SPICE Model – xx512PJB

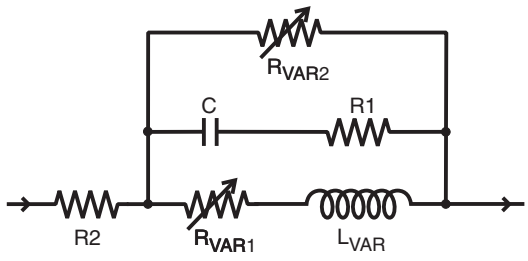
This lumped-element (SPICE) model data simulates the frequency-dependent behavior of Coilcraft power inductors within the frequency range shown in the accompanying table for each individual inductor.

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:

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

- 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:

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

- 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:

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

- 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 (basee)

Disclaimer

Coilcraft makes every attempt to provide accurate measurement data and software, representative of our components, in a usable format. Coilcraft, however, disclaims all warrants relating to the use of its data and software, whether expressed or implied, including without limitation any implied warranties of merchantability or fitness for a particular purpose. Coilcraft cannot and will not be liable for any special, incidental, consequential, indirect or similar damages occurring with the use of the data and/or software.

Coilcraft CPS
CRITICAL PRODUCTS & SERVICES

1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363

Fax 847-639-1508
Email cps@coilcraft.com
www.coilcraft-cps.com

Document 267C-1 Revised 02/18/13

SPICE Model for Coilcraft xx512PJB 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
xx512PJB682	0.1	60	200	0.075	1.93	9.00E-05	2.2	6.8	0.06	9.85E-06
xx512PJB822	0.1	50	178	0.095	2.53	1.80E-04	2.56	8.2	0.10	9.85E-06
xx512PJB103	0.1	40	115	0.100	2.85	1.00E-04	3.22	10	0.11	9.88E-06
xx512PJB123	0.1	40	75	0.110	3.24	1.80E-04	3.74	12	0.17	9.92E-06
xx512PJB153	0.1	30	50	0.125	3.79	3.00E-04	4.95	15	0.19	9.92E-06
xx512PJB183	0.1	30	65	0.140	3.06	2.20E-04	5.76	18	0.22	9.92E-06
xx512PJB223	0.1	30	45	0.145	3.32	2.60E-04	6.68	22	0.24	9.92E-06
xx512PJB333	0.1	30	14	0.180	3.61	2.80E-04	7.74	33	0.36	9.92E-06
xx512PJB473	0.1	30	13	0.245	4.00	1.40E-03	10.2	47	0.68	9.80E-06
xx512PJB563	0.1	30	12	0.280	3.92	1.00E-03	12.4	56	0.88	9.90E-06
xx512PJB683	0.1	30	14	0.345	3.91	4.00E-04	16.2	68	0.92	9.99E-06
xx512PJB823	0.1	20	20	0.315	3.13	4.00E-04	17.0	82	0.90	9.97E-06
xx512PJB104	0.1	20	20	0.375	2.86	7.50E-04	20.2	100	0.92	9.94E-06
xx512PJB124	0.1	20	22	0.435	3.21	9.00E-04	26.6	120	0.94	1.00E-05
xx512PJB154	0.1	10	18	0.535	3.85	1.90E-03	30.0	150	1.2	1.00E-05
xx512PJB224	0.1	10	24	0.72	3.64	1.20E-03	41.0	220	1.8	1.02E-05
xx512PJB334	0.1	6.0	100	1.02	4.19	6.00E-04	67.0	330	2.5	1.06E-05
xx512PJB474	0.1	5.0	130	1.58	5.05	4.00E-04	96.0	470	2.8	1.15E-05
xx512PJB564	0.1	4.0	70	1.75	5.18	1.60E-03	102	560	3.2	1.19E-05
xx512PJB684	0.1	3.0	190	1.97	4.67	2.00E-03	131	680	3.4	1.25E-05
xx512PJB824	0.1	3.0	160	2.70	6.00	2.60E-03	178	820	4.7	1.37E-05
xx512PJB105	0.1	3.0	120	3.20	5.20	3.80E-03	215	1000	5.5	1.42E-05
xx512PJB155	0.1	3.0	180	4.60	4.72	4.20E-03	303	1500	7.7	1.68E-05
xx512PJB185	0.1	3.0	120	5.42	5.41	6.90E-03	380	1800	8.0	2.30E-05
xx512PJB225	0.1	3.0	70	6.40	5.52	9.50E-03	435	2200	8.8	3.18E-05
xx512PJB335	0.1	2.0	180	8.90	6.67	1.10E-02	640	3300	19.3	4.26E-05
xx512PJB475	0.1	2.0	30	14.0	5.76	1.10E-02	1200	4700	18.0	1.55E-04
xx512PJB565	0.1	1.0	250	16.4	6.82	1.10E-02	1100	5600	22.0	4.25E-04
xx512PJB685	0.1	1.0	50	21.4	5.72	1.20E-02	1500	6800	30.0	3.02E-04
xx512PJB825	0.1	1.0	60	24.0	6.62	1.50E-02	1600	8200	35.0	1.32E-03
xx512PJB106	0.1	1.0	60	29.0	8.05	1.40E-02	1700	10000	50.0	4.59E-03

Coilcraft CPS
CRITICAL PRODUCTS & SERVICES

1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363

Fax 847-639-1508
Email cps@coilcraft.com
www.coilcraft-cps.com

Document 267C-70 Revised 02/18/13