



## 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  <sup>2</sup> ,  H  <sup>2</sup> 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  <sup>2</sup> ,  H  <sup>2</sup> 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



## 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                    | 22.93                   | 196.336                | 0.03906                                 | 1  | Pass        |
| 2442            | 1.0                    | 22.75                   | 188.365                | 0.03747                                 | 1  | Pass        |
| 2462            | 1.0                    | 24.33                   | 271.019                | 0.05392                                 | 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                    | 20.46                   | 111.173                | 0.02212                                 | 1  | Pass        |
| 2442            | 1.0                    | 21.78                   | 150.661                | 0.02997                                 | 1  | Pass        |
| 2462            | 1.0                    | 24.13                   | 258.821                | 0.05149                                 | 1  | Pass        |

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                    | 18.66                   | 73.451                 | 0.01461                                 | 1  | Pass        |
| 2442            | 1.0                    | 18.30                   | 67.608                 | 0.01345                                 | 1  | Pass        |
| 2462            | 1.0                    | 21.18                   | 131.220                | 0.02610                                 | 1  | Pass        |