

## 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

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

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

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

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

Test Distance: 20cm(worst case)

(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            | 1.000                  | 14.01                   | 25.177                 | 0.00501                                 | 1                                                | Complies    |
| 2437            | 1.000                  | 14.64                   | 29.107                 | 0.00579                                 | 1                                                | Complies    |
| 2462            | 1.000                  | 14.78                   | 30.061                 | 0.00598                                 | 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            | 1.000                  | 14.45                   | 27.861                 | 0.00554                                 | 1                                                | Complies    |
| 2437            | 1.000                  | 15.09                   | 32.285                 | 0.00642                                 | 1                                                | Complies    |
| 2462            | 1.000                  | 15.44                   | 34.995                 | 0.00696                                 | 1                                                | Complies    |

(3)802.11n20 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            | 1.000                  | 14.72                   | 29.648                 | 0.00590                                 | 1                                                | Complies    |
| 2437            | 1.000                  | 15.16                   | 32.810                 | 0.00653                                 | 1                                                | Complies    |
| 2462            | 1.000                  | 15.43                   | 34.914                 | 0.00695                                 | 1                                                | Complies    |