



## 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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm <sup>2</sup> )	Averaging Times $ E ^2,  H ^2$ or S (minutes)
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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm <sup>2</sup> )	Averaging Times $ E ^2,  H ^2$ or S (minutes)
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

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

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

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

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

### 3. Calculated Result and Limit

For BT

Normal mode

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
2402	0.631	3.1	2.042	0.00026	1	Complies
2441	0.631	2.82	1.914	0.00024	1	Complies
2480	0.631	3.1	2.042	0.00026	1	Complies

EDR mode

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
2402	0.631	1.94	1.563	0.00020	1	Complies
2441	0.631	1.41	1.384	0.00017	1	Complies
2480	0.631	1.57	1.435	0.00018	1	Complies



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**For Wi-Fi**

**(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	0.631	17.18	52.240	0.00656	1	Complies
2442	0.631	15.76	37.670	0.00473	1	Complies
2462	0.631	15.44	34.995	0.00439	1	Complies

**(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	0.631	19.16	82.414	0.01034	1	Complies
2442	0.631	18.24	66.681	0.00837	1	Complies
2462	0.631	17.24	52.966	0.00665	1	Complies

**(3) 802.11n(HT20) 72.2Mbps 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	0.631	19.48	88.716	0.01114	1	Complies
2442	0.631	18.24	66.681	0.00837	1	Complies
2462	0.631	17.99	62.951	0.00790	1	Complies

**(4) 802.11n(HT40) 150Mbps 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	0.631	16.79	47.753	0.00599	1	Complies
2442	0.631	16.24	42.073	0.00528	1	Complies
2452	0.631	15.87	38.637	0.00485	1	Complies



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**For Wi-Fi+ BT Normal**

(1)

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
0.631	20.28	106.660	0.01339	1	Complies
0.631	18.58	72.111	0.00905	1	Complies
0.631	18.54	71.450	0.00897	1	Complies

(2)

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
0.631	22.26	168.267	0.02112	1	Complies
0.631	21.06	127.644	0.01602	1	Complies
0.631	20.34	108.143	0.01357	1	Complies

(3)

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
0.631	22.58	181.134	0.02274	1	Complies
0.631	21.06	127.644	0.01602	1	Complies
0.631	21.09	128.529	0.01613	1	Complies

(4) 802.11n(HT40) 150Mbps data rate

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
0.631	18.73	74.645	0.00937	1	Complies
0.631	17.65	58.210	0.00731	1	Complies
0.631	17.44	55.463	0.00696	1	Complies



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**For Wi-Fi+ BT EDR**

(1)

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
0.631	19.12	81.658	0.01025	1	Complies
0.631	17.17	52.119	0.00654	1	Complies
0.631	17.01	50.234	0.00631	1	Complies

(2)

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
0.631	21.1	128.825	0.01617	1	Complies
0.631	19.65	92.257	0.01158	1	Complies
0.631	18.81	76.033	0.00954	1	Complies

(3)

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
0.631	21.42	138.676	0.01741	1	Complies
0.631	19.65	92.257	0.01158	1	Complies
0.631	19.56	90.365	0.01134	1	Complies

(4)

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
0.631	17.22	52.723	0.00662	1	Complies
0.631	16.25	42.170	0.00529	1	Complies
0.631	15.90	38.905	0.00488	1	Complies