RF Exposure

The MPE distance will be calculated for the worst case of 100% transmitter duty cycle, transmitter power of 4 dBm (3.162 mW), and 3.3 dBi (2.14) antenna gain.

For an isotropic radiator, the surface area of a sphere can be used to determine the area over which the transceiver energy is radiated.

The surface area of a sphere = $4*\pi*\text{radius}^2$

In the case where there is an antenna gain, the worst case energy density is increased by the antenna gain. In this case, the exposure level can be calculated as follows:

Exposure Level (mW/cm^2) = $(P*C*G)/(4*\pi*D^2)$

P (Transmitter output power) = 2.512 mW
G (Antenna gain) = 2.14
D (Distance) = 20 cm
C (Duty cycle) = 1

For this transmitter:

Exposure Level (mW/cm^2) = $(2.512*1*2.14)/(4*\pi*20^2)$ = 0.0011 mW/cm^2

It should be noted that the above calculations are based on absolute worst-case scenarios that will not occur in normal use. The actual duty cycle is never more than 2%.