

## RF exposure

FCC ID : 2BDL2HFR4AM

According to FCC part 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 (MHz)                                   | Electric field strength(V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Average time |
|---|------------------------------|-------------------------------|-------------------------------------|--------------|
| (A) Limits for Occupational / Control 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 – 1 500   | --                           | --                            | f/300                               | 6            |
| 1 500 - 100000  | --                           | --                            | 5                                   | 6            |
| (B) Limits for General Population / Uncontrol Exposures |                              |                               |                                     |              |
| 0.3 – 1.34  | 614                          | 1.63                          | *(100)                              | 30           |
| 1.34 – 30   | 824/f                        | 2.19/f                        | *(180/f <sup>2</sup> )              | 30           |
| 3.0 - 300   | 27.5                         | 0.073                         | 0.2                                 | 30           |
| 300 – 1 500   | --                           | --                            | f/1500                              | 30           |
| 1 500 – 100 000   | --                           | --                            | 1                                   | 03           |

f= frequency in MHz

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

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

$P_d$  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 where the MPE limit is reached.

## Results

| Frequency (MHz) | Reading at 3 m (dB $\mu$ V) | Correction factor (dB/m) | Result at 3 m (dB $\mu$ V/m) | Result at 3 m (V/m) | Electric field strength at 20 cm (V/m) | Limit (V/m) |
|-----------------|-----------------------------|--------------------------|------------------------------|---------------------|--|-------------|
| 13.561 4 MHz    | 45.70                       | 19.67                    | 64.37                        | 0.002               | 23.532                                 | 60.76       |

Note.

Electric field strength at 20 cm (V/m) = Result at 3 m (V/m) + Distance correction factor\*

\*Distance correction factor =  $20 \times \log(\text{measure distance (3 m)} / \text{evaluate distance (0.2 m = 20 cm)}) = 23.53$