

FCC §15.247 (i), §2.1091 – RF Exposure

FCC ID: 2AAU7-MNZWUS

Applied procedures / limit

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842 / f | 4.89 / f | (900 / f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | F/300 | 6 |
| 1500-100,000 | | | 5 | 6 |

Note: f is frequency in MHz

* = Power density limit is applicable at frequencies greater than 100 MHz

Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | | | F/1500 | 30 |
| 1500-100,000 | | | 1.0 | 30 |

Note: f = frequency in MHz

* = Plane-wave equivalent power density

MPE PREDICTION

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

TEST RESULTS

WIFI

| TX 802.11b Mode | | | | |
|---------------------|-----------|--|--|-------|
| Test Channel | Frequency | Maximum Peak Conducted Output Power (PK) | Maximum Peak Conducted Output Power (AV) | LIMIT |
| | (MHz) | (dBm) | (dBm) | dBm |
| CH01 | 2412 | 15.11 | 12.14 | 30 |
| CH06 | 2437 | 15.08 | 12.11 | 30 |
| CH11 | 2462 | 15.05 | 12.08 | 30 |
| TX 802.11g Mode | | | | |
| CH01 | 2412 | 14.51 | 11.38 | 30 |
| CH06 | 2437 | 14.55 | 11.42 | 30 |
| CH11 | 2462 | 14.47 | 11.34 | 30 |
| TX 802.11n(20) Mode | | | | |
| CH01 | 2412 | 14.21 | 11.38 | 30 |
| CH06 | 2437 | 14.23 | 11.47 | 30 |
| CH11 | 2462 | 14.21 | 11.38 | 30 |
| TX 802.11n(40) Mode | | | | |
| CH03 | 2422 | 12.54 | 10.12 | 30 |
| CH06 | 2437 | 12.61 | 10.19 | 30 |
| CH09 | 2452 | 12.61 | 10.19 | 30 |

| Mode | Range | Maximum peak output power (dBm) | Output power (mW) | Antenna Gain (numeric) | Power Density (S) (mW/ cm ²) | Limit of Power Density (S) (mW/ cm ²) | Result |
|--------------|-------|---------------------------------|-------------------|------------------------|--|---|--------|
| 802.11b | 11~13 | 13 | 19.95 | 2(1.58) | 0.0063 | 1 | Pass |
| 802.11g | 10~12 | 12 | 15.85 | 2(1.58) | 0.0050 | 1 | Pass |
| 802.11n-HT20 | 10~12 | 12 | 15.85 | 2(1.58) | 0.0050 | 1 | Pass |
| 802.11n-HT40 | 9~11 | 11 | 12.59 | 2(1.58) | 0.0040 | 1 | Pass |

| Frequency MHz | Range | Maximum peak output power (dBm) | Output power (mW) | Antenna Gain (numeric) | Power Density (S) (mW/ cm ²) | Limit of Power Density (S) (mW/ cm ²) | Result |
|---------------|-------|---------------------------------|-------------------|------------------------|--|---|--------|
| 2412-2462 | 11~13 | 13 | 19.95 | 2(1.58) | 0.0063 | 1 | Pass |