



## Maximum Permissible Exposure (MPE)

### 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 <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

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## Maximum Permissible Exposure (MPE) Evaluation

### 802.11b Power Table

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	<b>16.96</b>	0.00	<b>16.96</b>	0.04966	1
2437.00	16.82	0.00	16.82	0.04808	1
2462.00	16.74	0.00	16.74	0.04721	1

### 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:	<b>16.96</b>	(dBm)
Maximum peak output power at antenna input terminal:	49.65923215	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	49.65923215	(mW)
Antenna gain (typical):	<b>5</b>	(dBi)
Maximum antenna gain:	3.16227766	(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)	0.0312572	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.3125722	(W/m <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0313 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2412MHz.

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### 802.11g Power Table

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	16.33	0.00	16.33	0.04295	1
2437.00	16.30	0.00	16.30	0.04266	1
2462.00	<b>16.37</b>	0.00	<b>16.37</b>	0.04335	1

### 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>16.37</b>	(dBm)
Maximum peak output power at antenna input terminal:	43.35108784	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	43.35108784	(mW)
Antenna gain (typical):	<b>5</b>	(dBi)
Maximum antenna gain:	3.16227766	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>2462</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0272867	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0273 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2462.

*Remark: For Co-located MPE please reference to Report No.: EH/2012/70043 from page 227-248.*

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