

FCC ID: 2AAU7-ZMZWUS

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 (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm ²) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposure | | | | |
| 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 |
| 300-1,500 | | | f/300 | 6 |
| 1,500-100,000 | | | 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 |
| 300-1,500 | | | f/1500 | 30 |
| 1,500-100,000 | | | 1.0 | 30 |

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

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

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.14115926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20 : 2412-2462MHz,

Power density limited: $1\text{mW}/\text{cm}^2$

Antenna Type: Metal Antenna;

WIFI antenna gain: 2dBi (ANT A);

R=20cm

$\text{mW}=10^{(\text{dBm}/10)}$

antenna gain Numeric= $10^{(\text{dBi}/10)}=10^{(2/10)}=1.58$

| Channel Freq. (MHz) | modulation | conducted power | Tune-up power | Max | | Antenna | Evaluation result at 20cm | Power density Limits |
|---------------------|-------------|-----------------|---------------|---------------|-----------|---------|------------------------------------|-----------------------|
| | | (dBm) | (dBm) | tune-up power | | Gain | Power density(mW/cm ²) | (mW/cm ²) |
| | | | | (dBm) | (mW) | Numeric | | |
| | | | | Ant A | Ant A | Ant A | | |
| 2412 | 802.11b | 14.4 | 14.5±1 | 15.5 | 35.481339 | 1.58 | 0.01115 | 1 |
| 2437 | | 14.8 | 14.5±1 | 15.5 | 35.481339 | 1.58 | 0.01115 | 1 |
| 2462 | | 15.1 | 14.5±1 | 15.5 | 35.481339 | 1.58 | 0.01115 | 1 |
| 2412 | 802.11g | 13.2 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| 2437 | | 13.2 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| 2462 | | 13.9 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| 2412 | 802.11n H20 | 13.2 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| 2437 | | 13.1 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| 2462 | | 13.9 | 13±1 | 14 | 25.118864 | 1.58 | 0.00790 | 1 |
| | | | | | | | | |
| | | | | | | | | |

Conclusion:

For the max result : $0.01115 \leq 1.0$ for for Max Power Density, compliance the RF Exposure.

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Signature:

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