

## Coilcraft S-Parameter Data for Surface Mount Power Inductors MSS1210 Series

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Coilcraft two-port S-parameter data files are based on empirical measurements of Coilcraft Surface Mount Power Inductors and represent measured behavior as described below. S-parameter data files are used as "black box" descriptions to reduce complexity in circuit modeling.

These 2-port s-parameters simulate the frequency-dependent behavior of Coilcraft MSS1210 surface mount power inductors within the frequency limits shown in the accompanying table (Table 1) for each individual inductor. They are based on measurements using a **1-port impedance analyzer** (HP4991 with 16193A test fixture).

Effects due to different circuit board traces, board materials, ground planes or interactions with other components are not included. They may have a significant effect when comparing the simulation to measurements of the individual inductors using other production verification instruments and fixtures.

### **S-parameter modeling method**

The s-parameters were generated by matching a simulation model as closely as possible to a **1-port measurement** of a typical inductor using an impedance analyzer. The model was then used to create the final 2-port s-parameters. This method results in a model that represents as closely as possible the typical frequency-dependent behavior of the component within the specified frequency limits (see Table 1).

Because our simulation models were used to generate our 2-port S-parameters, they give identical results with the same number of simulation frequency points. The simulation models are available on our web site at <http://www.coilcraft.com/models.cfm>.

The valid frequency range for each part is specified in Table 1 below.

**Table 1**  
**Valid Frequency Range of S-parameters**

<b>Part number</b>	<b>Frequency range (MHz)</b>	<b>Part number</b>	<b>Frequency range (MHz)</b>	<b>Part number</b>	<b>Frequency range (MHz)</b>
MSS1210-103	0.1 – 40	MSS1210-184	0.1 – 10	MSS1210-225	0.1 – 5
MSS1210-153	0.1 – 30	MSS1210-224	0.1 – 8	MSS1210-275	0.1 – 3
MSS1210-223	0.1 – 30	MSS1210-334	0.1 – 8	MSS1210-335	0.1 – 3
MSS1210-333	0.1 – 20	MSS1210-474	0.1 – 8	MSS1210-395	0.1 – 2
MSS1210-473	0.1 – 20	MSS1210-684	0.1 – 8	MSS1210-475	0.1 – 1
MSS1210-683	0.1 – 10	MSS1210-105	0.1 – 8	MSS1210-565	0.1 – 1
MSS1210-104	0.1 – 10	MSS1210-125	0.1 – 5	MSS1210-685	0.1 – 1
MSS1210-124	0.1 – 10	MSS1210-155	0.1 – 5	MSS1210-825	0.1 – 1
MSS1210-154	0.1 – 10	MSS1210-185	0.1 – 5	MSS1210-106	0.1 – 1

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### S-parameter file description.

The S-parameter data files are in the TouchStone format. The following is a typical data segment of a two-port file:

```
# MHZ S MA R 50
!Freq  MagS11  AngS11  MagS21  AngS21  MagS12  AngS12  MagS22  AngS22
100    0.001   59.879   1.000   -0.036   1.000   -0.036   0.001   59.879
110    0.014   83.698   0.999   -0.798   0.999   -0.798   0.014   83.698
120    0.027   84.582   0.998   -1.558   0.998   -1.558   0.027   84.582
....
```

The first line (header) describes the frequency units, parameter, measurement format and characteristic impedance of the measurement (50 Ohms).

The first column is the frequency in MHz. The next columns are the S-parameters as described in the column headings.

### Disclaimer

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