

### 13 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

#### 13.1 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 §2.1091 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 <sup>2</sup> )	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 <sup>2</sup> )	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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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### 13.2 Maximum Permissible Exposure (MPE) Evaluation

#### 802.11b Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (W)
2412.00	19.09	0.081096
2437.00	<b>19.14</b>	0.082035
2462.00	18.83	0.076384

#### MPE Prediction (802.11b)

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

Maximum peak output power at antenna input terminal:	19.14	(dBm)
Maximum peak output power at antenna input terminal:	82.03515443	(mW)
Duty cycle:	99	(%)
Maximum Pav :	81.21480289	(mW)
Antenna gain (typical):	2.15	(dBi)
Maximum antenna gain:	1.640589773	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.026521	(mW/cm <sup>2</sup> )

#### Measurement Result

The predicted power density level at 20 cm is 0.026521 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2437MHz.

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**802.11g Power Table**

Frequency (MHz)	Reading Power (dBm)	Output Power (W)
2412.00	<b>23.27</b>	0.212324
2437.00	23.19	0.208449
2462.00	23.02	0.200447

**MPE Prediction (802.11g)**

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

Maximum peak output power at antenna input terminal:	<b>23.27</b>	(dBm)
Maximum peak output power at antenna input terminal:	212.3244462	(mW)
Duty cycle:	<b>97</b>	(%)
Maximum Pav :	205.9547128	(mW)
Antenna gain (typical):	<b>2.15</b>	(dBi)
Maximum antenna gain:	1.640589773	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>2412</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.067255	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.067255 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2412.

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802.11n\_20M Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (W)
2412.00	23.10	0.204174
2437.00	<b>23.18</b>	0.207970
2462.00	22.95	0.197242

MPE Prediction (802.11n\_20M)

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

Maximum peak output power at antenna input terminal:	23.18	(dBm)
Maximum peak output power at antenna input terminal:	207.9696687	(mW)
Duty cycle:	96	(%)
Maximum Pav :	199.650882	(mW)
Antenna gain (typical):	2.15	(dBi)
Maximum antenna gain:	1.640589773	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.065196	(mW/cm <sup>2</sup> )

Measurement Result

The predicted power density level at 20 cm is 0.065196 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2437.

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