



## **RF Exposure Compliance Requirement**

### **1. Standard requirement**

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

#### **(a) Limits for Occupational / Controlled Exposure**

<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (E) (V/m)</b>	<b>Magnetic Field Strength (H) (A/m)</b>	<b>Power Density (S)(mW/cm<sup>2</sup>)</b>	<b>Averaging Times  E <sup>2</sup>,  H <sup>2</sup> or S (minutes)</b>
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	F/300	6
1500-100000	--	--	5	6

#### **(b) Limits for General Population / Uncontrolled Exposure**

<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (E) (V/m)</b>	<b>Magnetic Field Strength (H) (A/m)</b>	<b>Power Density (S)(mW/cm<sup>2</sup>)</b>	<b>Averaging Times  E <sup>2</sup>,  H <sup>2</sup> or S (minutes)</b>
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	F/1500	30
1500-100000	--	--	1.0	30

Note: f=frequency in MHz; \*Plane-wave equivalent power density



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### 2. MPE Calculation Method

$$E (V/m) = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } Pd(W/m^2) = E^2 / 377$$

E=Electric Field (V/m)

P=Peak RF output Power (W)

G=EUT Antenna numeric gain (numeric)

d= Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance,  $d=0.2m$ , as well as the gain of the used antenna, the RF power density can be obtained.

### 3. Calculated Result and Limit

(1) 802.11b 11Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	1.0	17.48	55.976	0.01114	1	Pass
2442	1.0	15.44	34.995	0.00696	1	Pass
2462	1.0	13.97	24.946	0.00496	1	Pass

(2) 802.11g 54Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	1.0	21.4	138.038	0.02746	1	Pass
2442	1.0	19.63	91.833	0.01827	1	Pass
2462	1.0	18.09	64.417	0.01282	1	Pass



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3) 802.11n HT20 65Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	1.0	21.8	151.356	0.03011	1	Pass
2442	1.0	19.94	98.628	0.01962	1	Pass
2462	1.0	18.41	69.343	0.01379	1	Pass

3) 802.11n HT40 135Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2422	1.0	19.32	85.507	0.01701	1	Pass
2442	1.0	18.71	74.302	0.01478	1	Pass
2452	1.0	17.77	59.841	0.01190	1	Pass