

MPE Calculation : 2.4GHZ WiFi & BLE

RF function or Mode	Frequency range (MHz)	Max Target Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm ²)	Requirement (mW/cm ²)
802.11b	2412.00 ~ 2462.00	17.00	2.71	19.71	93.541	0.0187	1.000
802.11g	2412.00 ~ 2462.00	13.00	2.71	15.71	37.240	0.0075	1.000
802.11n(HT20)	2412.00 ~ 2462.00	12.00	2.71	14.71	29.581	0.0060	1.000
Bluetooth LE	2402.00 ~ 2480.00	4.00	2.71	6.71	4.689	0.0010	1.000
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The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

The MPE sample calculation for this exposure is shown below.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 93.541 / (4 \times 20^2 \times \pi) \\
 &= 0.0187 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenn

▪ Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric Field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm ²)	Averageing time (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

Conclusion : The exposure condition of this device is compliant with FCC

MPE Calculation : **Sub-1G**

RF function or Mode	Frequency range (MHz)			Max Target Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm ²)	Requirement (mW/cm ²)
Sub-1G	915.00	~	915.00	7.00	-0.30	6.70	4.678	0.0010	0.610
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The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

The MPE sample calculation for this exposure is shown below.

$$\begin{aligned}
 \bullet S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 4.678 / (4 \times 20^2 \times \pi) \\
 &= 0.001 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenn

▪ Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)			Electric Field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm ²)	Averageing time (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

Conclusion : The exposure condition of this device is compliant with FCC

RF Exposure Compliance for simultaneous operations

- **Configurations for simultaneous operations**

- **Configuration 1:** BT or WiFi + Sub-1G

Note: Above configuration was declared from applicant.

- **Configurations for simultaneous operation**

RF function or mode	WiFi	Sub-1G	-	-	-	-	Σ of MPE ratios
Band	2.4GHz	915MHz	-	-	-	-	
Power Density (mW/cm ²)	0.0187	0.0010					
Requirement (mW/cm ²)	1.0000	0.6100					
MPE ratio (Power Density/Requirement)	0.0187	0.0016					
Configuration 1 (MPE ratio)	0.0187	0.0016					0.0203

Note: The maximum power density in each RF function was used for above table.

- **Requirement = Σ of MPE ratios ≤ 1**

Conclusion : The exposure condition of this device is compliant with FCC rules.