3) $R_b = 10\,Kbps$ $\quad V = 850\,Km/h$ $\quad \alpha = 0{,}35$ $\quad f = 1{,}2\,GHz$

$M = ?$ para desvanecimento lento

$V = 850\,km/h = \frac{850 \cdot 10^3}{3{,}6 \cdot 10^3} = \frac{850}{3{,}6} = 236{,}11\,m/s$

$f_D = \frac{1}{2}$

$f_D = \frac{V}{\lambda}\cos\phi = \frac{V}{\lambda}$ $\quad \lambda = \frac{c}{f} = \frac{3 \cdot 10^8}{1{,}2 \cdot 10^9} = \frac{3}{12} = 0{,}25\,m$

$f_D = \frac{236{,}11}{0{,}25} = 944{,}44\,Hz$ $\quad T_c \approx \frac{1}{2 f_D} = \frac{1}{2 \cdot 944{,}44}$

$\approx \frac{1}{1888{,}88}$

$= 5{,}29 \cdot 10^{-4}\,s$

$= 52{,}9 \cdot 10^{-3}\,s$

$T_c = 52{,}9\,ms$

$W = \frac{1+\alpha}{2T}$

$B_D = 2 \cdot f_D = 1888{,}88\,Hz$

$B_D = 1{,}88\,KHz$

$B = \frac{(1+\alpha) R_b}{\log_2 M} = \frac{10.000\,(1+0{,}35)}{\log_2 M} = \frac{10.000 \times 1{,}35}{\log_2 M}$

$B = \frac{13500}{\log_2 M}$ $\Rightarrow$ $T_s = \frac{1}{\frac{13500}{\log_2 M}} = \frac{\log_2 M}{13500}$

para Desvanecimento lento

$B > B_D \Leftrightarrow \frac{13500}{\log_2 M} > 1888{,}88$

$\Rightarrow 13500 > 1888{,}8 \log_2 M \Rightarrow \frac{13500}{1888{,}8} > \log_2 M$

$\log_2 M < 7{,}17$

$M < 2^{7{,}17}$

$M < 141$

$\Rightarrow$ $M_{max} = 128$