



NCEE Labs
4740 Discovery Drive
Lincoln, NE 68521
402-323-6233

FCC ID: RWB-MT9100STM
IC:115A-MT9100STM

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

Table 1 - From Table 4 of RSS-102 Issue 5

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}
Note: <i>f</i> is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).				

The limit was converted from W/cm² to mW/m² by dividing by 10

$$(W \rightarrow mW = 1000) / (/m^2 \rightarrow /cm^2 = 10000) = \times 0.01$$

The power density is calculated as shown below:

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

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

S = power density

P = transmitter conducted power (in mW)

G = antenna numeric gain

D = distance to radiation center (20 cm)

Table 2 – Power Density Calculations

Frequency	Antenna Gain	Output power	Power Density at 20cm	FCC Limit	IC Limit
MHz	numeric	mW	mW/cm ²	mW/cm ²	mW/cm ²
1616.232460	4.00	91.83	0.0731131	1.0000	0.40815678
1611.232460	4.00	99.77	0.0794347	1.0000	0.40729344
912.000000	1.63	2.09	0.0006781	0.6100	0.27605522
921.000000	1.63	2.86	0.0009279	0.6140	0.27791407

It is expected that a 20cm separation will be maintained at all times.

The ISM and the satellite radio are prevented from simultaneous operation through the firmware.

$$2.14 \text{ dBi} = 10^{(2.14/10)} = 1.64 \text{ (numeric)}$$