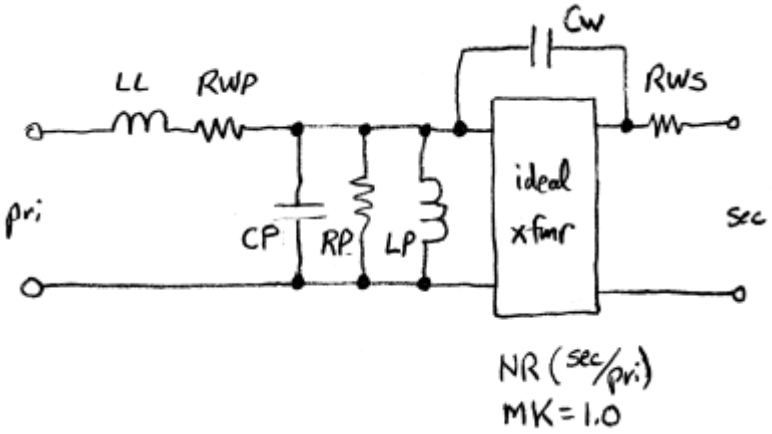
SPICE RF Transformer Modeling

G. Barrere – Exality Corporation



1. Measure RWP and RWS with a DC ohmmeter.

2. Short the secondary and assume that this shorts the primary shunt elements through the ideal transformer. Measure Z_{pri} at low-mid frequency and determine LL from measured X_{pri}.

3. Open the secondary and assume no load on the primary shunt elements. Measure Z_{pri} across the modeling frequency range and plot RP = the real part of Z_{pri}. This will generally be a nonlinear function of frequency due to core loss and skin effect and can be modeled with a behavioral current source, using Laplace or table data. This is done by making the current through the source dependent on the voltage across the source. This dependency will be an expression which causes RP to follow the measured curve.

4. Can measure LP directly at low frequency if X is adequate and the impedance angle is appx +90º. Then CP can be calculated from the self-resonant frequency (SRF) by noting that at the SRF $X_{LP} = X_{CP}$. Otherwise, measure admittance Y_1 < SRF and Y_2 > SRF and solve for LP and CP simultaneously.

5. Short the primary leads together and the secondary leads together, and measure CW between them directly.