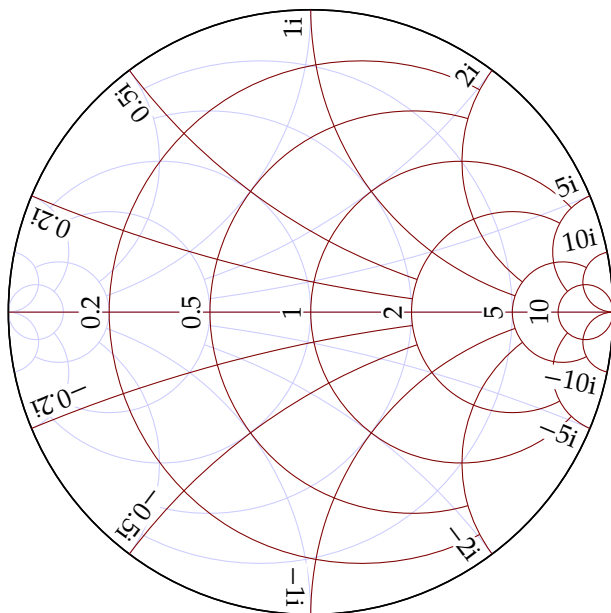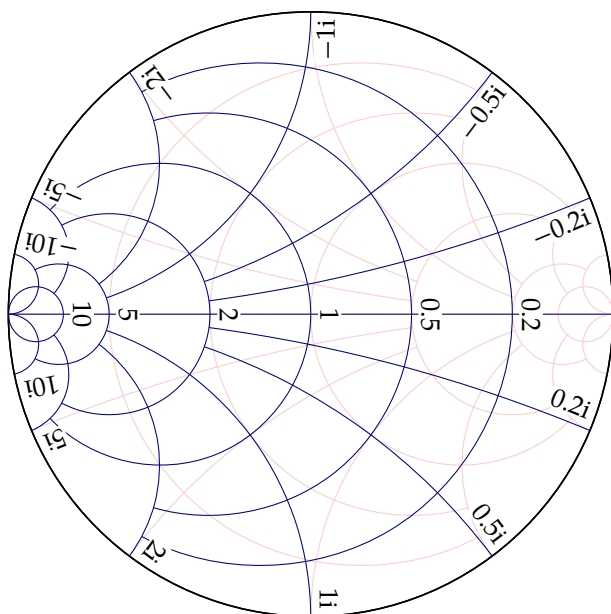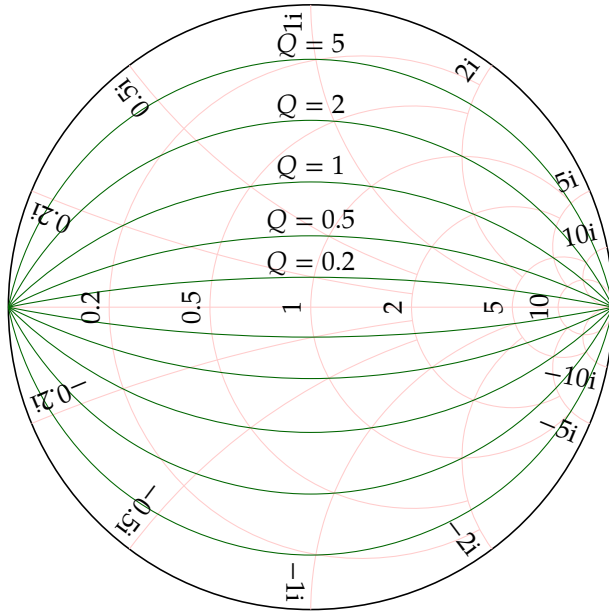## Impedance Chart

Addmittance Chart
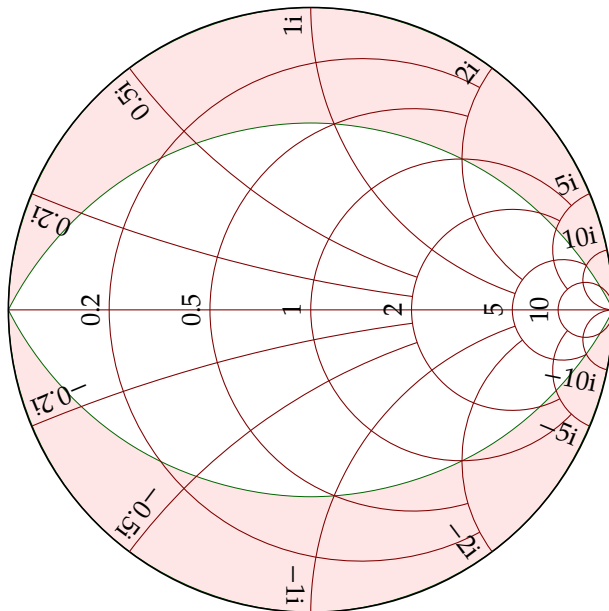
Arcs of constant Q

Though there other means to determine the parameters of an arc (center and angles) we use an algorithm Professor David Wright of Oklahoma State University implemented in Matlab. It's based on complex numbers and expects three coordinate pairs which may not be collinear.

Forbidden Region if $Q < 2$ is required

Impdances which cannot be matched by various L-Networks

L

L

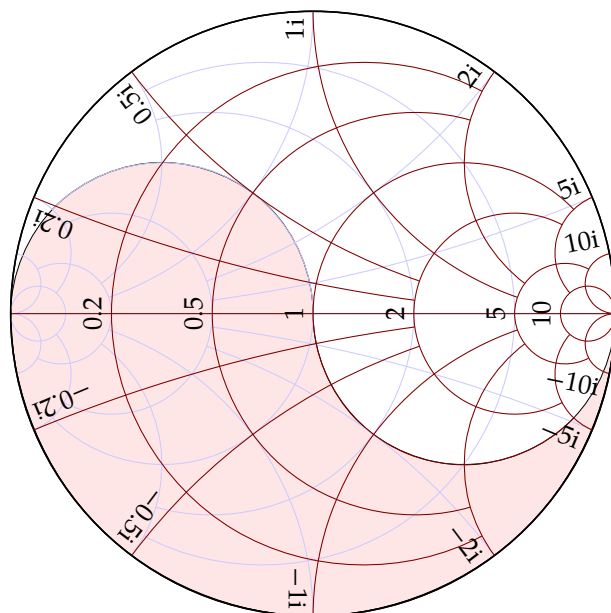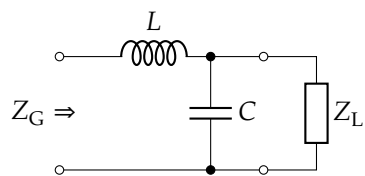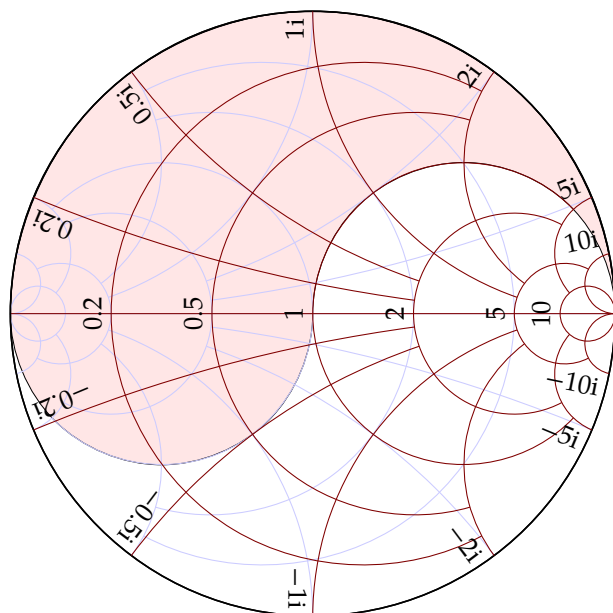$Z_\mathrm{G} \Rightarrow$ L Z_L

L

$Z_\mathrm{G} \Rightarrow$ L Z_L

C

$Z_\mathrm{G} \Rightarrow$ C Z_L

C

$Z_\mathrm{G} \Rightarrow$ C Z_L
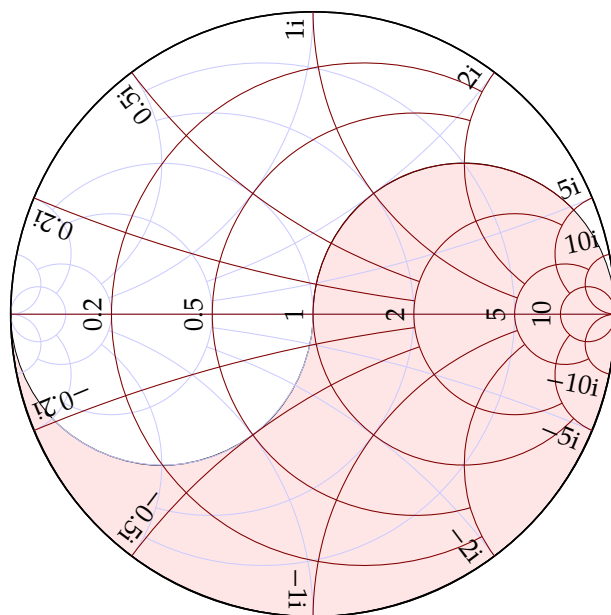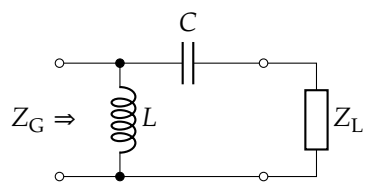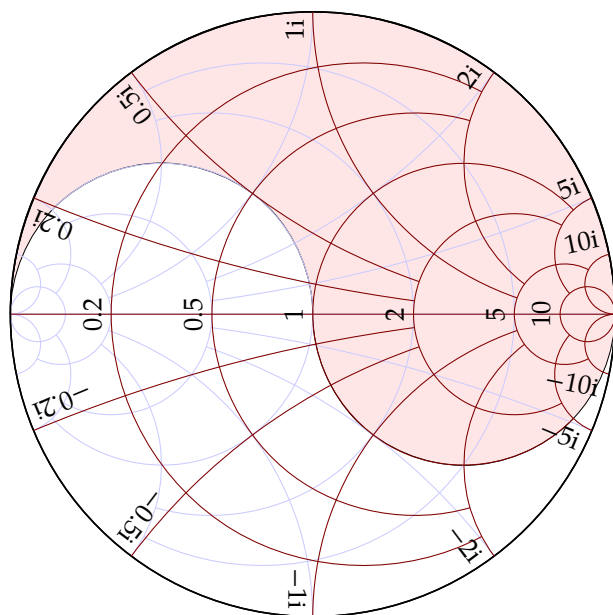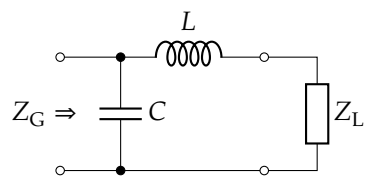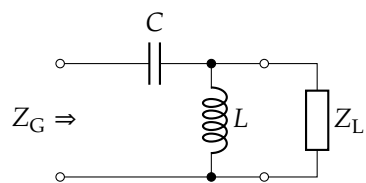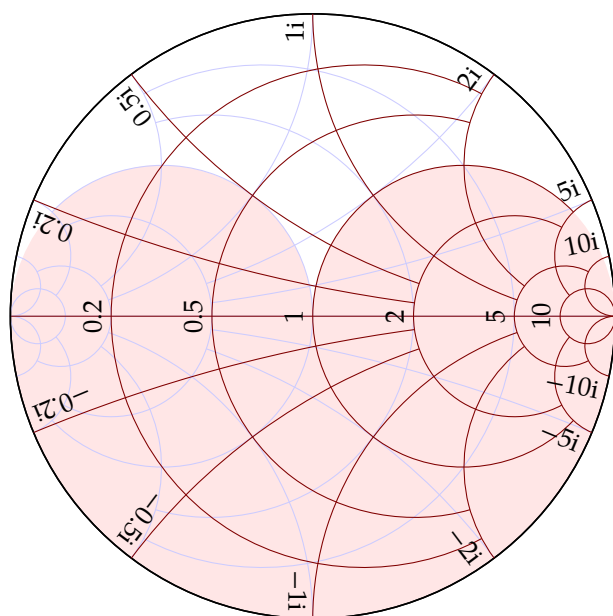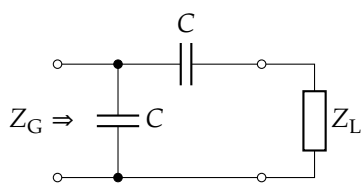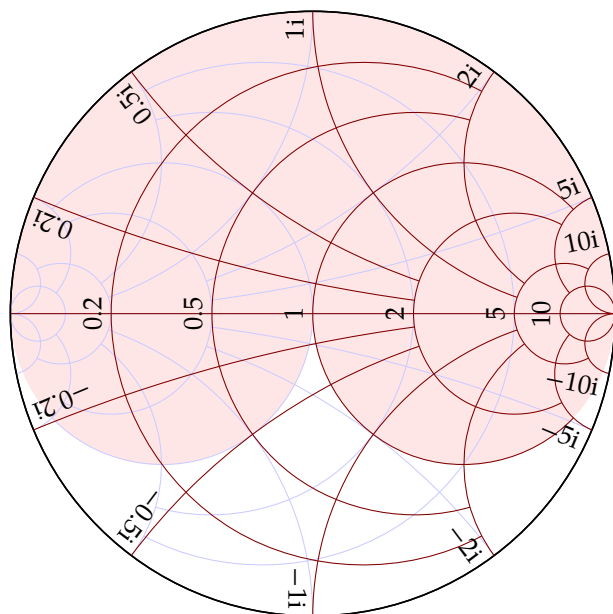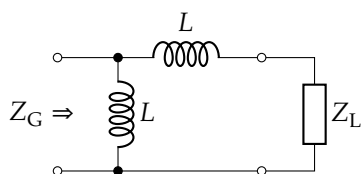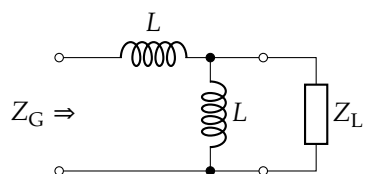
Reflection Coefficient and Return Loss Circles

The argument can be either a number or a list of real numbers. Numbers < 1 denote reflection coefficients $|\Gamma|$, numbers ≥ 1 denote return loss $|\varrho|$ in dB.

$|\Gamma|$ circles ($|\Gamma| = 0.2, 0.4, 0.6, 0.8$).
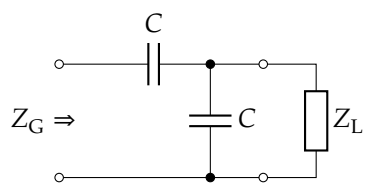

Return loss circles ($\varrho = 10, 20, 30$) dB.

Mark Circles of constant |Γ| or Return Loss with Background Colors

Plotting Data

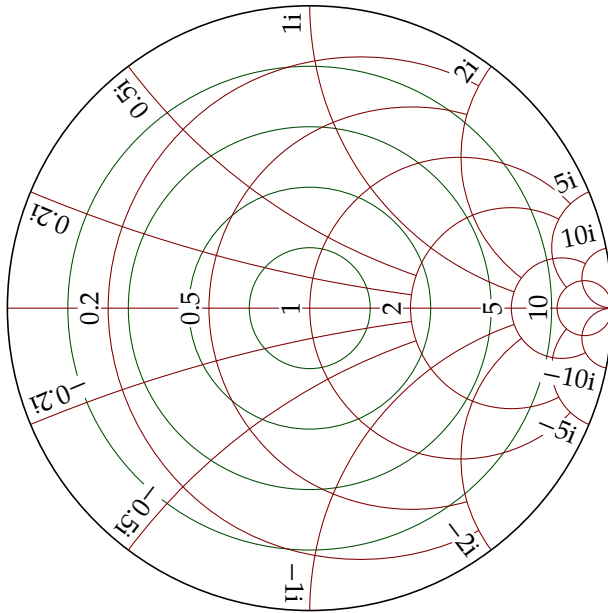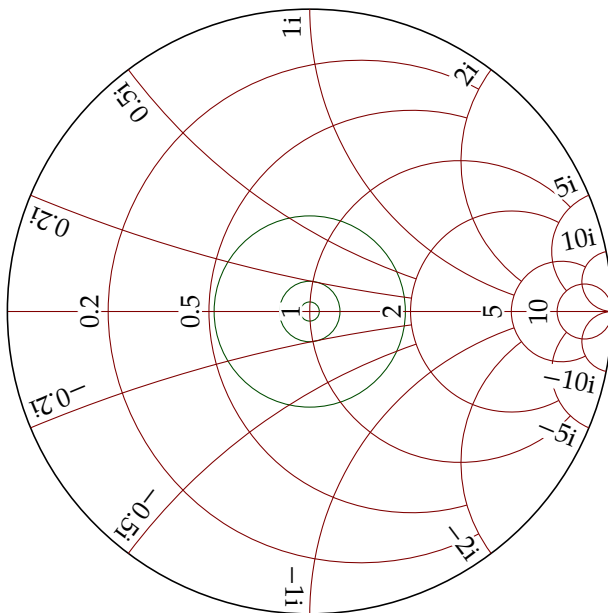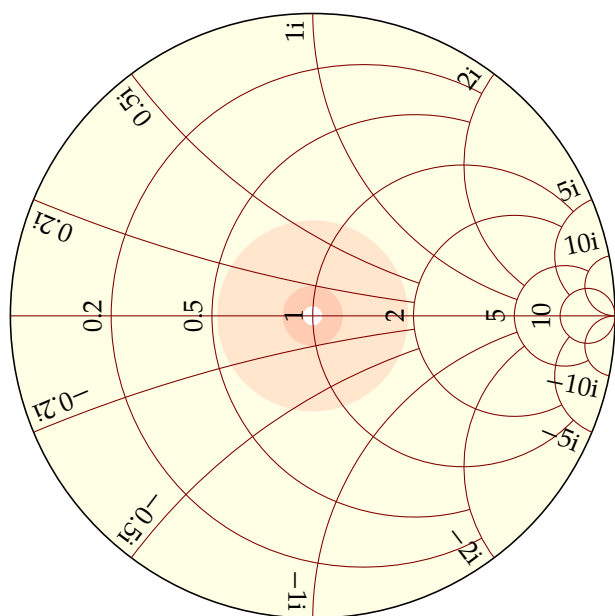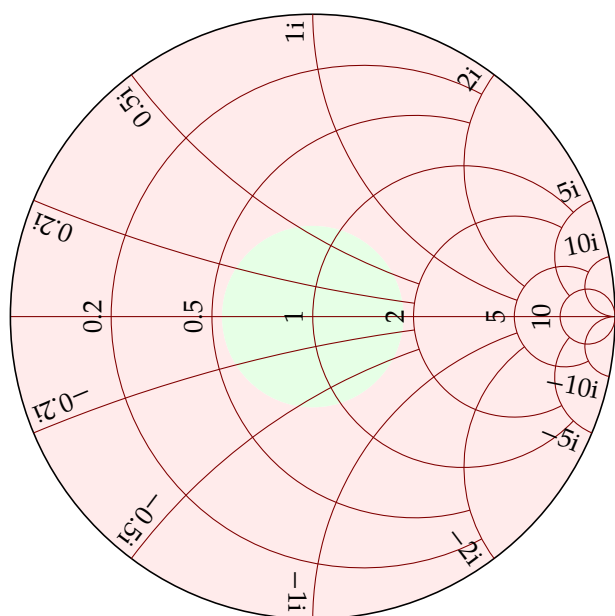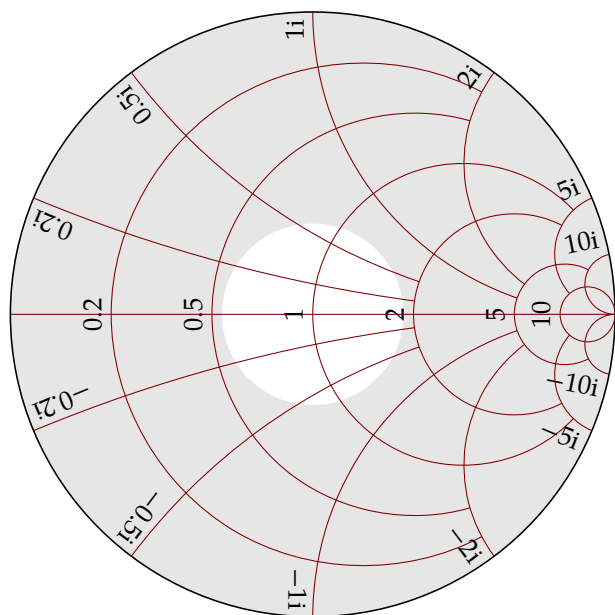When reading the data file, all lines which do not begin with a number are ignored, column separators like comma, semicolon, or ⟨TAB⟩ are replaced by a ⟨SPACE⟩ character. Multiple ⟨SPACE⟩ characters are collapsed into one. Finally the ⟨SPACE⟩ character is used as a column separator.

Within a [La]TeX input file a lambda expression can be passed to Lua which is evaluated for each line of the data file.

If no such lambda expression is given,
   `function (a) return a[1], a[2] end`
is assumed. `a` is a list of columns, `a[n]` is the nth column.

By default the first and second column is selected from each line of the data file. However, the expression can contain any valid Lua code which makes this concept extremely powerful.

There has been no need so far to pre-process any data file, regardless which program created it. Tested with data from a Rohde und Schwarz network analyzer, GNU Octave ASCII data files, and LTSpice. Even CSV should work if the data file is compliant with the non-existent file format specification.
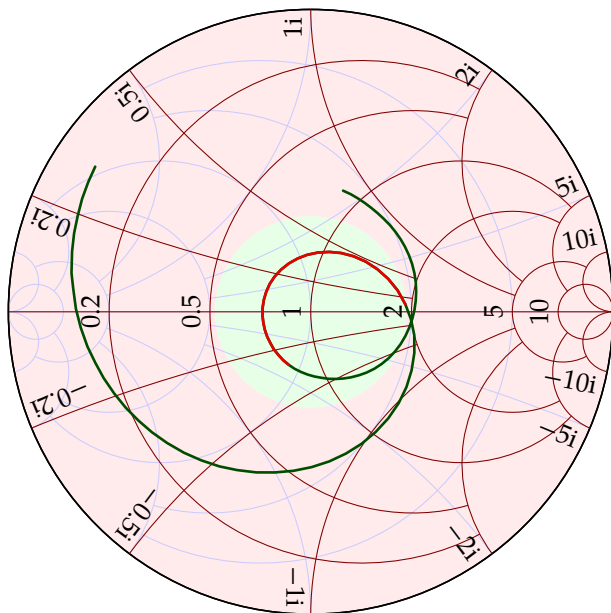
Example 1: Impedance of an Antenna

Plotting s_{11} of an antenna. Frequency range 865 MHz ... 965 MHz (green), 902 MHz ... 928 MHz (red):
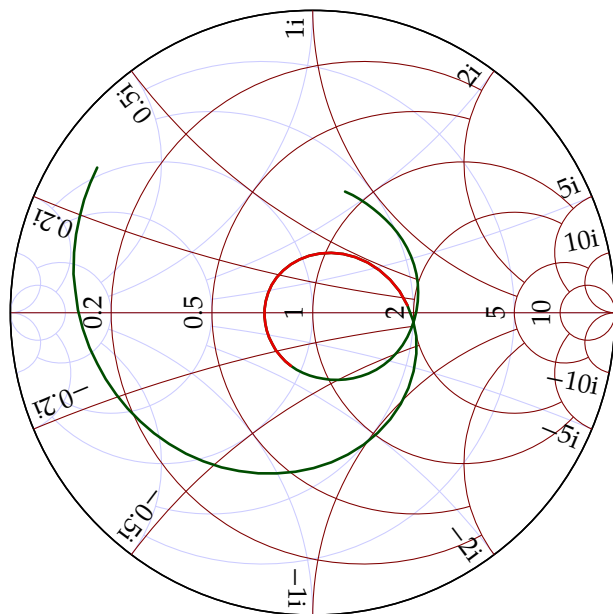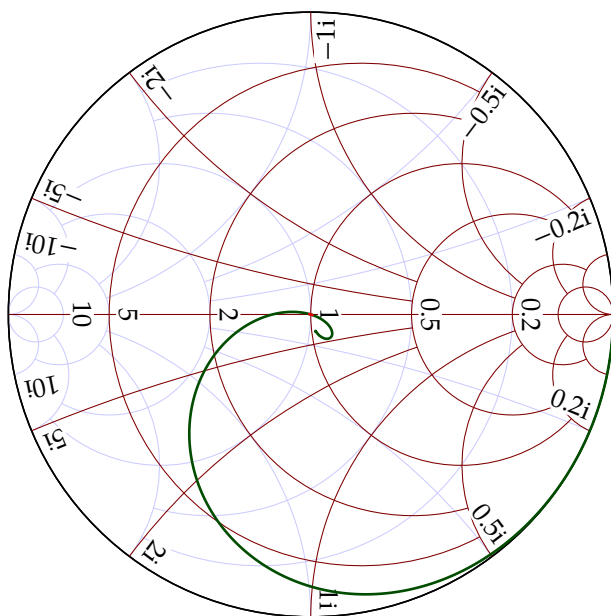

Data from Rohde und Schwarz ZVL *network analyzer.*

The return loss shall not exceed −10 dB within the band of interest:

Example 2: Third order Chebyshev Highpass Filter

Data from LTspice.