$SNR_{BB} = \frac{W_R^U}{W_N^{BB}}$

PI/PR : $W_R^U = W_R \cdot \Pi$ → PI : $\Pi < \frac{1}{2}$; PR : $\frac{1}{2} \leq \Pi < 1$

$W_R^U = W_T^U - A$

$SNR_{BB} = SNR_{RF}$ (BLU)

$SNR_{RF} = \frac{W_R^U}{W_N^{RF}}$

PS : $W_R^U = W_R$

$W_R = W_R^U + W_R^P$

$A_{CAVO}^{dB} = A_c \cdot d^{Km} \cdot \sqrt{f_p}^{MHz}$

$W_N^{RF} = \frac{1}{2} \cdot K \cdot T_S \cdot B_{RF}$

$B_{RF} = 4B$ (BLD) $- 2B$ (BLU) $- 4B_C$ (FM)

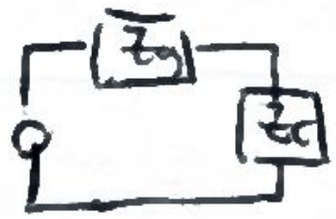
$A_{RADIO}^{dB} = 32.44 + 20\log_{10}(f_p \cdot d) - G_T - G_R$ (MHz, Km)

$SNR_{FM}^{DD} = SNR_{RF} \cdot 3 \cdot \Sigma_f^2$

$W_N^{BB} = K \cdot T_S \cdot B$

POTENZA TRASFERITA:

$W_{ZC} = P_{Vg} \frac{R_C}{|Z_C + Z_g|^2}$



$y^2 = \frac{3}{2} \frac{SNR_{DD}}{L^2 - 1}$ → PRESA IN TABELLA

$B_C = B \cdot (I_R + 1)$

$T_A = \frac{4 \cdot T_0}{3}$

$K = 1.38 \cdot 10^{-23}$

SE MTP : $W_{ZC} = W_{Vg} = \frac{P_{Vg}}{4 R_g} V^2$

$B = \frac{f_b}{2 \log_2 L} (1 + r)$

$T_S = T_A + T_0 (F_{TOT} - 1)$

$T_0 = 296°K$

$F_{TOT} = F_1 + \frac{F_2 - 1}{G_1} + \frac{F_3 - 1}{G_1 G_2} + \dots$

MTP = $Z_C(f) = Z_g^*(f)$

ADATTAMENTO = $Z_C(f) = Z_g(f)$

$dB = 10 \log_{10}(x)$

$dB_m = 10 \log_{10}(x \cdot 10^3)$

• $dB + 3C$

$G = \frac{1}{A}$ E AZF IN FILTRI PASSIVI

SE $2B \ll f_p$, BANDA STRETTA, IGNORO (f)

$f_L = \frac{f_b}{\log_2 L}$

$f_b = N \cdot f_s \cdot N_C$ [Hz]

$Z_i = R_i + i 2\pi f_p L_i + i 2\pi f_p C_i$

[V]
$V_{EFF} = \sqrt{P_{Vg}}$

SE $\rho \neq 0$ → $B = \frac{f_b}{c(1-\rho)\log_2 L} (1 + r)$ con $\rho \leq \frac{N \log_2 L - K}{N \log_2 L}$

FIBRA:

$W_R^{OPT} = N_{f/s} \cdot E_f$

$N_{f/s} = N_{f/b} \cdot R_b$

$A_{dB} = A_0 \cdot d_{km}$

$E_f = h \frac{c}{\lambda}$ [J]

$\lambda = \frac{v}{f}$

DEVE ESSERE:

$W_R^{OPT} \geq S \cdot R_b \cdot E_f$

OPPURE $N_{f/b} \geq S$

$q = 1.6 \cdot 10^{-19}$ C

$c = 3 \cdot 10^8$

$h = 6.624 \cdot 10^{-34}$ J·s

$W_T^{OPT} = G \cdot M \cdot \eta_E \frac{1}{q} E_f$ (G = 1 LED)

$i_{OUT}^{PIN} = \eta \frac{W_R}{h f} q$

$i_{APD}^{OUT} = G \cdot \eta \cdot \frac{W_R}{h f} q$

$M_{ODI} \approx \frac{4}{\pi^2} V^2$

$V = 2\pi \frac{d_1}{2\lambda_c} \Delta$

FINESTRA	λ (m)	A_0 (dB/km)
1	850	2
2	1330	0.4
3	1550	0.2