

RF EXPOSURE EVALUATION

1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ;

*=Plane-wave equivalent power density

2 Maximum Permissible Exposure (MPE) Evaluation

Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (mW)
2414.250	15.27	33.651157	125
2437.875	15.83	38.282474	125
2461.500	16.72	46.989411	125

Maximum peak output power at antenna input terminal:	16.72	(dBm)
Maximum peak output power at antenna input terminal:	46.989411	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2461.500	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.018649	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.018649 mW/ cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2461.5MHz.