

## RF exposure

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<br>(脏)                                  | Electric field strength(V/m) | Magnetic field strength (A/m) | Power density<br>('m\/cm²) | Average time |  |
|---|------------------------------|-------------------------------|----------------------------|--------------|--|
| (A) Limits for Occupational / Control Exposures         |                              |                               |                            |              |  |
| 300 – 1 500   | 1                            |                               | f/300                      | 6            |  |
| 1 500 - 100000  |                              |                               | 5                          | 6            |  |
| (B) Limits for General Population / Uncontrol Exposures |                              |                               |                            |              |  |
| 300 – 1 500   | 1                            |                               | f/1500                     | 6            |  |
| 1 500 – 100 000   |                              |                               | 1                          | <u>30</u>    |  |

f= frequency in Mb

Friis transmission formula:  $Pd = (Pout \times G)/(4 \times pi \times R^2)$ 

Where,

Pd = power density in mW/cm²

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 the limit of MPE, 1 mW/cm². 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 (Worst case)

| Mode | Max tune-up power (dBm) | Antenna<br>gain (dBi) | Power density<br>at 20 cm(nW/cm) | Limit<br>(nW/cn²) |
|------|-------------------------|-----------------------|----------------------------------|-------------------|
| FHSS | -4                      | 0.00                  | 0.000 08                         | 1                 |