Link Budget Calculation

Received power (dBm) = Transmitted power (dBm) + gains (dB) - losses (dB)

d = 100ft = 33.33m

λ = 1.90E-01m

Free Space Path Loss = -10 X $\log_{10}[(4\pi d/\lambda)^2]$ = -66.09dB

T_{power} = -130dB

$G_{receivingantenna}$ = 35dB

L_{cable} = -12dB

$G_{transmittingantenna}$ = 33dB

ERP=T_{power}+$G_{receivingantenna}$-L_{cable}+$G_{transmittingantenna}$-Free Space Path Loss = -130 +3 3 – 12 + 35 – 66.09 = -140.09dB @100ft

dB to Watts dB=10log(W/1x10^{-3}) => W = $\log^{-1}$(dB/10)

Power Radiated at 100ft W = $\log^{-1}$(-140.09/10)*1x10^{-3} = 9.8E-18W

System Gain = 56dB

Radiated Power at the repeater = T_{power} + System Gain = -130dB + 56dB = -74dBm

Effective Radiated Power(dBW) = Radiated Power - 30 = -74 - 30 = -104dBW @antenna

Effective Radiated Power(W) = 10^(Effective Radiated Power / 10) = 10^(-104/ 10) = 39.81E-12W

Transmitted Power(W) = 10^((Effective Radiated Power – 3) / 10) = 10^(-104- 3 / 10) = 19.95E-12W