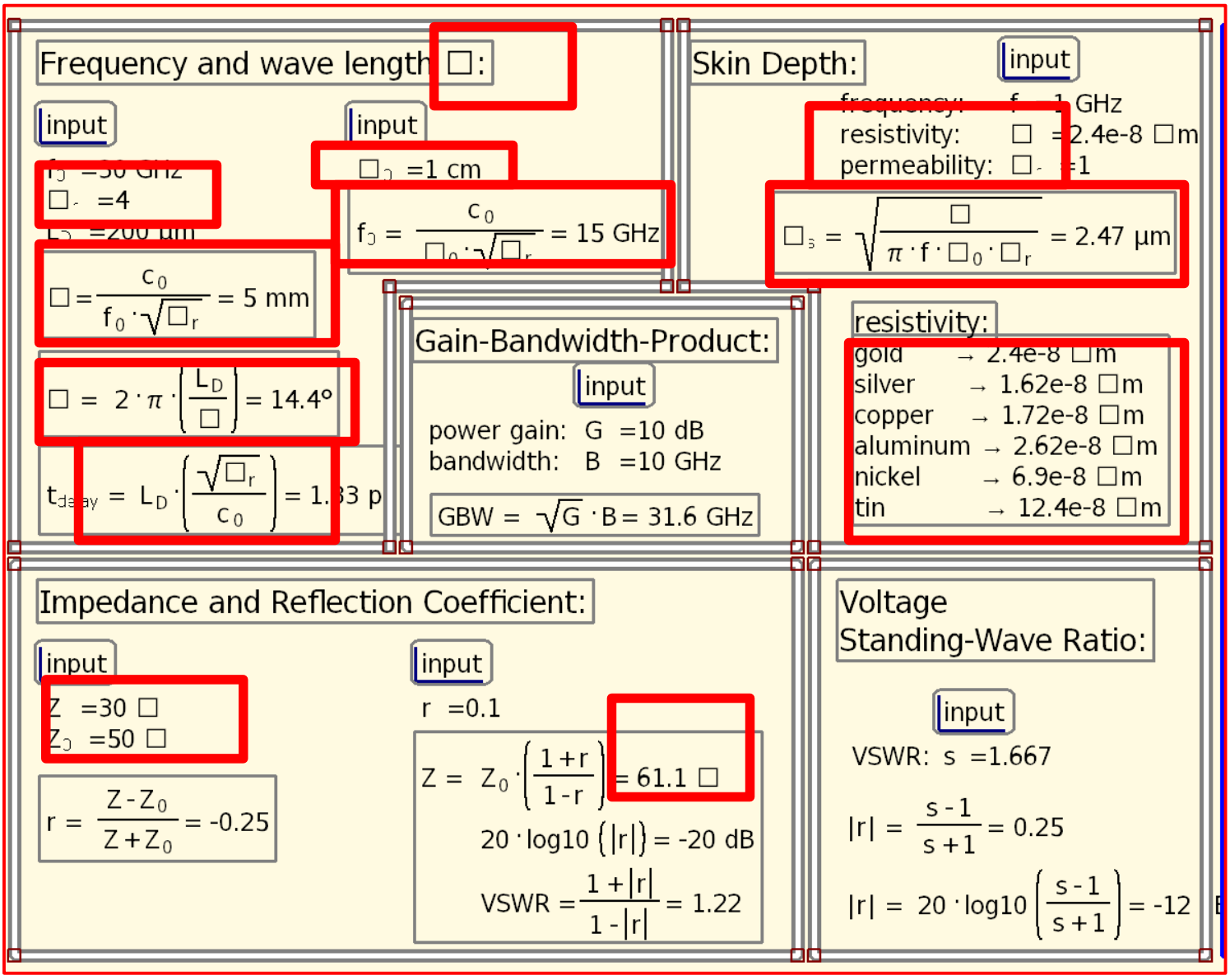
Frequency and wave length □:
input
f0 =30 GHz
□r =4
L□ =200 µm
□ = c0 / (f0 · √□r) = 5 mm
□ = 2 · π · (LD / □) = 14.4°
tdelay = LD · (√□r / c0) = 1.33 p
input
□0 =1 cm
f0 = c0 / (□0 · √□r) = 15 GHz
Gain-Bandwidth-Product:
input
power gain: G =10 dB
bandwidth: B =10 GHz
GBW = √G · B = 31.6 GHz
Skin Depth:
input
frequency: f =1 GHz
resistivity: □ =2.4e-8 □m
permeability: □r =1
□s = √(□ / (π · f · □0 · □r)) = 2.47 µm
resistivity:
gold → 2.4e-8 □m
silver → 1.62e-8 □m
copper → 1.72e-8 □m
aluminum → 2.62e-8 □m
nickel → 6.9e-8 □m
tin → 12.4e-8 □m
Impedance and Reflection Coefficient:
input
Z =30 □
Z0 =50 □
r = (Z - Z0) / (Z + Z0) = -0.25
input
r =0.1
Z = Z0 · ((1 + r) / (1 - r)) = 61.1 □
20 · log10 (|r|) = -20 dB
VSWR = (1 + |r|) / (1 - |r|) = 1.22
Voltage Standing-Wave Ratio:
input
VSWR: s =1.667
|r| = (s - 1) / (s + 1) = 0.25
|r| = 20 · log10 ((s - 1) / (s + 1)) = -12