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

MAXIMUM PERMISSIBLE EXPOSURE (MPE) EVALUATION

802.11a 5150~5250 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	**10.77**	**10.77**	0.01194	1
5220.00	10.41	10.41	0.01099	1
5240.00	10.38	10.38	0.01091	1

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:	10.77	(dBm)
Maximum peak output power at antenna input terminal:	11.93988104	(mW)
Duty cycle:	100	(%)
Maximum Pav :	11.93988104	(mW)
Antenna gain (typical):	4.9	(dBi)
Maximum antenna gain:	3.090295433	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0073443	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00734 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5180MHz.

802.11a 5250~5350 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	10.49	10.49	0.01119	1
5300.00	**10.50**	**10.50**	0.01122	1
5320.00	10.33	10.33	0.01079	1

MPE Prediction (802.11a 5250~5350)

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:	10.5	(dBm)
Maximum peak output power at antenna input terminal:	11.22018454	(mW)
Duty cycle:	100	(%)
Maximum Pav :	11.22018454	(mW)
Antenna gain (typical):	4.83	(dBi)
Maximum antenna gain:	3.040885026	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5300	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0067913	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00679 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5300MHz.

802.11a 5470~5725 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	**10.36**	**10.36**	0.01086	1
5580.00	10.24	10.24	0.01057	1
5700.00	10.21	10.21	0.01050	1

MPE Prediction (802.11a 5470~5725)

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:	10.36	(dBm)
Maximum peak output power at antenna input terminal:	10.86425624	(mW)
Duty cycle:	100	(%)
Maximum Pav :	10.86425624	(mW)
Antenna gain (typical):	4.52	(dBi)
Maximum antenna gain:	2.831391996	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5500	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0061228	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00612 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5500MHz.

802.11n HT20 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	**10.71**	**10.71**	0.01178	1
5220.00	10.36	10.36	0.01086	1
5240.00	10.31	10.31	0.01074	1

MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 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:	10.71	(dBm)
Maximum peak output power at antenna input terminal:	11.77605974	(mW)
Duty cycle:	100	(%)
Maximum Pav :	11.77605974	(mW)
Antenna gain (typical):	4.9	(dBi)
Maximum antenna gain:	3.090295433	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0072435	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00724 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5180MHz.

802.11n HT20 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	**10.53**	**10.53**	0.01130	1
5300.00	10.46	10.46	0.01112	1
5320.00	10.32	10.32	0.01076	1

MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5250~5350)

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:	10.53	(dBm)
Maximum peak output power at antenna input terminal:	11.29795915	(mW)
Duty cycle:	100	(%)
Maximum Pav :	11.29795915	(mW)
Antenna gain (typical):	4.83	(dBi)
Maximum antenna gain:	3.040885026	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5260	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0068383	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00684 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5260MHz.

802.11n HT20 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	10.10	10.10	0.01023	1
5580.00	10.11	10.11	0.01026	1
5700.00	**10.24**	**10.24**	0.01057	1

MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5470~5725)

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:	10.24	(dBm)
Maximum peak output power at antenna input terminal:	10.56817509	(mW)
Duty cycle:	100	(%)
Maximum Pav :	10.56817509	(mW)
Antenna gain (typical):	4.52	(dBi)
Maximum antenna gain:	2.831391996	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0059559	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00596 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5700MHz.