

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 = 0.1358mW/cm² on a 20cm radius sphere.	

The device is capable of operating in the 2.404-2.4745 GHz. The maximum conducted power is 107.89 mW per antenna chain. For simultaneous transmission, RF exposure compliance is with respect to the aggregate exposure from all simultaneously transmitting transmitters/antennas. 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.

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

S=power density, in mW/cm²

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						
2.4	20	107.89	5	0.1358	1	0.8642