

Appendix A: Expression Syntax

(as of Version 7.1)

Expressions are always computed in complex arithmetic. Several unusual operators are available

R means 'resistance' so you can write "Ra". An unadorned number works.

X means 'multiply by j' so you can write (Ra+Xb)

j means the same thing. You can write (5+j10)

w means omega. You can write "jw5u" for an inductor of 5u

L means 'inductor with value' and is replaced by "jw" so you can say L5u

C means 'capacitor with value' and is replaced by "1/jw" so you can say C5p

I means 'value on the left of the F block'

T(Zl,length,Zo) transmission line.

S means square root. You can write S2 for square root of two.

"|" means 'in parallel' and has precedence between sum and product.

"^" means 'power'. 5^2 is 5 squared. 5^.5 is square root.

Other functions: Sin,Cos,Log,Exp,Real,Imag,Mag

Here's an example T matching equation: "(I + Ca) | Lb + Cc" and a Pi matching network might be "((I | Ca) + Lb) | Cc"

A not so formal definition follows:

<expression> := <sum>

<sum> := <parallel> or <sum> "+" <parallel> or <sum> "-" <parallel>

<parallel> := <product> or <product> "|" <parallel>

<product> := <unary> or <product> "*" <unary>
or <product> "/" <unary>

<unary> := "+" <unary>
or "-" <unary>
or <power>

<power> := <func> "^+" <func>
or <func> "^-" <func>
or <func> "^" <func>
or <func>

<func> := "C" <func> or "L" <func>
or "R"<parens> or "X"<parens>

or "S" <parens> or <BuiltIn>
or <parens>

<BuiltIn> := "Real("<sum>")" or "Imag("<sum>")"
or "Log("<sum>")" or "Exp("<sum>")" or "Mag("<sum
or "Sin("<sum>")" or "Cos("<sum>")" or "Sqrt("<sum>")"
or "T("<sum>,<sum>,<sum>)" // T(Zl,length,Zo)

<parens> := (<sum>) or <number>

<number> := <constant> or <variable> or <number> <number>

<constant> := <decimalNumber> [<units>]

<units> := "f" or "p" or "n" or "u" or "m" or "k" or "K" or "M" or "G" or "T" or "P"

<variable> := "a" or "b" or "c" or "d" or "e" or "f" or "g"
or "h" or "w" or "Pi" or "z" or "w"
or "I" // I is the value to the left of the F block.
or "xMtch" or "useZo" or "fixedV" //generator short form

<decimalNumber> := *Just what you would expect.*