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 §2.1091 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^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

2.4GHz mode:

The worst case: refer to FCC test report for detail measurement date.

Power measurement:

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
Low	-2.71	0.00054	0.125
Mid	-2.62	0.00055	0.125
High	-3.13	0.00049	0.125

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 output power at antenna input terminal:	-2.62	(dBm)
Maximum output power at antenna input terminal:	0.547015963	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	0.688652296	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0002735	(mW/cm^2)

Measurement Result:

The predicted power density level at 20 cm is 0.0002735 mW/cm^2.. This is below the uncontrolled exposure limit of 1 mW/cm^2.

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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
Low	4.50	0.00282	1
Mid	5.27	0.00336	1
High	4.89	0.00308	1

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 output power at antenna input terminal:	5.27	(dBm)
Maximum output power at antenna input terminal:	3.365115694	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	4.23642966	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0016825	(mW/cm^2)

Measurement Result:

The predicted power density level at 20 cm is 0.0016825 mW/cm^2.. This is below the uncontrolled exposure limit of 1 mW/cm^2.

802.11g

Cable loss = 0	Output Power		Limit (dBm)
CH	Detector		
	PK (dBm)	AV (dBm)	
Low	25.03	17.22	30.00
Mid	25.13	17.18	
High	25.25	17.14	

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 output power at antenna input terminal:	25.25	(dBm)
Maximum output power at antenna input terminal:	334.9654392	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	421.6965034	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.1674751	(mW/cm^2)

Measurement Result:

The predicted power density level at 20 cm is 0.1496065 mW/cm^2.. This is below the uncontrolled exposure limit of 1 mW/cm^2..

5150MHz – 5350MHz Mode:

The worst case of Average power a mode: refer to FCC test report for detail measurement date.

Power measurement:

802.11a

Mode	Channel	power (dBm)	limit(dBm)	result
802.11a	5180	12.35	29.37	pass
	5260	12.32	23.34	pass
	5320	12.18	23.34	pass

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 output power at antenna input terminal:	12.35	(dBm)
Maximum output power at antenna input terminal:	17.17908387	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	21.62718524	(mW)
Antenna gain (typical):	4.5	(dBi)
Maximum antenna gain:	2.818382931	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0121325	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0121325 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

5470MHz – 5725MHz Mode:

The worst case of Average power a mode: refer to FCC test report for detail measurement date.

Power measurement:

802.11a

Mode	Channel	power (dBm)	limit(dBm)	result
802.11a	5500	11.76	23.34	pass
	5600	12.03	23.34	pass
	5700	11.83	23.34	pass

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 output power at antenna input terminal:	12.03	(dBm)
Maximum output power at antenna input terminal:	15.95879147	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	20.09092813	(mW)
Antenna gain (typical):	4.5	(dBi)
Maximum antenna gain:	2.818382931	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0112707	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0112707mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

5725MHz – 5850MHz Mode:

The worst case of Average power a mode: refer to FCC test report for detail measurement date.

Power measurement:

802.11a

Mode	Channel	power (dBm)	limit(dBm)	result
802.11a	5745	11.34	29.37	pass
	5785	11.20	29.37	pass
	5825	11.12	29.37	pass

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 output power at antenna input terminal:	11.34	(dBm)
Maximum output power at antenna input terminal:	13.61444682	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	17.13957308	(mW)
Antenna gain (typical):	4.5	(dBi)
Maximum antenna gain:	2.818382931	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0096150	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0096150mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Simultaneous transmission mode

2.4GHz mode + (5150MHz – 5250MHz) Mode:

Prediction frequency:	2.4	(GHz)
Power density at predication frequency at 20 (cm)	0.1674751	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0121325	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.1796076	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.1796076mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Simultaneous transmission mode

2.4GHz mode + (5725MHz – 5850MHz) Mode:

Prediction frequency:	2.4	(GHz)
Power density at predication frequency at 20 (cm)	0.1674751	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0112707	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.1787458	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.1787458mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Simultaneous transmission mode

2.4GHz mode + (5470MHz – 5725MHz) Mode:

Prediction frequency:	2.4	(GHz)
Power density at predication frequency at 20 (cm)	0.1674751	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0096150	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.1770901	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.1770901mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

~ End of Report ~