

1 Maximum Permissible Exposure

1.1 Maximum Permissible Exposure

1.1.1 Limit of Maximum Permissible Exposure

| 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 | 1,842 / 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 |
| 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 ²)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1,500 | - | - | F/1500 | 30 |
| 1,500-100,000 | - | - | 1.0 | 30 |
| Note 1: f = frequency in MHz ; *Plane-wave equivalent power density | | | | |
| Note 2: For the applicable limit, see FCC 1.1310 | | | | |

1.1.2 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

E = Electric field (V/m)

G = EUT Antenna numeric gain (numeric)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

P = RF output power (W)

d = Separation distance between radiator and human body (m)



1.1.3 Result of Maximum Permissible Exposure

| RF General Information 5150~5250MHz | | | | | |
|-------------------------------------|---------------------------|---------------------|----------------|--|-----------------------|
| Frequency Range (MHz) | IEEE Std. 802.11 Protocol | Ch. Frequency (MHz) | Channel Number | Number of Transmit Chains (N _{TX}) | RF Output Power (dBm) |
| 5150-5250 | a | 5180-5240 | 36-48 [4] | 3 | 24.22 |
| 5150-5250 | n (HT20) | 5180-5240 | 36-48 [4] | 3 | 24.72 |
| 5150-5250 | n (HT40) | 5190-5230 | 38-46 [2] | 3 | 27.47 |
| 5150-5250 | ac (VHT20) | 5180-5240 | 36-48 [4] | 3 | 24.65 |
| 5150-5250 | ac (VHT40) | 5190-5230 | 38-46 [2] | 3 | 27.48 |
| 5150-5250 | ac (VHT80) | 5210 | 42 [1] | 3 | 18.93 |

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

| RF General Information 5725 MHz – 5850 MHz | | | | | |
|--|---------------------------|---------------------|----------------|--|-----------------------|
| Frequency Range (MHz) | IEEE Std. 802.11 Protocol | Ch. Frequency (MHz) | Channel Number | Number of Transmit Chains (N _{TX}) | RF Output Power (dBm) |
| 5725-5850 | a | 5745-5825 | 149-165 [5] | 3 | 25.87 |
| 5725-5850 | n(HT20) | 5745-5825 | 149-165 [5] | 3 | 25.91 |
| 5725-5850 | n(HT40) | 5755-5795 | 151-159 [2] | 3 | 28.33 |
| 5725-5850 | ac(VHT20) | 5745-5825 | 149-165 [5] | 3 | 27.77 |
| 5725-5850 | ac(VHT40) | 5755-5795 | 151-159 [2] | 3 | 28.03 |
| 5725-5850 | ac(VHT80) | 5775 | 155 [1] | 3 | 17.28 |

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

| RF General Information 2400 MHz – 2483.5 MHz | | | | | |
|--|---------------------------|---------------------|----------------|--|-----------------------|
| Frequency Range (MHz) | IEEE Std. 802.11 Protocol | Ch. Frequency (MHz) | Channel Number | Number of Transmit Chains (N _{TX}) | RF Output Power (dBm) |
| 2400-2483.5 | b | 2412-2462 | 1-11 [11] | 3 | 26.08 |
| 2400-2483.5 | g | 2412-2462 | 1-11 [11] | 3 | 24.34 |
| 2400-2483.5 | n (HT20) | 2412-2462 | 1-11 [11] | 3 | 23.75 |
| 2400-2483.5 | n (HT40) | 2422-2452 | 3-9 [7] | 3 | 21.44 |

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.



| Worst Maximum RF Output Power Result | | | | | |
|---|-----------------------|--|-----------------|-------------------|-----------------------------------|
| Exposure Environment | | General Population / Uncontrolled Exposure | | | |
| Separation Distance (cm) | | 20 | | | |
| Condition | | RF Output Power (dBm) | | | |
| Modulation Mode | N_{TX} | RF Output Power (dBm) | DG (dBi) | EIRP Power | PD (S) (mW/cm²) |
| 11N-HT40 | 3 | 28.33 | 4.85 | 33.18 | 0.414 |
| 11b | 3 | 26.08 | 3.95 | 30.03 | 0.200 |
| Co-location Total | | | | | 0.614 |
| Maximum Permissible Exposure Limit (mW/cm²) | | | | | 1 |
| Note 1: N _{TX} = Number of Transmit Chains | | | | | |