

RF Exposure

Reference: CFR 47 FCC Part 1.1310

Description: The worse-case of each power setting and frequency were investigate to report the worse-case power density at the specified distance.

All measurements were peak or RMS power readings taken from test reports from accredited test labs. Antenna gains were taken from the manufacturer’s specifications.

Limits: Maximum exposure limits from CFR 47, FCC Part 1.1310:

Table 1 - Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) 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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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Calculations:

Transmitter	Frequency	Antenna Gain*	Duty cycle	Power	Power	Power + 10%	Power Density	Limit at specified distance	% of limit	Type
	MHz	numerical		dBm	mW	mW	mW/cm ²	mW/cm ²	Percent of limit	
1	902.3	1	100%	17.66	58.34	64.18	0.01277	0.60	2.12%	Peak
1	908.5	1	100%	16.76	47.42	52.17	0.01038	0.61	1.71%	Peak
1	914.9	1	100%	16.43	43.95	48.35	0.00962	0.61	1.58%	Peak

PASS?	YES
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The power density is calculated as shown below:

$$S = (P \times G \times DC) / (4 \times \pi \times d^2) - \text{used to calculate exposure at 20 cm}$$

$$d = \sqrt{(S / (P \times G)) \times 4 \times \pi} - \text{used to calculate minimum distance to meet limits}$$

$$1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

S= power density P = transmitter power (in mw). G = antenna numeric gain d = distance to radiation center

DC = Duty Cycle *Power values taken from EIRP, so antenna gain was set to 1 (numeric)



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