

## 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) ,KDB-447498 D01 V06.

Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> )              | 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 <sup>2</sup> )              | 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:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

**Pd** = power density in mW/cm<sup>2</sup>, **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<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.

### 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

WI-FI Mode:

| Test Mode     | Channel           | Output power to antenna (mW) | Power Density at R=20cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|---------------|-------------------|------------------------------|-----------------------------------------------|-----------------------------|--------|
| 802.11b       | Lowest (2412MHz)  | 59.70353                     | 0.0188247                                     | 1.0                         | PASS   |
|               | Middle (2437MHz)  | 48.75285                     | 0.0153720                                     | 1.0                         | PASS   |
|               | Highest (2462MHz) | 53.82698                     | 0.0169718                                     | 1.0                         | PASS   |
| 802.11g       | Lowest (2412MHz)  | 45.60369                     | 0.0143790                                     | 1.0                         | PASS   |
|               | Middle (2437MHz)  | 38.45918                     | 0.0121263                                     | 1.0                         | PASS   |
|               | Highest (2462MHz) | 42.55984                     | 0.0134193                                     | 1.0                         | PASS   |
| 802.11n(HT20) | Lowest (2412MHz)  | 33.34264                     | 0.0105131                                     | 1.0                         | PASS   |
|               | Middle (2437MHz)  | 30.83188                     | 0.0097214                                     | 1.0                         | PASS   |
|               | Highest (2462MHz) | 30.90295                     | 0.0097438                                     | 1.0                         | PASS   |

Remark: antenna gain=2.0dBi