

5. RF exposure statement

According to §1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range [MHz]	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm ²]	Averaging Time [minute]
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 – 1500	-	-	f/1500	30
1500 – 100 000	-	-	1.0	30

※ f = frequency in MHz

5.1 Friis transmission formula

$$P_d = \frac{P_{out} \times G}{4\pi \times R^2}$$

P_d = Power density

P_{out} = power input to antenna

G = power gain

R = distance to the center of radiation of the antenna

$$R = \sqrt{\frac{P_{out} \times G}{4\pi \times P_d}}$$

5.2 Calculation of MPE

Frequency [MHz]	Output power [dBm]	Antenna gain [dBi]	Average power		Power density at 20cm [mW/cm ²]	Limit [mW/cm ²]
			[dBm]	[mW]		
2 402.0	1.67	3.90	5.57	3.61	0.000 718	1.0
2 440.0	1.65	3.40	5.05	3.20	0.000 637	1.0
2 480.0	0.65	3.00	3.65	2.32	0.000 461	1.0

5.3 Evaluation of exclusion of SAR testing

The distance from EUT to human body can be below 5 mm.

For test separation distances ≤ 50 mm

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \\ = (3.61 / 5) \times \sqrt{2.402} = 1.12$$

The evaluation 1.12 is lower than 3.0 for 1-g SAR, and SAR test is not required.