## RF Exposure Evaluation

### Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($mW/cm^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3–3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0–30 | 1842/f | 4.89/f | *($900/f^2$) | 6 |
| 30–300 | 61.4 | 0.163 | 1.0 | 6 |
| 300–1500 | | | f/300 | 6 |
| 1500–100,000 | | | 5 | 6 |
| (B) 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 |
| 1500–100,000 | | | 1.0 | 30 |

f = frequency in MHz

Friis transmission formula: **$Pd = (Pout*G)/(4*pi*r^2)$**

Where

**Pd** = power density in $mW/cm^2$, **Pout** = output power to antenna in mW;

**G** = gain of antenna in linear scale, **Pi** = 3.1416;

**R** = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 $mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

**Test Result of RF Exposure Evaluation**

EDR:

| Mode | Output power to antenna (dBm) | Tune UP tolerance (dBm) | Max Tune UP power (dBm) | Max Tune UP power (mW) | Power Density at R=20cm (mW/cm2) | Limit (mW/cm2) | Result |
|---|---|---|---|---|---|---|---|
| GFSK | 1.976 | 2±1 | 3 | 2.00 | 0.00078 | 1.0 | PASS |
| π/4-DQPSK | 4.151 | 4±1 | 5 | 3.16 | 0.00124 | 1.0 | PASS |
| 8-DPSK | 4.664 | 4±1 | 5 | 3.16 | 0.00124 | 1.0 | PASS |

WIFI2.4G:

| Mode | Output power to antenna (dBm) | Tune UP tolerance (dBm) | Max Tune UP power (dBm) | Max Tune UP power (mW) | Power Density at R=20cm (mW/cm2) | Limit (mW/cm2) | Result |
|---|---|---|---|---|---|---|---|
| 802.11b | 15.088 | 15±1 | 16 | 39.81 | 0.01562 | 1.0 | PASS |
| 802.11g | 14.467 | 14±1 | 15 | 31.62 | 0.01241 | 1.0 | PASS |
| 802.11n20 | 13.892 | 14±1 | 15 | 31.62 | 0.01241 | 1.0 | PASS |
| 802.11n40 | 13.687 | 14±1 | 15 | 31.62 | 0.01241 | 1.0 | PASS |

Antenna gain for 2.4GWIFI and EDR: 2.95dBi

Conclusion:

For the max result : 0.01562≤ 1.0, compliance with FCC's RF Exposure

The Product unsupported at the same time to Transmitting.