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^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

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Maximum Permissible Exposure (MPE) Evaluation

802.11a operation Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5180	**17.12**	**17.12**	0.05152
5220	16.91	16.91	0.04909
5240	17.02	17.02	0.05035

MPE Prediction (802.11a 5150~5250)

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:	17.12	(dBm)
Maximum peak output power at antenna input terminal:	51.52286446	(mW)
Duty cycle:	96.94	(%)
Maximum Pav :	49.94626481	(mW)
Antenna gain (Maximum):	6.69	(dBi)
Antenna gain (linear):	4.666593803	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0018557	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00186mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5180MHz.

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802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5180	17.02	17.02	0.05035
5220	**17.06**	**17.06**	0.05082
5240	17.04	17.04	0.05058

MPE Prediction (802.11n_HT20 5150~5250)

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:	17.06	(dBm)
Maximum peak output power at antenna input terminal:	50.81594426	(mW)
Duty cycle:	93.62	(%)
Maximum Pav :	47.57388701	(mW)
Antenna gain (Maximum):	6.69	(dBi)
Antenna gain (linear):	4.666593803	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5220	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0017676	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00177mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5220MHz.

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802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5190	**17.42**	**17.42**	0.05521
5230	17.29	17.29	0.05358

MPE Prediction (802.11n_HT40 5150~5250)

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:	17.42	(dBm)
Maximum peak output power at antenna input terminal:	55.20774393	(mW)
Duty cycle:	91.01	(%)
Maximum Pav :	50.24456775	(mW)
Antenna gain (Maximum):	6.69	(dBi)
Antenna gain (linear):	4.666593803	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5190	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0018668	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00187mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5190MHz.

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802.11a operation Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5745	11.89	11.89	0.01545
5785	12.33	12.33	0.01710
5825	**12.68**	**12.68**	0.01854

MPE Prediction (802.11a 5725~5850)

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:	12.68	(dBm)
Maximum peak output power at antenna input terminal:	18.53531623	(mW)
Duty cycle:	96.94	(%)
Maximum Pav :	17.96813556	(mW)
Antenna gain (Maximum):	7.8	(dBi)
Antenna gain (linear):	6.025595861	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5825	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0008620	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00086mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5825MHz.

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802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5745	**18.29**	**18.29**	0.06745
5785	17.87	17.87	0.06124
5825	17.90	17.90	0.06166

MPE Prediction (802.11n_HT20 5725~5850)

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:	18.29	(dBm)
Maximum peak output power at antenna input terminal:	67.45280277	(mW)
Duty cycle:	93.62	(%)
Maximum Pav :	63.14931395	(mW)
Antenna gain (Maximum):	7.8	(dBi)
Antenna gain (linear):	6.025595861	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5745	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0030296	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00303mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5745MHz.

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802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)
5755	17.05	17.05	0.05070
5795	**17.79**	**17.79**	0.06012

MPE Prediction (802.11n_HT40 5755~5795)

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:	17.79	(dBm)
Maximum peak output power at antenna input terminal:	60.11737375	(mW)
Duty cycle:	91.01	(%)
Maximum Pav :	54.71282185	(mW)
Antenna gain (Maximum):	7.8	(dBi)
Antenna gain (linear):	6.025595861	(numeric)
Prediction distance:	100	(cm)
Prediction frequency:	5795	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 100 (cm)	0.0026248	(mW/cm^2)

Measurement Result

The predicted power density level at 100 cm is 0.00262mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5795MHz.

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