Maximum Public Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, d, of 20 cm from the EUT.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Therefore, for:

MPE for 2400 MHz – 2483.5 MHz

Limit: 1 mW/cm^2
Peak Power (dBm) = 21.2 dBm
Peak Power (Watts) = 0.132 W
Gain of Transmit Antenna = 2.8 dB_i = 1.91, numeric
d = Distance = 20 cm = 0.2 m

$S = (PG/ 4\pi d^2)$ = EIRP/4A = 0.132*(1.91)/4*π*0.2*0.2
=0.2515/0.5030 = 0.5000 W/m^2
= (0.5000 W/m^2) (1m^2/W) (0.1 mW/cm^2)
= 0.05000 mW/cm^2

which is << less than S = 1 mW/cm^2

Therefore, for:

MPE for 4410.5 MHz (UWB Radio #1)

Limit: 1 mW/cm^2
Peak Power (dBuV/m) = 72.89 dBuV/m @ 3
Peak Power (dBm) = 72.89 dBuV/m + 20 log(3) – 104.8 = -22.31 dBm
Peak Power (Watts) = 0.000006 W
Gain of Transmit Antenna = 2.7 dB_i = 1.86, numeric
d = Distance = 20 cm = 0.2 m

$S = (PG/ 4\pi d^2)$ = EIRP/4A = 0.006*(1.86)/4*π*0.2*0.2
=0.0110/0.5030 = 0.0218 W/m^2
= (0.0218 W/m^2) (1m^2/W) (0.1 mW/cm^2)
= 0.00218 mW/cm^2

which is << less than S = 1 mW/cm^2

MPE for 4410.5 MHz (UWB Radio #2)

Limit: 1 mW/cm^2
Peak Power (dBuV/m) = 72.89 dBuV/m @ 3
Peak Power (dBm) = 72.89 dBuV/m + 20 log(3) – 104.8 = -22.31 dBm
Peak Power (Watts) = 0.000006 W
Gain of Transmit Antenna = 2.7 dB_i = 1.86, numeric
d = Distance = 20 cm = 0.2 m

$S = (PG/ 4\pi d^2)$ = EIRP/4A = 0.006*(1.86)/4*π*0.2*0.2
=0.0110/0.5030 = 0.0218 W/m^2
= (0.0218 W/m^2) (1m^2/W) (0.1 mW/cm^2)
= 0.00218 mW/cm^2

which is << less than S = 1 mW/cm^2

Summation:

0.00218 mW/cm^2 + 0.00218 mW/cm^2 = 0.0435 mW/cm^2

which is << less than S = 1 mW/cm^2