MPE Calculation

RF feature(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 LE(1Mbps)	2 402.00	~	2 480.00	1.00	0.21	1.21	1.322	0.000 3	1.000 0
		~							
		~							
		~							
		~							
		~							
		~							
		~							

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.

▪ **S =** EIRP / (4 R^2 π)

= 1.322 / (4 X 20^2 X π)

= 0.000 mW/cm^2

- Note

S= Maximum power density(mW/cm^2)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(2(

▪ Limits for Maximum Permissible Exposure (MPE)

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

RF feature(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)
WALN(802.11b)	2 412.00	~	2 462.00	13.50	0.21	13.71	23.497	0.004 7	1.000 0
WALN(802.11g)	2 412.00	~	2 462.00	14.50	0.21	14.71	29.581	0.005 9	1.000 0
WALN(802.11n)	2 412.00	~	2 462.00	13.50	0.21	13.71	23.497	0.004 7	1.000 0
WLAN(802.11a)	5 180.00	~	5 240.00	8.50	-3.56	4.94	3.119	0.000 7	1.000 0
WLAN(802.11n-HT20)	5 180.00	~	5 240.00	6.00	-3.56	2.44	1.754	0.000 4	1.000 0
WLAN(802.11n-HT40)	5 180.00	~	5 240.00	6.00	-3.56	2.44	1.754	0.000 4	1.000 0
		~							
		~							

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.

▪ **S =** EIRP / (4 R^2 π)

= 23.497 / (4 X 20^2 X π)

= 0.005 mW/cm^2

- Note

S= Maximum power density(mW/cm^2)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(2(

▪ Limits for Maximum Permissible Exposure (MPE)

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

RF feature(Mode)	Frequency range (MHz)			Max .Target EIRP (dBm)	ANT Gain (dBi)	Max. Tune-up EIRP (dBm)	Max Tune-up EIRP (mW)	Maximum power density (mW/cm^2)	Requirement (mW/cm^2)
24 GHz Radar(FMCW)	24 050.00	~	24 250.00	3.70	2.00	3.70	2.345	0.000 5	1.000 0
		~							
		~							
		~							
		~							
		~							
		~							
		~							

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.

▪ **S =** EIRP / (4 R^2 π)

= 2.345 / (4 X 20^2 X π)

= 0.001 mW/cm^2

- Note

S= Maximum power density(mW/cm^2)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(2(

▪ Limits for Maximum Permissible Exposure (MPE)

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

- **Worst case for simultaneous operations**
- BLE(1 Mbps) + WLAN(2.4 GHz) + 24 GHz Radar

RF feature or mode	BLE(1 Mbps)	WLAN(802.11g)	Radar	-	-	-	-	Σ of MPE ratios
Band(Worst case)	2.4 GHz	2.4 GHz	24 GHz	-	-	-	-	
Power Density (mW/cm2)	0.000 3	0.005 9	0.000 5	-	-	-	-	
Requirement (mW/cm2)	1.000 0	1.000 0	1.000 0	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.000 3	0.005 9	0.000 5	-	-	-	-	
Worst case(MPE ratio)	0.000 3	0.005 9	0.000 5	-	-	-	-	0.006 7

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

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