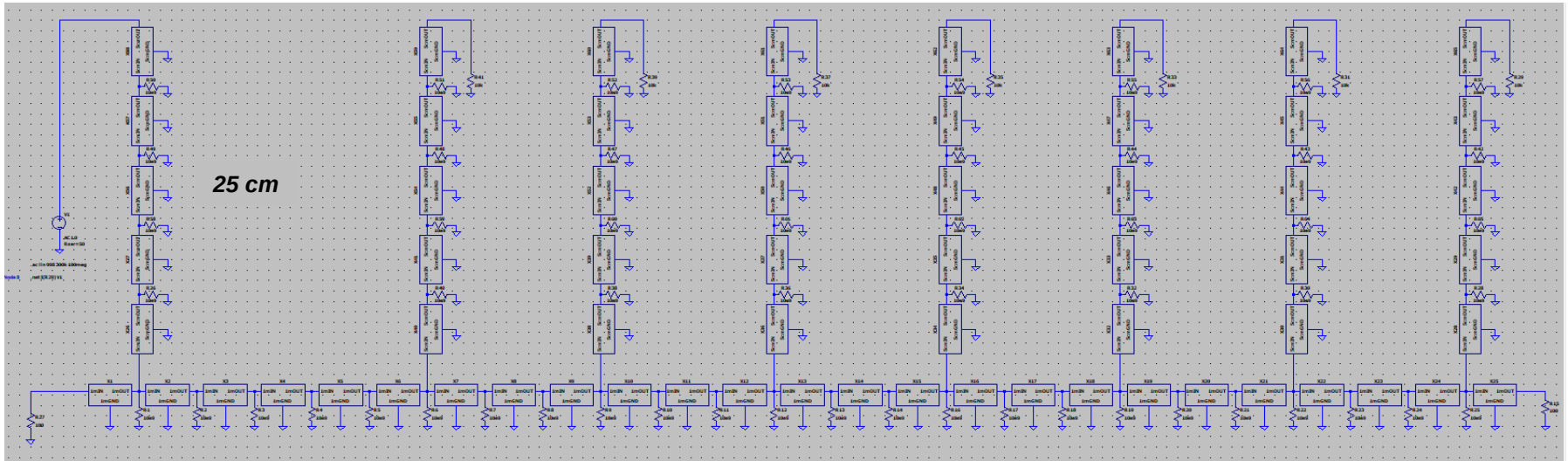
25 m – 802.3cg 8 drops – no PoDL



25 m – 802.3cg 8 drops - PoDL



25 m – 8 drops – 25 cm stub



25 m – 8 drops – 50 cm stub

