14. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

14.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
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
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

14.2 Maximum Permissible Exposure (MPE) Evaluation (Worst Case)

802.11a_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6M	**12.64**	**18.365**	23.98	PASS
44	5220	6M	12.58	18.113	23.98	PASS
48	5240	6M	12.54	17.947	23.98	PASS
52	5260	6M	12.51	17.824	23.98 or 11+10log(B) = 23.19	PASS
60	5300	6M	12.51	17.824	23.98 or 11+10log(B) = 23.19	PASS
64	5320	6M	**12.65**	**18.408**	23.98 or 11+10log(B) = 23.19	PASS
100	5500	6M	**12.55**	**17.989**	23.98 or 11+10log(B) = 23.18	PASS
116	5580	6M	12.51	17.824	23.98 or 11+10log(B) = 23.18	PASS
140	5700	6M	12.54	17.947	23.98 or 11+10log(B) = 23.18	PASS
149	5745	6M	12.52	17.865	30	PASS
157	5785	6M	**12.58**	**18.113**	30	PASS
165	5825	6M	12.56	18.030	30	PASS

MPE Prediction (802.11a)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

Where: S = Power density

P = Power input to antenna

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

5150~5250MHz

Max. output power including tune-up tolerancel:	12.64	(dBm)
Max. output power including tune-up tolerancel:	18.365383	(mW)
Duty cycle:	96.17	(%)
Maximum Pav :	17.661989	(mW)
Peak Antenna gain (Maximum):	5.27	(dBi)
Peak Antenna gain (linear):	3.3651157	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.012	(mW/cm2)

Measurement Result
The predicted power density level at 20 cm is 0.012 mW/cm2.
This is below the uncontrolled exposure limit of 1 mW/cm2 at 5180MHz.

5250~5350MHz

Max. output power including tune-up tolerancel:	12.65	(dBm)
Max. output power including tune-up tolerancel:	18.40772	(mW)
Duty cycle:	96.17	(%)
Maximum Pav :	17.702704	(mW)
Peak Antenna gain (Maximum):	5.27	(dBi)
Peak Antenna gain (linear):	3.3651157	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5320	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.012	(mW/cm2)

Measurement Result
The predicted power density level at 20 cm is 0.012 mW/cm2.
This is below the uncontrolled exposure limit of 1 mW/cm2 at 5320MHz.

5470~5725MHz

Max. output power including tune-up tolerancel:	12.55	(dBm)
Max. output power including tune-up tolerancel:	17.988709	(mW)
Duty cycle:	96.17	(%)
Maximum Pav :	17.299742	(mW)
Peak Antenna gain (Maximum):	5.27	(dBi)
Peak Antenna gain (linear):	3.3651157	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5500	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.012	(mW/cm2)

Measurement Result
The predicted power density level at 20 cm is 0.012 mW/cm2.
This is below the uncontrolled exposure limit of 1 mW/cm2 at 5500MHz.

5745~5825MHz

Max. output power including tune-up tolerancel:	12.58	(dBm)
Max. output power including tune-up tolerancel:	18.113401	(mW)
Duty cycle:	96.17	(%)
Maximum Pav :	17.419658	(mW)
Peak Antenna gain (Maximum):	5.27	(dBi)
Peak Antenna gain (linear):	3.3651157	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5785	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.012	(mW/cm2)

Measurement Result
The predicted power density level at 20 cm is 0.012 mW/cm2.
This is below the uncontrolled exposure limit of 1 mW/cm2 at 5785MHz.