Prediction of MPE limit at given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where: S = Power density
P = Power input to the antenna
G = Antenna gain
R = Distance to the center of radiation of the antenna

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm^2)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

Prediction:
P Max power input to the antenna at 2.4 GHz: 23.3 dBm
P Max power input to the antenna at 5.2 GHz: 14.1 dBm
P Max power input to the antenna at 5.8 GHz: 14.4 dBm

Antennas for 2.4 GHz operation:.
OB-002 9 dBi DZ-PCKO-11034-0   Gain: 9 dBi
OB-003 12 dBi DZ-PCKO-11034-1   Gain: 12 dBi
PA-M01 12 dBi DZ-PCKO-11035-0   Gain: 12 dBi
PA-L01 18 dBi DZ-PCKO-11035-1; min 20m Ecoflex 10 cable; fixed point to point operation
                                       Gain: 18-22,5 dB/100m =13.5 dBi
Max EIRP for 2.4 GHz operation: 36.8 dBm

Antennas for 5.2 GHz operation:
OB-008 12 dBi DZ-PCKO-11036-0; min 14m Ecoflex 10 cable; Gain= 12-35.9/100m = 6.98 dBi
PA-M02 14 dBi DZ-PCKO-11037-0; min 20m Ecoflex 10 cable; Gain= 14-35.9/100m = 6.82 dBi
PA-L02 20 dBi DZ-PCKO-11037-1; min 37m Ecoflex 10 cable; Gain= 20-35.9/100m = 6.72 dBi
Max EIRP for 5.2 GHz operation: 21.1 dBm

Antennas for 5.8 GHz operation:
PA-M02 14 dBi DZ-PCKO-11037-0; Gain= 14 dBi
PA-L02 20 dBi DZ-PCKO-11037-1; Gain= 20 dBi
Max EIRP for 2.4 GHz operation: 34.4 dBm

This prediction demonstrates the following:
The power density level at a distance of 20 cm with each antenna is below the maximum levels allowed by FCC regulations.

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