

## 1. 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

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5180	<b>16.70</b>	0.047	0.25
5220	16.47	0.044	0.25
5240	15.75	0.038	0.25

### MPE Prediction (802.11a 5180~5240)

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>16.70</b>	(dBm)
Maximum peak output power at antenna input terminal:	46.77351413	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	46.77351413	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5180</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0147554	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0147554 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5180MHz.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5745	13.87	0.024	1
5785	<b>14.16</b>	0.026	1
5825	13.42	0.022	1

### MPE Prediction (802.11a 5745~5825)

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>14.16</b>	(dBm)
Maximum peak output power at antenna input terminal:	26.0615355	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	26.0615355	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5785</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0082215	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0082215 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5785MHz.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5180	<b>17.56</b>	0.057	0.25
5220	16.46	0.044	0.25
5240	16.57	0.045	0.25

### MPE Prediction (802.11n-HT20 5180~5240)

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>17.56</b>	(dBm)
Maximum peak output power at antenna input terminal:	57.01642723	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	57.01642723	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5180</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0179867	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0179867 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5180MHz.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5745	<b>16.34</b>	0.043	1
5785	16.09	0.041	1
5825	15.25	0.033	1

### MPE Prediction (802.11 n-HT20 5745~5825)

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>16.34</b>	(dBm)
Maximum peak output power at antenna input terminal:	43.05266105	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	43.05266105	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5745</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0135816	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0135816 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5745MHz.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5190	<b>12.05</b>	0.016	0.25
5230	11.15	0.013	0.25

### MPE Prediction (802.11n-HT40 5190~5230)

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>12.05</b>	(dBm)
Maximum peak output power at antenna input terminal:	16.03245391	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	16.03245391	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5190</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0050577	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0050577 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5190MHz.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5755	14.64	0.029	1
5795	<b>16.92</b>	0.049	1

### MPE Prediction (802.11n-HT40 5745~5795)

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>16.92</b>	(dBm)
Maximum peak output power at antenna input terminal:	49.20395357	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	49.20395357	(mW)
Antenna gain (Maximum):	<b>2</b>	(dBi)
Antenna gain (linear):	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5795</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0155221	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.0155221 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5795MHz.

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