

# 1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

## 14.1 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

### 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

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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## 802.11a Max. Output Power

### 802.11a\_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	13.86	24.342	23.98	PASS
44	5220	6	<b>13.95</b>	24.851	23.98	PASS
48	5240	6	13.81	24.063	23.98	PASS

### MPE Prediction (802.11a 5150~5250MHz)

Average output power at antenna input terminal:	<b>13.95</b>	(dBm)
Average output power at antenna input terminal:	24.831331	(mW)
Duty cycle:	<b>93.25</b>	(%)
Maximum Pav :	23.155216	(mW)
Peak Antenna gain (Maximum):	<b>4.5</b>	(dBi)
Peak Antenna gain (linear):	2.8183829	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5220</b>	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm) distance:	0.013	(mW/cm <sup>2</sup> )

#### Measurement Result

The predicted power density level at 20 cm is 0.013 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5220MHz.

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## 802.11n\_HT20 Max. Output Power

### 802.11n\_HT20\_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	12.88	19.406	23.98	PASS
44	5220	MCS0	<b>12.96</b>	19.767	23.98	PASS
48	5240	MCS0	12.83	19.184	23.98	PASS

## MPE Prediction (802.11n\_HT20 5150~5250MHz)

Average output power at antenna input terminal:	<b>12.96</b>	(dBm)
Average output power at antenna input terminal:	19.769696	(mW)
Duty cycle:	<b>92.91</b>	(%)
Maximum Pav :	18.368025	(mW)
Peak Antenna gain (Maximum):	<b>4.5</b>	(dBi)
Peak Antenna gain (linear):	2.8183829	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5220</b>	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm) distance	0.010	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5220MHz.

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## 802.11n\_HT40 Max. Output Power

### 802.11n\_HT40\_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	11.94	15.645	23.98	PASS
46	5230	MCS0	11.90	15.502	23.98	PASS

## MPE Prediction (802.11n\_HT40 5150~5250MHz)

Average output power at antenna input terminal:	11.94	(dBm)
Average output power at antenna input terminal:	15.631476	(mW)
Duty cycle:	86.82	(%)
Maximum Pav :	13.571248	(mW)
Peak Antenna gain (Maximum):	4.5	(dBi)
Peak Antenna gain (linear):	2.8183829	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5190	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm) distance	0.008	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.008 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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