

## FCC §15.319 (i) & §2.1091 - RF RADIATION EXPOSURE

### Limit

According to FCC KDB 447498, section 7 (ii), The antenna separation distance and MPE compliance boundary requirements that enable all simultaneous transmitting antennas incorporated within the host to comply with MPE limits are specified in the application filing of at least one of the certified transmitters incorporated in the host device.<sup>32</sup> In addition, when transmitters certified for portable use are incorporated in a mobile host device the antenna(s) must be  $\geq 5$  cm from all other simultaneous transmitting antennas. All antennas must be at least 20 cm from users and nearby persons.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
<b>Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	842/f	2.19/f	*(180/f <sup>2</sup> )	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

\* = Plane-wave equivalent power density

### Test Data

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

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

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator,

The power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

MPE Calculation:

Frequency (MHz)	Peak Output Power (dBm)	Antenna Gain (dBi)	Minimum Distance (cm)	Calculation result (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )	Result
1921.536	15.15	0	20	0.0065	1.0	Pass

**Result:** The device meets FCC MPE limit at 20 cm distance.