16 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

16.1 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

MPE Prediction (802.11a (Main))

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

16.2 MAXIMUM PERMISSIBLE EXPOSURE (MPE) EVALUATION:

802.11a (Main)

Average Power Output (dBn

Frequency (MHz)	Reading Power (dBm)	Output Power (W)	Limit (W)
5180.00	10.59	0.01146	1
5220.00	10.77	0.01194	1
5240.00	**10.80**	0.01202	1

MPE PREDICTION

Maximum average output power at antenna input	10.8	(dBm)
Maximum average output power at antenna input	12.02264435	(mW)
Duty cycle:	100	(%)
Maximum Pav :	12.02264435	(mW)
Antenna gain (typical):	5.31	(dBi)
Maximum antenna gain:	3.396252726	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5240	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0081274	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0081274 W/cm^2. This is below the uncontrolled

exposure limit of 1 mW/cm2 at 5240MHz.

802.11n (5GHz)_20M MIMO Chain 0+ Chain1

Average Power Output (dBn

Frequency (MHz)	Reading Power (dBm)	Output Power (W)	Limit (W)
5180.00	13.51	0.02244	1
5220.00	13.84	0.02421	1
5240.00	**13.86**	0.02432	1

MPE PREDICTION

Maximum average output power at antenna input	13.86	(dBm)
Maximum average output power at antenna input	24.32204009	(mW)
Duty cycle:	100	(%)
Maximum Pav :	24.32204009	(mW)
Antenna gain (typical):	9.26	(dBi)
Maximum antenna gain:	8.433347578	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5240	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0408273	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0408273 W/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5240MHz.

802.11n (5GHz)_40M MIMO Chain 0+Chain 1

Average Power Output (dBn

Frequency (MHz)	Reading Power (dBm)	Output Power (W)	Limit (W)
5190.00	12.24	0.01675	1
5230.00	**12.48**	0.01770	1

MPE PREDICTION

Maximum average output power at antenna input	12.48	(dBm)
Maximum average output power at antenna input	17.70108958	(mW)
Duty cycle:	100	(%)
Maximum Pav :	17.70108958	(mW)
Antenna gain (typical):	9.26	(dBi)
Maximum antenna gain:	8.433347578	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5230	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0297133	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0297133 W/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5230MHz.