5 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1 Applicable Standard

According to FCC 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for Maximum Permissible Exposure (MPE)

Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time |E|, |H| or S (minutes)
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
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

f = frequency in MHz;
* = Plane-wave equivalent power density;

According to RSS-102 § 4Table 6, RF Field Strength Limits for Devices Used by the General Public (Controlled Environment)

Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[23]	170	180	-	Instantaneous*
0.1-10	-	$1.6/f$	-	6**
1.29-10	$193/f^{0.5}$	-	-	6**
10-20	61.4	0.163	10	6
20-48	$129.8/f^{0.25}$	$0.3444/f^{0.25}$	$44.72/f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	$15.60\ f^{0.25}$	$0.04138\ f^{0.25}$	$0.6455f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	$616000/f^{1.2}$
150000-300000	$0.354\ f^{0.5}$	$9.40 \times 10^{-4}\ f^{0.5}$	$3.33 \times 10^{-4}\ f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

5.2 MPE Calculation

Prediction of power density at the distance of the applicable MPE limit

$$S = PG/4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm^2);
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
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

5.3 MPE Results

For FCC 2.1091:

Frequency (MHz)	Antenna Gain		Maximum Average output power including Tune-up Tolerance (mW)	Operation Duty Cycle (%)	Evaluation Distance (cm)	Power Density (mW/cm^2)	Power Density Limit (mW/cm^2)
	(dBi)	(numeric)					
88-108	0	1.0	10000	100	40	0.4974	1

Note: the maximum power including Tune-up Tolerance is 10 Watts.

Result: The device meet FCC MPE at 40 cm distance

For RSS-102:

Frequency (MHz)	Antenna Gain		Maximum Average output power including Tune-up Tolerance (mW)	Operation Duty Cycle (%)	Evaluation Distance (cm)	Power Density (W/m^2)	Power Density Limit (W/m^2)
	(dBi)	(numeric)					
88-108	0	1.0	10000	100	40	4.974	6.455

Note: the maximum power including Tune-up Tolerance is 10 Watts.

Result: The device meet ISEDC MPE at 40 cm distance

******* END OF REPORT *******