Coilcraft S-Parameter Data for
UWB Ultra-Wideband Transformers

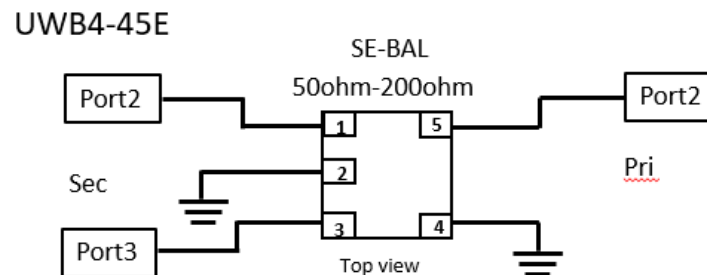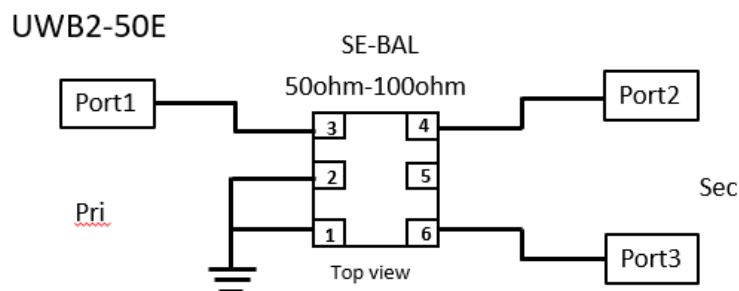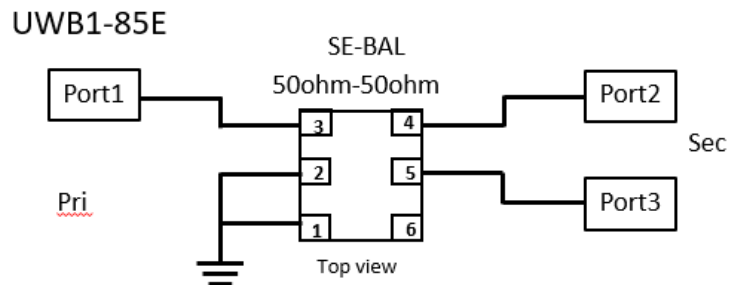*Version UWB Series Sept, 2021 Coilcraft, Inc. 2021*

Coilcraft multiple-port S-parameter data files are based on empirical measurements of Coilcraft UWB wideband transformers. The data files are used as "black box" descriptions, thus reducing complexity in circuit modeling.

The data files represent de-embedded measurements. Effects due to 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 S-parameters to measurements of the transformers using typical production verification instruments and fixtures.

S-parameter modeling method

The measurements for this part were made using a multiple-trace circuit board on FR-4. The valid frequency range for all parts is 0.10 – 8500 MHz. The board parasitics were removed through the usage of auto port extensions to adjust the reference plane to the ends of the traces. By doing this, only the component itself is represented in these S-Parameters.

For port references please refer to the below schematics. Performance will change by connecting ports to different impedances and attaching ports to ground.

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How to use the files

The data file names have the format `P/N.SXP`:

    `P/N` = is the part number

     `X` = the number of ports in the device

S-parameter file description.

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

```
# MHZ S MA R 50
Stim Mag(S11)  Angle(S11)  Mag(S12)  Angle(S12)  Mag(S13)  Angle(S13)  Mag(S14)  Angle(S14)
     Mag(S21)  Angle(S21)  Mag(S22)  Angle(S22)  Mag(S23)  Angle(S23)  Mag(S24)  Angle(S24)
     Mag(S31)  Angle(S31)  Mag(S32)  Angle(S32)  Mag(S33)  Angle(S33)  Mag(S34)  Angle(S34)
     Mag(S41)  Angle(S41)  Mag(S42)  Angle(S42)  Mag(S43)  Angle(S43)  Mag(S44)  Angle(S44)
     ....
```

The first line (header) describes the frequency units, parameter, measurement format and characteristic impedance of the measurement (50 Ohms). Each record contains 1 stimulus value and 16 S-parameters (total of 33 values).

Disclaimer

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