# **RF Exposure Evaluation**

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FCC ID : K7SF7D4555V1

# 1. Maximum Permissible Exposure

## 1.1. Applicable Standard

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	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

(B) 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/ cm²)	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

## 1.2. MPE Calculation Method

E (V/m) = 
$$\frac{\sqrt{30 \times P \times G}}{d}$$
 Power Density:  $Pd$  (W/m²) =  $\frac{E^2}{377}$ 

**E** = Electric field (V/m)

**P** = Peak RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

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

The formula can be changed to

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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

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## 1.3. Calculated Result and Limit

**Antenna Type: PCB Antenna** 

Max Conducted Power for IEEE 802.11b/g/n 2.4GHz

#### Mobile

Operating Frequency (GHz)	Min. User Distance (cm)	Gain (dBi)	Numeric Gain	Output Power (dBm)	Conducted Power (mW)	Power Density (mW/cm2)
2.437	20	4.27	2.673006	19.58	90.7821	0.0483

#### Max Conducted Power for IEEE 802.11a/n 5GHz

#### **Mobile**

### Band 1

Operating Frequency (GHz)	Min. User Distance (cm)	Gain (dBi)	Numeric Gain	Output Power (dBm)	Conducted Power (mW)	Power Density (mW/cm2)
5.240	20	2.84	2.673006	14.65	29.1743	0.0112

#### Band 4

Operating Frequency (GHz)	Min. User Distance (cm)	Gain (dBi)	Numeric Gain	Output Power (dBm)	Conducted Power (mW)	Power Density (mW/cm2)
5.745	20	4.06	2.673006	20.60	114.8154	0.0582

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