

2.4

$$P_r \approx G_r G_t \left( \frac{h_T h_R}{d^2} \right)^2 P_t$$

$$3 \text{ m: } P_r = 38.9 \mu\text{W}$$

$$5 \text{ m: } P_r = 296 \mu\text{W}$$

$$10 \text{ m: } P_r = 4.74 \text{ mW}$$

$$d = 10^3 \text{ m}$$

$$G_r = 15 \text{ dBi}$$

$$G_t = 20 \text{ dBi}$$

$$P_t = 150 \text{ W}$$

$$P_r = 4P_t \left( \frac{\lambda}{4\pi d} \right)^2 G_r G_t \sin^2 \left( \frac{2\pi h_T h_R}{d\lambda} \right)$$

$$5 \text{ m: } P_r = 4 \cdot 150 \left( \frac{0.3}{4\pi \cdot 10^3} \right)^2 31 \cdot 100 \cdot \sin^2 \left( \frac{2\pi \cdot 5 \cdot 5}{10^3 \cdot 0.3} \right) = 296 \mu\text{W}$$

$$10 \text{ m: } P_r = 4.74 \text{ mW}$$