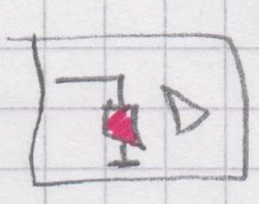
Aufgabe 3.7

$Z_R = 75\Omega$

$L_p = 23\,dB$

$B = 100\,MHz$

$\vartheta = 21°C \rightarrow T = 294\,K$



a) $P_N = kTB = 1{,}38 \cdot 10^{-23}\,Ws/K \cdot 294K \cdot 100MHz$

$= 406\,fW = 0{,}406\,pW$

b) $L_S = 86\,dB\mu = (80+6)\,dB\mu$

$U_S = 10^4 \cdot 2\,\mu V$

$= 0{,}02\,V$

$P_S = \frac{U_S^2}{Z_R} = \frac{(0{,}02V)^2}{75\Omega} = 5{,}3\,\mu W$

$SNR = \frac{P_S}{P_N} = \frac{5{,}3\,\mu W}{0{,}406\,pW} = 13 \cdot 10^6$

$SNR|_{dB} = 10\,lg\,SNR\,dB = \underline{71{,}2\,dB}$

c) $L_{S2} = L_S + L_p$

$= 86\,dB\mu + 23\,dB = 109\,dB\mu$

Kann man so machen mit den Einheiten, da es sich um Pseudo Einheiten handelt?