

**FCC part 1.1310(A) /
Health Canada Safety Code 6**

*Maximum Permissible Exposure (MPE) evaluation
For Occupational/controlled environments*

Determine the minimum safe distance from the transmitter where a power density of $(f_{\text{MHz}}/300)\text{mW}/\text{cm}^2$ is not exceeded (the Canadian limit is $f/30$, but the FCC limit is more stringent). The power density is calculated as:

$$P_d = P_t * G / 4\pi r^2, \text{ where:}$$

P_d power density in watts

P_t transmit power in watts

G numeric antenna gain

r distance between body and transmitter in centimeters

$$\text{Max } P_d = 960/300 = 3.2\text{mW}/\text{cm}^2$$

$$P_t = +23\text{dBm} = 200\text{mW}$$

$$G = 2.1\text{dBi} = 1.62 \text{ numeric gain}$$

$$r = 20\text{cm}$$

$$\text{Duty Cycle} = 19.44\%$$

- When transmitting, the duty cycle is 50%
- Transmit cycle is 3.5 seconds transmit, 5.5 seconds receive
- $0.5 * [3.5 / (3.5 + 5.5)] = 19.44\%$

$$(200\text{mW}) * (1.62) * (.1944) / [4\pi(20\text{cm})^2] = .013 \text{ mW}/\text{cm}$$

Or, solving for minimum distance:

$$R = [(200\text{mW}) * (1.62) * (.1944) / (4\pi * 3.2\text{mW}/\text{cm}^2)]^{1/2} = 1.25 \text{ cm}$$