SPICE Model – LPZxxxx

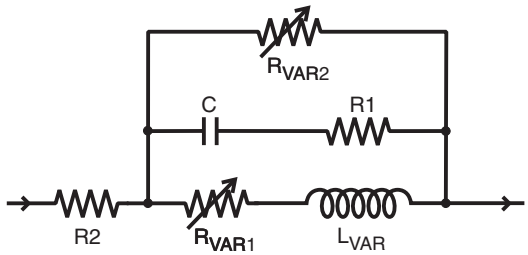
This lumped-element (SPICE) model data simulates the frequency-dependent behavior of Coilcraft power inductors within the frequency range shown in the accompanying table for each individual inductor.

The data represents de-embedded measurements, as described below. Effects due to different customer circuit board traces, board materials, ground planes or interactions with other components are not included and can have a significant effect when comparing the simulation to measurements of the inductors using other production verification instruments and fixtures.

Lumped Element Modeling Method

Measurements were made using a 50 Ohm impedance analyzer. Fixture compensation was performed to remove fixture effects. No DC bias current was applied in any of the measurements. The lumped element values were determined by optimizing the simulation model to an average of the measurements. This method results in a model that represents as closely as possible the typical frequency-dependent behavior of the component within the model frequency range.

The equivalent lumped element model schematic is shown below. Each model should only be analyzed at the input and output ports. Individual elements of the model are not determined by parameter measurement. The elements are determined by the overall performance of the lumped element model compared to the measurements taken of the component.



The value of the frequency-dependent variable resistor R_{VAR1} is calculated from:

$$R_{VAR1} = k1 \times \sqrt{f}$$

- k1 is shown for each value in the accompanying table.
- f is the frequency in Hz
- R_{VAR1} is the resistance in Ohms

The value of the frequency-dependent variable resistor R_{VAR2} is calculated from:

$$R_{VAR2} = k2 \times \sqrt{f}$$

- k2 is shown for each value in the accompanying table.
- f is the frequency in Hz
- R_{VAR2} is the resistance in Ohms

Note: The log function in the following equation is the natural logarithm, base *e*, not base 10.

The value of the frequency-dependent inductance L_{VAR} is calculated from:

$$L_{VAR} = k3 - k4 \times LOG\ (k5 \times f)$$

- k3, k4, and k5 are shown in the accompanying table.
- f is the frequency in Hz
- L_{VAR} is the inductance in µH
- LOG is the natural LOG (base *e*)

Disclaimer

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SPICE Model for LPZ Power Inductors

	Frequency limit of model (MHz)							L_{VAR} Coefficients		
Part number	**Lower**	**Upper**	**R1 (Ω)**	**R2 (Ω)**	**C (pF)**	**k1**	**k2**	**k3**	**k4**	**k5**
LPZ3008-224	0.1	10	1370	11.5	1.156	1.30E-03	58.0	220	1.45	1.00E-05
LPZ3008-334	0.1	10	820	18.0	1.484	9.00E-04	108	330	1.55	1.03E-05
LPZ3010-334	0.1	10	2500	18.5	1.250	1.10E-03	66.0	330	1.07	1.01E-05
LPZ3015-334	0.1	8	160	22.0	4.12	4.40E-03	75.0	330	3.83	1.03E-05
LPZ3314-105	0.1	5	185	31.0	2.54	1.00E-05	310	1000	9.21	1.11E-05
LPZ3314-155	0.1	5	185	44.0	2.30	1.00E-05	380	1500	14.87	1.14E-05
LPZ4012-335	0.1	1	2100	76.0	6.93	1.00E-06	310	3300	44.0	1.89E-05
LPZ4018-155	0.1	6	200	25.0	3.54	2.00E-03	330	1500	20.2	1.16E-05
LPZ4018-185	0.1	4	210	31.5	3.65	2.10E-02	525	1800	21.4	1.20E-05
LPZ4018-225	0.1	3	400	32.5	3.49	2.20E-02	700	2200	21.4	1.35E-05
LPZ4018-335	0.1	2	430	48.0	3.53	5.80E-03	950	3300	22.5	1.94E-05
LPZ4414-155	0.1	10	73	26.4	2.40	1.95E-02	421	1500	5.66E-02	6.45E-03
LPZ4414-185	0.1	10	77	35.0	2.55	4.69E-05	1348	1800	8.08E-02	2.00E-01
LPZ4414-225	0.1	10	57	42.5	2.22	4.69E-05	473	2200	1.00E-06	1.41E-01
LPZ4414-335	0.1	10	55	56.0	2.43	4.69E-05	646	3300	1.00E-06	1.41E-01
LPZ5010-105	0.1	4	460	28.0	2.51	7.00E-04	440	1000	3.0	1.38E-05
LPZ5015-335	0.1	10	30	55.0	2.40	6.00E-08	1275	3300	0.98	3.31E-01
LPZ5015-475	0.1	9	36	80.0	3.05	6.00E-08	1400	4700	4.0	7.07E-03

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