

MPE Calculation : Bluetooth

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)
Bluetooth(1Mbps)	2402.00	~	2480.00	1.00	3.88	4.88	3.077	0.0007	1.000
Bluetooth(2&3Mbps)	2402.00	~	2480.00	1.00	3.88	4.88	3.077	0.0007	1.000
		~							
		~							
		~							
		~							
		~							
		~							

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 3.077 / (4 \times 20^2 \times \pi) \\
 &= 0.0007 \text{ mW/cm}^2
 \end{aligned}$$

- 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 : 2.4G & 5G WLAN

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)	Requirment (mW/cm ²)
2.4G WLAN_802.11b	2412.00	~	2462.00	15.00	3.19	18.19	65.918	0.0132	1.000
2.4G WLAN_802.11g	2412.00	~	2462.00	12.00	3.19	15.19	33.037	0.0066	1.000
2.4G WLAN_802.11n(HT20)	2412.00	~	2462.00	12.00	3.19	15.19	33.037	0.0066	1.000
2.4G WLAN_802.11n(HT40)	2422.00	~	2452.00	11.00	3.19	14.19	26.243	0.0053	1.000
UNII-1_802.11a	5180.00	~	5240.00	8.50	5.40	13.90	24.548	0.0050	1.000
UNII-1_802.11n(HT20)	5180.00	~	5240.00	8.50	5.40	13.90	24.548	0.0050	1.000
UNII-1_802.11n(HT40)	5190.00	~	5230.00	8.50	5.40	13.90	24.548	0.0050	1.000
UNII-2A_802.11a	5260.00	~	5320.00	8.50	5.40	13.90	24.548	0.0050	1.000
UNII-2A_802.11n(HT20)	5260.00	~	5320.00	8.50	5.40	13.90	24.548	0.0050	1.000
UNII-2A_802.11n(HT40)	5270.00	~	5310.00	8.50	5.40	13.90	24.548	0.0050	1.000

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 65.918 / (4 \times 20^2 \times \pi) \\
 &= 0.0132 \text{ mW/cm}^2
 \end{aligned}$$

- 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 + WLAN

Note: Above configuration was declared from applicant.

- **Configurations for simultaneous operatio**

RF function or mode	BT	WLAN		-		-		Σ of MPE ratios
Band	2.4GHz	2.4G & 5G	-	-	-	-	-	
Power Density (mW/cm2)	0.0007	0.0132						
Requirement (mW/cm2)	1.0000	1.0000						
MPE ratio (Power Density/Requirement)	0.0007	0.0132						
Configuration 1 (MPE ratio)	0.0007	0.0132						0.0139

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

▪ Requirment = Σ of MPE ratios ≤ 1

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