Subiect nr. 1

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 8.91$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 458.63$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0251$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.78+0.03+0.46+1.64 = 3.9

F = 5.91dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.1 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.1 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=37.2dB - 5.91dB = 31.29 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.3 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.17 + 0.36 + 0.96 = 4.08

F = 6.11 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 8.5 dBm, $IP_{3in,IF}$ = 17.7 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 4.52 mW

$IP_{3,in}$ = 6.55 dBm

Subiect nr. 2

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 8.91$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 707.06$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0309$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.02+0.21+0.86 = 2.63

F = 4.21dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -76.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 85.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=31.8dB - 4.21dB = 27.59 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 43.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 27.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.71 + 0.36 + 0.82 = 3.48

F = 5.42 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 17.7 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.52 mW

IP$_{3,in}$ = 6.55 dBm

Subiect nr. 3

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 15.85 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 439.6 mW

$P_C = \frac{P_2}{10^{Lc/10}}$ = 0.0398 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.48+0.07+1.18+4.12 = 6.85

F = 8.36dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -72.6 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 79.6 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=32.2dB - 8.36dB = 23.84 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 34.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 32.4 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.23 + 0.28 + 1.02 = 4.12

F = 6.15 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 7.5 dBm, IP$_{3in,IF}$ = 16.6 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 3.81 mW

IP$_{3,in}$ = 5.8 dBm

Subiect nr. 4

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 367.33$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0316$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.66+0.08+1.11+3.93 = 6.78

F = 8.31dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -72.7 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=35.1dB - 8.31dB = 26.79 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.3 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 30. dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.93 + 0.21 + 0.85 = 3.57

F = 5.53 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.5 dBm, $IP_{3in,IF}$ = 15.5 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.17 mW

$IP_{3,in}$ = 5.01 dBm

Subiect nr. 5

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 14.13$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 546.85$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0331$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.48+0.1+0.87+3.27 = 5.72

F = 7.57dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -73.4 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.4 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=40.0dB - 7.57dB = 32.43 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 26.2 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.45 + 1.51 = 4.66

F = 6.68 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 18.3 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.56 mW

IP$_{3,in}$ = 6.59 dBm

Subiect nr. 6

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.08 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 970.76 mW

$P_C = \frac{P_2}{10^{Lc/10}}$ = 0.0339 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.62+0.09+0.45+1.92 = 4.08

F = 6.11dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -74.9 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 84.4 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=33.1dB - 6.11dB = 26.99 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 40.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 32.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.87 + 0.39 + 0.74 = 3.58

F = 5.54 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 7.0 dBm, IP$_{3in,IF}$ = 17.4 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 3.56 mW

IP$_{3,in}$ = 5.52 dBm

Subiect nr. 7

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 11.22$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 355.89$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0316$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.06+0.65+2.37 = 4.63

F = 6.66dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.3 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=32.7dB - 6.66dB = 26.04 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.5 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 32.7 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.36 + 0.81 = 3.86

F = 5.87 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 7.5 dBm, $IP_{3in,IF}$ = 17.3 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.85 mW

$IP_{3,in}$ = 5.86 dBm

Subiect nr. 8

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 348.79$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0257$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58+0.09+1.34+4.62 = 7.62

F = 8.82dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -72.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.7 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=31.6dB - 8.82dB = 22.78 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 30. dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.99 + 0.36 + 1.3 = 4.23

F = 6.27 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 8.0 dBm, $IP_{3in,IF}$ = 17.5 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 4.18 mW

$IP_{3,in}$ = 6.21 dBm

Subiect nr. 9

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.08 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 847.45 mW

$P_C = \frac{P_2}{10^{Lc/10}}$ = 0.0309 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.62+0.04+0.52+1.97 = 4.15

F = 6.18dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -74.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=36.0dB - 6.18dB = 29.82 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.8 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 35.3 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.93 + 0.18 + 0.31 = 3.0

F = 4.77 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.5 dBm, $IP_{3in,IF}$ = 14.7 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.64 mW

$IP_{3,in}$ = 4.22 dBm

Subiect nr. 10

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 339.67$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0331$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.07+1.19+4.21 = 7.01

F = 8.46dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -72.5 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 79.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=39.9dB - 8.46dB = 31.44 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 34.5 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 31.2 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.23 + 0.27 + 1.0 = 4.09

F = 6.11 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.5 dBm, $IP_{3in,IF}$ = 15.8 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.69 mW

$IP_{3,in}$ = 4.3 dBm

Subiect nr. 11

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 14.13$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 490.76$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0282$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.45+0.06+0.43+1.72 = 3.65

F = 5.62dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.4 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.9 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=38.4dB - 5.62dB = 32.78 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 24.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.87 + 0.34 + 0.82 = 3.62

F = 5.58 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 6.0 dBm, IP$_{3in,IF}$ = 16.7 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.98 mW

IP$_{3,in}$ = 4.74 dBm

Subiect nr. 12

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 6.31 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 419.46 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0269 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.55+0.04+0.69+2.37 = 4.65

F = 6.67dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -74.3 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 79.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=35.3dB - 6.67dB = 28.63 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 35.5 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.1 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.76 + 0.31 + 0.48 = 3.13

F = 4.96 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 6.0 dBm, IP$_{3in,IF}$ = 16.4 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.97 mW

IP$_{3,in}$ = 4.72 dBm

Subiect nr. 13

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 7.08$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 831.98$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0389$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.51+0.05+0.76+2.85 = 5.17

F = 7.14dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -73.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.3 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=34.5dB - 7.14dB = 27.36 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.7 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 29.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.23 + 0.23 + 0.95 = 4.0

F = 6.02 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.5 dBm, $IP_{3in,IF}$ = 15.7 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.19 mW

$IP_{3,in}$ = 5.03 dBm

Subiect nr. 14

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 8.91$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 360.13$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0263$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.74+0.04+0.46+1.88 = 4.12

F = 6.15dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=35.5dB - 6.15dB = 29.35 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 40.0 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 21.2 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.17 + 0.63 + 1.19 = 4.57

F = 6.6 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 19.3 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.63 mW

IP$_{3,in}$ = 6.65 dBm

Subiect nr. 15

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.08 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 654.8 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0372 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.45+0.03+0.51+1.88 = 3.87

F = 5.88dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -75.1 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.1 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=35.3dB - 5.88dB = 29.42 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.0 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.21 + 0.58 = 3.48

F = 5.41 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 6.0 dBm, IP$_{3in,IF}$ = 15.2 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.9 mW

IP$_{3,in}$ = 4.63 dBm

Subiect nr. 16

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 568.28$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0389$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.74+0.1+1.52+5.3 = 8.66

F = 9.37dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -71.6 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 79.6 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=30.8dB - 9.37dB = 21.43 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 34.5 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 30. dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.17 + 0.75 + 1.29 = 4.79

F = 6.81 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 9.0 dBm, $IP_{3in,IF}$ = 20.0 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 5.03 mW

$IP_{3,in}$ = 7.01 dBm

Subiect nr. 17

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 751.73$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0363$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.66+0.03+0.32+1.24 = 3.25

F = 5.12dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.9 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.9 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=39.9dB - 5.12dB = 34.78 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 40.8 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 26.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.71 + 0.47 + 1.41 = 4.17

F = 6.21 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 7.0 dBm, $IP_{3in,IF}$ = 18.0 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.59 mW

$IP_{3,in}$ = 5.55 dBm

Subiect nr. 18

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.08 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 511.81 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0269 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.74+0.08+0.86+3.27 = 5.94

F = 7.74dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -73.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 79.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=34.7dB - 7.74dB = 26.96 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 34.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 27.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.73 + 2.19 = 5.15

F = 7.12 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 9.0 dBm, $IP_{3in,IF}$ = 19.9 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 5.02 mW

$IP_{3,in}$ = 7.01 dBm

Subiect nr. 19

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 14.13$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 774.22$ mW

$P_C = \frac{P_2}{10^{L_C/10}} = 0.0269$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.06+0.65+2.54 = 4.8

F = 6.81dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.7 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=37.3dB - 6.81dB = 30.49 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.2 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33.9 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.81 + 0.16 + 0.39 = 2.94

F = 4.69 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.0 dBm, $IP_{3in,IF}$ = 14.1 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.39 mW

$IP_{3,in}$ = 3.79 dBm

Subiect nr. 20

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 390.45$ mW

$P_C = \frac{P_2}{10^{L_C/10}} = 0.0295$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.51+0.05+0.76+2.85 = 5.17

F = 7.14dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -73.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=38.9dB - 7.14dB = 31.76 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 34.2 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.32 + 1.4 = 3.97

F = 5.98 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 7.5 dBm, IP$_{3in,IF}$ = 17.0 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 3.83 mW

IP$_{3,in}$ = 5.84 dBm

Subiect nr. 21

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 6.31 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 520.83 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0269 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.45+0.06+0.48+1.92 = 3.92

F = 5.93dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^{9}\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -75. dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=37.8dB - 5.93dB = 31.87 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 30.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.23 + 0.29 + 1.19 = 4.29

F = 6.33 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 5.5 dBm, IP$_{3in,IF}$ = 16.0 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.7 mW

IP$_{3,in}$ = 4.32 dBm

Subiect nr. 22

Problema 1.

$C = 10 \log \frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 8.91$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 806.23$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0309$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.62+0.08+0.78+3.05 = 5.54

F = 7.43dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -73.5 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=35.0dB - 7.43dB = 27.57 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33.2 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.25 + 1.0 = 3.49

F = 5.43 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.0 dBm, $IP_{3in,IF}$ = 15.8 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.94 mW

$IP_{3,in}$ = 4.68 dBm

Subiect nr. 23

Problema 1.

$C = 10 \log \frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 346.78$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0263$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.66+0.09+1.2+4.31 = 7.26

F = 8.61dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -72.4 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.4 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=36.1dB - 8.61dB = 27.49 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 35.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 31.9 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.99 + 0.16 + 0.65 = 3.38

F = 5.29 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 5.0 dBm, IP$_{3in,IF}$ = 14.1 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.39 mW

IP$_{3,in}$ = 3.79 dBm

Subiect nr. 24

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 12.59 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 451.4 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0282 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.45+0.04+0.29+1.21 = 2.99

F = 4.75dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^{9}\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -76.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 85.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=31.2dB - 4.75dB = 26.45 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 41.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 31.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.93 + 0.33 + 0.73 = 3.57

F = 5.53 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 5.5 dBm, IP$_{3in,IF}$ = 16.5 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.72 mW

IP$_{3,in}$ = 4.35 dBm

Subiect nr. 25

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 14.13$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 702.85$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0288$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.7+0.04+0.41+1.6 = 3.76

F = 5.75dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=30.8dB - 5.75dB = 25.05 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.7 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 24. dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.76 + 0.34 + 0.67 = 3.36

F = 5.26 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 7.0 dBm, $IP_{3in,IF}$ = 17.0 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.54 mW

$IP_{3,in}$ = 5.49 dBm

Subiect nr. 26

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 6.31$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 772.14$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0339$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.78+0.03+0.54+1.97 = 4.32

F = 6.35dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.6 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.1 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=30.8dB - 6.35dB = 24.45 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.3 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33. dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.93 + 0.22 + 0.55 = 3.28

F = 5.16 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 5.0 dBm, IP$_{3in,IF}$ = 15.0 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.43 mW

IP$_{3,in}$ = 3.86 dBm

Subiect nr. 27

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 15.85 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 677.73 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0288 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.62+0.06+1.11+3.84 = 6.64

F = 8.22dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^{9}\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -72.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=30.8dB - 8.22dB = 22.58 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.7 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.45 + 2.02 = 5.16

F = 7.13 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 18.3 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.56 mW

IP$_{3,in}$ = 6.59 dBm

Subiect nr. 28

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 640.57$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0339$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.08+0.52+2.26 = 4.41

F = 6.44dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.5 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=30.6dB - 6.44dB = 24.16 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.2 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.3 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.27 + 0.65 = 3.16

F = 5.0 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.0 dBm, $IP_{3in,IF}$ = 15.7 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.46 mW

$IP_{3,in}$ = 3.91 dBm

Subiect nr. 29

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 386.87$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0347$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58+0.03+0.46+1.68 = 3.76

F = 5.75dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=37.8dB - 5.75dB = 32.05 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.5 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 22.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.05 + 0.54 + 1.71 = 4.89

F = 6.89 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.0 dBm, IP$_{3in,IF}$ = 18.7 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.25 mW

IP$_{3,in}$ = 6.29 dBm

Subiect nr. 30

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 8.91 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 360.96 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0295 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.74+0.07+1.17+4.12 = 7.09

F = 8.51dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -72.5 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=39.1dB - 8.51dB = 30.59 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 23.2 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.44 + 0.72 = 3.4

F = 5.31 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 7.0 dBm, IP$_{3in,IF}$ = 17.8 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 3.58 mW

IP$_{3,in}$ = 5.54 dBm

Subiect nr. 31

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 7.94$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 608.21$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0251$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.62+0.1+0.59+2.48 = 4.79

F = 6.81dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.7 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=35.3dB - 6.81dB = 28.49 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.3 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 23.1 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.35 + 1.17 = 4.21

F = 6.24 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.5 dBm, $IP_{3in,IF}$ = 16.9 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.25 mW

$IP_{3,in}$ = 5.12 dBm

Subiect nr. 32

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 10.0$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 708.34$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0363$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.51+0.02+0.78+2.66 = 4.97

F = 6.97dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74. dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=32.7dB - 6.97dB = 25.73 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.0 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.05 + 0.29 + 1.09 = 4.01

F = 6.03 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.0 dBm, $IP_{3in,IF}$ = 15.9 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.47 mW

$IP_{3,in}$ = 3.93 dBm

Subiect nr. 33

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 12.59 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 387.76 mW

$P_C = \frac{P_2}{10^{Lc/10}}$ = 0.0257 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.41+0.09+0.61+2.42 = 4.54

F = 6.57dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -74.4 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 83.9 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=34.2dB - 6.57dB = 27.63 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.05 + 0.22 + 0.54 = 3.4

F = 5.31 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.0 dBm, $IP_{3in,IF}$ = 15.4 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.91 mW

$IP_{3,in}$ = 4.65 dBm

Subiect nr. 34

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 7.08$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 426.69$ mW

$P_C = \frac{P_2}{10^{L_C/10}} = 0.0302$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.62+0.05+0.64+2.42 = 4.73

F = 6.75dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.2 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.7 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=31.9dB - 6.75dB = 25.15 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.4 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 29.1 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.18 + 0.5 = 2.91

F = 4.65 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.0 dBm, $IP_{3in,IF}$ = 14.4 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.41 mW

$IP_{3,in}$ = 3.81 dBm

Subiect nr. 35

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 14.13$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 554.45$ mW

$P_C = \frac{P_2}{10^{L_C/10}} = 0.0389$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.41+0.07+0.53+2.06 = 4.07

F = 6.09dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.9 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.4 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=32.7dB - 6.09dB = 26.61 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.1 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 26.1 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.47 + 1.71 = 4.87

F = 6.87 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 18.4 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.57 mW

IP$_{3,in}$ = 6.6 dBm

Subiect nr. 36

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.94 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 738.0 mW

$P_C = \frac{P_2}{10^{Lc/10}}$ = 0.0389 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.45+0.02+0.18+0.78 = 2.43

F = 3.86dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -77.1 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 82.6 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=37.6dB - 3.86dB = 33.74 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 40.3 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 25.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.81 + 0.4 + 1.39 = 4.19

F = 6.22 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 7.0 dBm, IP$_{3in,IF}$ = 17.5 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 3.57 mW

IP$_{3,in}$ = 5.52 dBm

Subiect nr. 37

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 618.1$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0398$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.7+0.08+0.63+2.48 = 4.88

F = 6.89dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.1 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.1 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=32.2dB - 6.89dB = 25.31 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.8 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 33.4 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.05 + 0.25 + 0.81 = 3.69

F = 5.67 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 5.5 dBm, $IP_{3in,IF}$ = 15.6 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 2.68 mW

$IP_{3,in}$ = 4.29 dBm

Subiect nr. 38

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 15.85$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 367.33$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0269$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.41+0.09+1.12+4.02 = 6.64

F = 8.22dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -72.8 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.8 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=37.7dB - 8.22dB = 29.48 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.7 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 23.9 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.11 + 0.4 + 1.42 = 4.51

F = 6.54 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 7.5 dBm, $IP_{3in,IF}$ = 17.6 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.87 mW

$IP_{3,in}$ = 5.88 dBm

Subiect nr. 39

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 14.13 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 529.5 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0302 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.7+0.06+0.69+2.66 = 5.11

F = 7.08dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -73.9 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.4 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=38.2dB - 7.08dB = 31.12 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.0 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 27.5 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.65 + 0.42 + 1.63 = 4.29

F = 6.32 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 6.5 dBm, $IP_{3in,IF}$ = 17.5 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.28 mW

$IP_{3,in}$ = 5.16 dBm

Subiect nr. 40

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 10.0$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 393.77$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0398$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.7+0.05+0.27+1.16 = 3.18

F = 5.02dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -76. dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=36.0dB - 5.02dB = 30.98 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 38.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 29.9 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.71 + 0.35 + 1.27 = 3.91

F = 5.92 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 7.0 dBm, $IP_{3in,IF}$ = 17.1 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 3.54 mW

$IP_{3,in}$ = 5.5 dBm

Subiect nr. 41

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 10.0$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 824.6$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0257$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.74+0.07+0.47+1.97 = 4.26

F = 6.29dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -74.7 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 80.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=36.6dB - 6.29dB = 30.31 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 36.3 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 25.8 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.81 + 0.26 + 0.63 = 3.29

F = 5.17 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 5.5 dBm, IP$_{3in,IF}$ = 15.7 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 2.69 mW

IP$_{3,in}$ = 4.3 dBm

Subiect nr. 42

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 6.31 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 369.57 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0324 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.45+0.07+0.48+1.97 = 3.96

F = 5.98dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^{9}\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -75. dBm

$DR = P_{in,1dB} - MDS_{in}$ = 84. dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N$_o$ [dB]=33.7dB - 5.98dB = 27.72 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 39.8 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 28.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.87 + 0.65 + 1.32 = 4.42

F = 6.45 dB

c) IP$_{3in,RF}$ = 12.0 dBm, IP$_{3in,M}$ = 8.5 dBm, IP$_{3in,IF}$ = 19.4 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

IP$_{3,in}$ = 4.63 mW

IP$_{3,in}$ = 6.66 dBm

Subiect nr. 43

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 12.59$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 717.08$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0389$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.55+0.03+0.37+1.46 = 3.41

F = 5.33dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.7 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.2 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=30.2dB - 5.33dB = 24.87 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.6 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 29.4 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF} \cdot \frac{1}{L}} + \frac{F_{RF}-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.17 + 0.59 + 1.01 = 4.35

F = 6.38 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 8.5 dBm, $IP_{3in,IF}$ = 19.1 dBm

$\frac{1}{IP_{3,in}} = \sum \frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 4.62 mW

$IP_{3,in}$ = 6.64 dBm

Subiect nr. 44

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}} = 7.08$ mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10} = 572.94$ mW

$P_C = \frac{P_2}{10^{Lc/10}} = 0.0339$ mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1 \cdot \frac{1}{L}} + \frac{F_2-1}{G_1 \cdot \frac{1}{L} \cdot \frac{1}{L_C}}$, in valori liniare

F = 1.41+0.05+0.36+1.53 = 3.35

F = 5.26dB

b) $kTB = 1.38 \cdot 10^{-38} \cdot 290 \cdot 10^9 \cdot 1000 = 4 \cdot 10^{-9}$mW

$MDS_{in} = 10 \cdot \log(kTB \cdot F) + 3dB$ = -75.7 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 81.7 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=31.0dB - 5.26dB = 25.74 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 37.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 21.6 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 0.71 + 0.73 + 2.49 = 5.51

F = 7.41 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 9.0 dBm, $IP_{3in,IF}$ = 19.9 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 5.02 mW

$IP_{3,in}$ = 7.01 dBm

Subiect nr. 45

Problema 1.

$C = 10\log\frac{P_1}{P_B} \rightarrow P_B = \frac{100mW}{10^{C/10}}$ = 7.94 mW

$P_A = (P_1 - P_B) * 10^{(G-L)/10}$ = 597.11 mW

$P_C = \frac{P_2}{10^{L_C/10}}$ = 0.0251 mW

Problema 2.

a) $F = F_1 + \frac{L-1}{G_1} + \frac{L_C-1}{G_1\cdot\frac{1}{L}} + \frac{F_2-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.66+0.04+0.84+3.05 = 5.59

F = 7.48dB

b) $kTB = 1.38\cdot10^{-38}\cdot290\cdot10^9\cdot1000$ = $4\cdot10^{-9}$mW

$MDS_{in} = 10\cdot\log(kTB\cdot F) + 3dB$ = -73.5 dBm

$DR = P_{in,1dB} - MDS_{in}$ = 78.5 dBm

c) $\left(\frac{S}{N}\right)_o = \frac{\left(\frac{S}{N}\right)_i}{F}$, in valori liniare

S/N_o [dB]=32.0dB - 7.48dB = 24.52 dB

d) $P_{out,1dB} = P_{in,1dB} + G - L - L_C + G_{IF} - 1dB$ = 33.9 dBm

Problema 3.

a) $G = -L + G_{RF} - L_C + G_{IF}$ = 24.4 dB

b) $F = L + \frac{F_{RF}-1}{\frac{1}{L}} + \frac{L_C-1}{G_{RF}\cdot\frac{1}{L}} + \frac{F_{RF}-1}{G_1\cdot\frac{1}{L}\cdot\frac{1}{L_C}}$, in valori liniare

F = 1.58 + 1.23 + 0.5 + 0.79 = 4.11

F = 6.14 dB

c) $IP_{3in,RF}$ = 12.0 dBm, $IP_{3in,M}$ = 8.5 dBm, $IP_{3in,IF}$ = 18.6 dBm

$\frac{1}{IP_{3,in}} = \sum\frac{1}{IP_3}$, in valori liniare

$IP_{3,in}$ = 4.58 mW

$IP_{3,in}$ = 6.61 dBm