

14 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 §2.1093 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

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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14.2 Maximum Permissible Exposure (MPE) Evaluation

802.11a Power Table

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5180	9.68	0.00929	1
5220	9.18	0.00828	1
5240	8.85	0.00767	1
5745	9.08	0.00809	1
5785	8.58	0.00721	1
5825	7.83	0.00607	1

MPE Prediction (802.11a)

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:	9.68	(dBm)
Maximum peak output power at antenna input terminal:	9.289663868	(mW)
Duty cycle:	99	(%)
Maximum Pav :	9.196767229	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0029013	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.0029013mW/cm². This is below the uncontrolled exposure limit of 1mW/cm² at 5180MHz.

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802.11n HT20 Power Table

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5180	10.43	0.01104	1
5220	9.10	0.00813	1
5240	9.55	0.00902	1
5745	8.58	0.00721	1
5785	9.03	0.00800	1
5825	7.89	0.00615	1

MPE Prediction (802.11n_HT20)

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:	10.43	(dBm)
Maximum peak output power at antenna input terminal:	11.0407862	(mW)
Duty cycle:	99	(%)
Maximum Pav :	10.93037834	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0034481	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.0034481mW/cm². This is below the uncontrolled exposure limit of 1mW/cm² at 5180MHz.

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802.11n HT40 Power Table

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
5190	8.55	0.00716	1
5230	8.07	0.00641	1
5755	8.41	0.00693	1
5795	9.06	0.00805	1

MPE Prediction (802.11n_HT40)

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:	9.06	(dBm)
Maximum peak output power at antenna input terminal:	8.053784412	(mW)
Duty cycle:	99	(%)
Maximum Pav :	7.973246568	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5795	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0025153	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.0025153mW/cm². This is below the uncontrolled exposure limit of 1mW/cm² at 5795MHz.

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