



## RF EXPOSURE EVALUATION

According to FCC 1.1310 : 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<br>(MHz)                                | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm <sup>2</sup> ) | Average Time |
|---------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------------|--------------|
| (A) Limits for Occupational / Control Exposures         |                                  |                                  |                                        |              |
| 300-1,500                                               | --                               | --                               | F/300                                  | 6            |
| 1,500-100,000                                           | --                               | --                               | 5                                      | 6            |
| (B) Limits for General Population / Uncontrol Exposures |                                  |                                  |                                        |              |
| 300-1,500                                               | --                               | --                               | F/1500                                 | 6            |
| 1,500-100,000                                           | --                               | --                               | 1                                      | 30           |

### Friis Formula

Friis transmission formula :  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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.

### EUT Operating Condition

A 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

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

### Antenna Gain

(1) Antenna Gain (5GHz) : The maximum Gain measured in fully anechoic chamber is 1.24dBi linear scale.

(2) Antenna Gain (2.4GHz) : The maximum Gain measured in fully anechoic chamber is 1.37dBi linear scale.

### Output Power into Antenna & RF Exposure Evaluation Distance

| Channel | Channel Frequency (MHz) | Output Power to Antenna (dBm) | Antenna Gain | Power Density at 20cm (mW/cm <sup>2</sup> ) | LIMITS (mW/cm <sup>2</sup> ) |
|---------|-------------------------|-------------------------------|--------------|---------------------------------------------|------------------------------|
| Low     | 5745                    | 21.03                         | 1.24         | 0.033553                                    | 1                            |
| Middle  | 5785                    | 25.51                         | 1.24         | 0.094130                                    | 1                            |
| High    | 5825                    | 22.49                         | 1.24         | 0.046960                                    | 1                            |

Note : 1. For normal 802.11a Mode (6Mbps)

2. The power density Pd (4th column) at a distance of 20cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>. The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.

| Channel | Channel Frequency (MHz) | Output Power to Antenna (dBm) | Antenna Gain | Power Density at 20cm (mW/cm <sup>2</sup> ) | LIMITS (mW/cm <sup>2</sup> ) |
|---------|-------------------------|-------------------------------|--------------|---------------------------------------------|------------------------------|
| CH1     | 2412.00                 | 20.01                         | 1.37         | 0.027336                                    | 1                            |
| CH6     | 2437.00                 | 21.63                         | 1.37         | 0.039694                                    | 1                            |
| CH11    | 2462.00                 | 21.07                         | 1.37         | 0.034892                                    | 1                            |

Note : 1. For 802.11b Mode (11Mbps)

2. The power density Pd (4th column) at a distance of 20cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>. The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.



| Channel | Channel Frequency (MHz) | Output Power to Antenna (dBm) | Antenna Gain | Power Density at 20cm (mW/cm <sup>2</sup> ) | LIMITS (mW/cm <sup>2</sup> ) |
|---------|-------------------------|-------------------------------|--------------|---------------------------------------------|------------------------------|
| CH1     | 2412.00                 | 20.26                         | 1.37         | 0.028955                                    | 1                            |
| CH6     | 2437.00                 | 20.91                         | 1.37         | 0.03363                                     | 1                            |
| CH11    | 2462.00                 | 20.65                         | 1.37         | 0.031676                                    | 1                            |

Note : 1. For 802.11g Mode (6Mbps)

2. The power density Pd (4th column) at a distance of 20cm calculated from the fries transmission formula is far below the limit of 1 mW/cm<sup>2</sup> . The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.

| Channel | Channel Frequency (MHz) | Output Power to Antenna (dBm) | Antenna Gain | Power Density at 20cm (mW/cm <sup>2</sup> ) | LIMITS (mW/cm <sup>2</sup> ) |
|---------|-------------------------|-------------------------------|--------------|---------------------------------------------|------------------------------|
| Low     | 5765                    | 21.96                         | 1.24         | 0.041565                                    | 1                            |
| High    | 5785                    | 22.56                         | 1.24         | 0.047723                                    | 1                            |

Note : 1. For Super A Mode (108 Mbps)

2. The power density Pd (4th column) at a distance of 20cm calculated from the fries transmission formula is far below the limit of 1 mW/cm<sup>2</sup> . The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.

| Channel | Channel Frequency (MHz) | Output Power to Antenna (dBm) | Antenna Gain | Power Density at 20cm (mW/cm <sup>2</sup> ) | LIMITS (mW/cm <sup>2</sup> ) |
|---------|-------------------------|-------------------------------|--------------|---------------------------------------------|------------------------------|
| 6       | 2437                    | 21.99                         | 1.37         | 0.043125                                    | 1                            |

Note : 1. For Super G Mode (108 Mbps)

2. The power density Pd (4th column) at a distance of 20cm calculated from the fries transmission formula is far below the limit of 1 mW/cm<sup>2</sup> . The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.