Maximum Permissible Exposure (MPE) Calculation

Reference document:	**47 CFR §15.247(i) & §1.1310**	
Test Requirements:	According to §1.1310, the criteria listed in tab. 1 shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b). For equipment authorization purposes the term co-location refers to simultaneously transmitting (co-transmitting) antennas located within 20cm of each other within a product.	
Limit	1mW/cm^2	**Comply**
Calculation Result*:	**Power Density =** **0.138 mW/cm2** on a 20cm radius sphere for 900 MHz **0.023 mW/cm2** on a 20cm radius sphere for 2.4 GHz	

The device is capable of operating in the ranges 905-925 MHz & 2403- 2475 MHz non-simultaneously with a maximum conducted power of 219 mW and 37 mW per antenna chain respectively into a single antenna with a 2 dBi Antenna.RF exposure compliance is with respect to the aggregate exposure from all chains. When operating two chains transmitting simultaneously, the worst case prediction occurs as shown in table below.

* Equation (3) given in OET Bulletin 65 is used to estimate the MPE distance.

The maximum exposure level in this scenario is 0.138 mW/cm^2 at a distance of 20 cm for 900 MHz band

-The maximum exposure level in this scenario is 0.023 mW/cm^2 at a distance of 20 cm for 2.4 GHz band

* Equation (3) given in OET Bulletin 65 is used to estimate the MPE distance.

$$S = \frac{PG}{4\pi R^2}$$

S=power density, in mW/cm^2
P=power input to the antenna, in mW
G=numeric gain of the antenna,
R= distance to the center of the antenna, in cm

Frequency Band (GHz)	MPE Distance [cm]	Output Power per chain [mW]	Antenna Gain [dBi]	Aggregate Power density [mW/cm^2]	Limit [mW/cm^2]	Margin [mW/cm^2]
Two chains , transmitting simultaneously, Worst-Case						
0.9	20	219	2	0.138	1	0.862
2.4	20	37	2	0.023	1	0.977