

MPE Calculation : Zigbee

RF function or Mode	Transmitting Frequency (MHz)	Max. Target Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm ²)	Requirement (mW/cm ²)
Zigbee	2475.00	10.50	1.70	12.20	16.596	0.0034	1.000

Note: Please refer to the operation description for Max tune-up power.

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 16.596 / (4 \times 20^2 \times \pi) \\
 &= 0.0034 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

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

▪ 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 : **WLAN**

RF function or Mode	Transmitting Frequency (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	2462.00	14.50	2.76	17.26	53.211	0.0106	1.000
802.11g	2462.00	12.00	2.76	14.76	29.923	0.0060	1.000
802.11n(HT20)	2462.00	11.00	2.76	13.76	23.769	0.0048	1.000
802.11n(HT40)	2437.00	9.00	2.76	11.76	14.997	0.0030	1.000

Note: Please refer to the operation description for Max tune-up power.

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 53.211 / (4 \times 20^2 \times \pi) \\
 &= 0.0106 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

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

▪ 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 operation

RF function or mode	Zigbee	WLAN	-	-	-	-	-	Σ of MPE ratios
Band	2.4GHz	2.4GHz	-	-	-	-	-	
Power Density (mW/cm2)	0.0034	0.0106	-	-	-	-	-	
Requirement (mW/cm2)	1.0000	1.0000	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.0034	0.0106	-	-	-	-	-	
Configuration 1 (MPE ratio)	0.0034	0.0106	-	-	-	-	-	0.0140
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

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.