

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

802.11b Main						
CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
1	2412	1	17.73	59.29	1 Watt = 30.00 dBm	PASS
6	2437	1	17.83	60.67	1 Watt = 30.00 dBm	PASS
11	2462	1	17.92	61.94	1 Watt = 30.00 dBm	PASS
802.11b Main						
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT
1	2412	1	14.72	29.65	1 Watt = 30.00 dBm	PASS
6	2437	1	14.76	29.92	1 Watt = 30.00 dBm	PASS
11	2462	1	14.79	30.13	1 Watt = 30.00 dBm	PASS

MPE Prediction (802.11b 2412~2462)

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

Max. output power including tune-up tolerancel:	14.79	(dBm)
Max. output power including tune-up tolerancel:	30.13006	(mW)
Duty cycle:	98.61	(%)
Maximum Pav :	29.711252	(mW)
Peak Antenna gain (Maximum):	-4.14	(dBi)
Peak Antenna gain (linear):	0.3854784	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.002	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.002 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 2462MHz.

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802.11g Main						
CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
1	2412	6	21.69	147.57	1 Watt = 30.00 dBm	PASS
6	2437	6	21.56	143.22	1 Watt = 30.00 dBm	PASS
11	2462	6	21.47	140.28	1 Watt = 30.00 dBm	PASS

802.11g Main						
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT
1	2412	6	13.76	23.77	1 Watt = 30.00 dBm	PASS
6	2437	6	13.70	23.44	1 Watt = 30.00 dBm	PASS
11	2462	6	13.09	20.37	1 Watt = 30.00 dBm	PASS

MPE Prediction (802.11g 2412~2462)

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

Max. output power including tune-up tolerancel:	13.76	(dBm)
Max. output power including tune-up tolerancel:	23.768403	(mW)
Duty cycle:	92.9	(%)
Maximum Pav :	22.080846	(mW)
Peak Antenna gain (Maximum):	-4.14	(dBi)
Peak Antenna gain (linear):	0.3854784	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.002	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.002 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

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802.11n_HT20M Main						
CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
1	2412	MCS0	21.58	143.88	1 Watt = 30.00 dBm	PASS
6	2437	MCS0	20.78	119.67	1 Watt = 30.00 dBm	PASS
11	2462	MCS0	20.84	121.34	1 Watt = 30.00 dBm	PASS
802.11n_HT20M Main						
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT
1	2412	MCS0	13.75	23.71	1 Watt = 30.00 dBm	PASS
6	2437	MCS0	13.72	23.55	1 Watt = 30.00 dBm	PASS
11	2462	MCS0	12.89	19.45	1 Watt = 30.00 dBm	PASS

MPE Prediction (802.11n_HT20 2412~2462)

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

Max. output power including tune-up tolerancel:	13.75	(dBm)
Max. output power including tune-up tolerancel:	23.713737	(mW)
Duty cycle:	92.15	(%)
Maximum Pav :	21.852209	(mW)
Peak Antenna gain (Maximum):	-4.14	(dBi)
Peak Antenna gain (linear):	0.3854784	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.002	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.002 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

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802.11n_HT40M Main						
CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
3	2422	MCS0	21.05	127.35	1 Watt = 30.00 dBm	PASS
6	2437	MCS0	21.21	132.13	1 Watt = 30.00 dBm	PASS
9	2452	MCS0	21.11	129.12	1 Watt = 30.00 dBm	PASS
802.11n_HT40M Main						
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT
3	2422	MCS0	13.76	23.77	1 Watt = 30.00 dBm	PASS
6	2437	MCS0	13.74	23.66	1 Watt = 30.00 dBm	PASS
9	2452	MCS0	13.16	20.70	1 Watt = 30.00 dBm	PASS

MPE Prediction (802.11n_HT40 2422~2452)

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

Max. output power including tune-up tolerancel:	13.76	(dBm)
Max. output power including tune-up tolerancel:	23.768403	(mW)
Duty cycle:	85.68	(%)
Maximum Pav :	20.364768	(mW)
Peak Antenna gain (Maximum):	-4.14	(dBi)
Peak Antenna gain (linear):	0.3854784	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2422	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.002	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.002 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 2422MHz.

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