

1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Maximum Permissible Exposure (MPE) Evaluation (worst case)

802.11n_HT20M MIMO								
CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	MCS8	21.84	21.59	24.73	296.97	1 Watt = 29.08 dBm	PASS
6	2437	MCS8	21.64	23.11	25.45	350.53	1 Watt = 29.08 dBm	PASS
11	2462	MCS8	21.62	21.39	24.52	282.93	1 Watt = 29.08 dBm	PASS
802.11n_HT20M MIMO								
CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)		Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	MCS8	11.67	12.01	14.85	30.57	1 Watt = 29.08 dBm	PASS
6	2437	MCS8	11.55	12.25	14.92	31.08	1 Watt = 29.08 dBm	PASS
11	2462	MCS8	10.53	11.23	13.90	24.57	1 Watt = 29.08 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

$$\text{MIMO gain} = G + (10 \log N) = 3.91 + 3.01 = 6.92 \text{ dBm}$$

Max. output power including tune-up tolerancel:	14.92	(dBm)
Max. output power including tune-up tolerancel:	31.045596	(mW)
Duty cycle:	90.87	(%)
Maximum Pav :	28.211133	(mW)
Peak Antenna gain (Maximum):	6.92	(dBi)
Peak Antenna gain (linear):	4.9203954	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.028	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.028 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 2437MHz.

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