Appendix 11. RF Exposure Requirement

§ 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.

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cmW2W)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/fW2W)	6
30-300	61.4	0.163	1.0	6
300-1500	.....	.....	f/300	6
1500-100,000	.....	.....	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/fW2W)	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.

1.1 Test Procedure

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

For each transmitter the maximum RF exposure at a 20 cm distance using the formula:

$$PowerDensity = \frac{ConductedPower_{mW} \times Ant.Gain}{4\pi \times (20_{cm})^2}$$

1.2 Results:

The following calculations show that the total power density from each transmitter at 20cm is less than the limit for general population / un-controlled exposure. The device meets the RF exposure limit at a 20cm separation distance as required by part 2.1091 of the FCC rules when used with an antenna not exceeding the maximum antenna gain noted in the following table.

Test Summary

Frequency(Mhz)	Maximum Antenna Gain(dBi)	MPE @ 20cm(mW/cm^2)	Test Result
837.00	1.98	0.129	Compliant
1880.00	1.98	0.136	Compliant

Cell Band

Frequency	837.00 Mhz
Limit	0.558 mW/cm^2
Distance	20 cm
Power	25.16 dBm
Tx Ant Gain	1.98 dBi
EIRP	27.14 dBm
ERP	25.00 dBm
Power Density	0.129 mW/cm^2

PCS Band

Frequency	1880.00 Mhz
Limit	1 mW/cm^2
Distance	20cm
Power	25.39 dBm
Tx Ant Gain	1.98 dBi
EIRP	27.37 dBm
ERP	25.23 dBm
Power Density	0.136 mW/cm^2