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 of Average power: refer to FCC test report for detail measurement date.

Power measurement:

802.11b

Cable loss = 0	Output Power		Limit (dBm)
CH	Detector		
	PK (dBm)	AV (dBm)	
Low	16.57	14.05	30.00
Mid	16.26	13.74	
High	16.23	13.71	

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:	16.67	(dBm)
Maximum output power at antenna input terminal:	46.45152752	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	58.47900841	(mW)
Antenna gain (typical):	2.91	(dBi)
Maximum antenna gain:	1.954339456	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0227484	(mW/cm^2)

Measurement Result:

The predicted power density level at 20 cm is 0.0227484 mW/cm^2.. This is below the uncontrolled exposure limit of 1 mW/cm^2.

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5150MHz – 5250MHz Mode:

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

Power measurement:

Mode	Freq(MHz)	channel	power (dBm)	limit(dBm)	result
802.11a	5180	36	15.44	23.97	pass
	5200	40	15.52	23.97	pass
	5240	48	15.76	23.97	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:	15.76	(dBm)
Maximum output power at antenna input terminal:	37.6703799	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	47.42419853	(mW)
Antenna gain (typical):	3.07	(dBi)
Maximum antenna gain:	2.02768272	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0191404	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0191404 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

5180MHz – 5320Mode:

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

Power measurement:

802.11a

Channel	power (dBm)	limit(dBm)	result
5180	15.44	23.97	pass
5260	15.52	23.97	pass
5320	15.76	23.97	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:	15.76	(dBm)
Maximum output power at antenna input terminal:	37.6703799	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	47.42419853	(mW)
Antenna gain (typical):	3.22	(dBi)
Maximum antenna gain:	2.098939884	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0198130	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0198130mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

5470MHz – 5725Mode:

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

Power measurement:

802.11a

Channel	power (dBm)	limit(dBm)	result
5500	15.45	23.97	pass
5580	15.49	23.97	pass
5700	15.65	23.97	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:	15.65	(dBm)
Maximum output power at antenna input terminal:	36.72823005	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	46.23810214	(mW)
Antenna gain (typical):	3.22	(dBi)
Maximum antenna gain:	2.098939884	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0193175	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0193175mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

5725MHz – 5850Mode:

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

Power measurement:

802.11a

Channel	power (dBm)	limit(dBm)	result
5745	15.37	30	pass
5785	15.44	30	pass
5825	15.53	30	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:	15.53	(dBm)
Maximum output power at antenna input terminal:	35.72728382	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	44.97798549	(mW)
Antenna gain (typical):	3.22	(dBi)
Maximum antenna gain:	2.098939884	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0187910	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0187910mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Simultaneous transmission mode

2.4GHz mode + (5150MHz – 5350MHz) Mode:

Prediction frequency:	2.4	(GHz)
Power density at predication frequency at 20 (cm)	0.0227484	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0191404	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.0418888	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.0418888mW/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)	0.0227484	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0198130	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.0425614	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.0425614 mW/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)	0.0227484	(mW/cm^2)

Prediction frequency:	5	(GHz)
Power density at predication frequency at 20 (cm)	0.0193175	(mW/cm^2)
2.4GHz + 5GHz Power density at predication frequency at 20 (cm) distance	0.0420659	(mW/cm^2)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)

The predicted power density level at 20 cm is 0.0420659 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

~ End of Report ~