

## MPE Calculation

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

### Part 1.1310 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 (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/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

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

## Test Procedure

An MPE evaluation was performed in order to show that the device was compliant with §2.1091. The maximum power density was calculated at a separation distance of 20 cm.

The maximum RF exposure at a 20 cm distance is calculated using the formula:

$$\text{ConductedPower}(mW) = 10^{\text{ConductedPower}(dBm)/10}$$

$$\text{EIRP}(mW) = \text{ConductedPower}(mW) * \text{Ant. Gain}$$

$$\text{PowerDensity}(mW/cm^2 \text{ at } 20cm) = \frac{\text{EIRP}(mW)}{4\pi * (20cm)^2}$$

## Results

The following calculations show that the power density at 20 cm is less than the limit for general population / un-controlled exposure and that the MPE calculations are less than the applicable limit. The device meets the RF exposure limit at a 20 cm separation distance as required by part 2.1091 of the FCC rules.

## Radio Test Results:

### DMP Wireless 915 Band Transmitter:

Frequency	915 MHz
Limit	0.61 mW/cm <sup>2</sup>
Distance	20 cm
Maximum Scaled Power	9.87 dBm = 9.71 mW
TX Ant Gain	1.5 dBi
EIRP	11.37 dBm = 13.71 mW
<b>Power Density</b>	<b>2.73 μW / cm<sup>2</sup> at 20 cm</b>
<b>MPE / Limit Ratio</b>	<b>0.0045</b>