1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 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

1.2 Maximum Permissible Exposure (MPE) Evaluation

802.11b Main								
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
1	2412	1	**24.6**	**288.40**	1 Watt =	30.00	dBm	PASS
6	2437	1	24.2	263.03	1 Watt =	30.00	dBm	PASS
11	2462	1	22.9	194.98	1 Watt =	30.00	dBm	PASS

MPE Prediction (802.11b 2412~2462)

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

Max. output power including tune-up tolerancel:	24.60	(dBm)
Max. output power including tune-up tolerancel:	288.40315	(mW)
Duty cycle:	100	(%)
Maximum Pav :	288.40315	(mW)
Peak Antenna gain (Maximum):	5.05	(dBi)
Peak Antenna gain (linear):	3.1988951	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.184	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.184 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2412MHz.

1.3 Maximum Permissible Exposure (MPE) Evaluation

802.11g Main								
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
1	2412	6	19.75	94.41	1 Watt =	30.00	dBm	PASS
6	2437	6	**19.95**	**98.86**	1 Watt =	30.00	dBm	PASS
11	2462	6	19.5	89.13	1 Watt =	30.00	dBm	PASS

MPE Prediction (802.11g 2412~2462)

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

Max. output power including tune-up tolerancel:	19.95	(dBm)
Max. output power including tune-up tolerancel:	98.855309	(mW)
Duty cycle:	100	(%)
Maximum Pav :	98.855309	(mW)
Peak Antenna gain (Maximum):	5.05	(dBi)
Peak Antenna gain (linear):	3.1988951	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.063	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.063 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2437MHz.

1.4 Maximum Permissible Exposure (MPE) Evaluation

802.11n_HT20M Main								
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
1	2412	MCS0	17.7	58.88	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	18.15	65.31	1 Watt =	30.00	dBm	PASS
11	2462	MCS0	**18.35**	**68.39**	1 Watt =	30.00	dBm	PASS

MPE Prediction (802.11n20 2412~2462)

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

Max. output power including tune-up tolerance:	18.35	(dBm)
Max. output power including tune-up tolerancel:	68.391165	(mW)
Duty cycle:	100	(%)
Maximum Pav :	68.391165	(mW)
Peak Antenna gain (Maximum):	5.05	(dBi)
Peak Antenna gain (linear):	3.1988951	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.044	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.044 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2462MHz.

1.5 Maximum Permissible Exposure (MPE) Evaluation

802.11n_HT40M Main								
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
3	2422	MCS0	16.75	47.32	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	18.01	63.24	1 Watt =	30.00	dBm	PASS
9	2452	MCS0	**18.1**	**64.57**	1 Watt =	30.00	dBm	PASS

MPE Prediction (802.11n40 2422~2452)

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

Max. output power including tune-up tolerancel:	18.10	(dBm)
Max. output power including tune-up tolerancel:	64.565423	(mW)
Duty cycle:	100	(%)
Maximum Pav :	64.565423	(mW)
Peak Antenna gain (Maximum):	5.05	(dBi)
Peak Antenna gain (linear):	3.1988951	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2452	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.041	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.041 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2452MHz.