MPE Calculation(Bluetooth LE)

RF feauture (Worst-case mode)	Frequency range (MHz)			Max Target Power (dBm)[Note1]	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm^2)	Requriment (mW/cm^2)
Bluetooth LE(1 Mbps)	2 402.0	~	2 480.0	1.50	1.90	3.40	2.188	0.001	1.000
		~							
		~							
		~							
		~							
		~							
		~							
		~							

Note: Please refer to the tune-up procedure for MAX. Target 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 =** $EIRP / (4 R^2 \pi)$

= $2.188 / (4 \times 20^2 \times \pi)$

= $0.001\ mW/cm^2$

- 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)	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 feauture (Worst-case mode)	Frequency range (MHz)			Max Target Power (dBm)[Note1]	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm^2)	Requriment (mW/cm^2)
WLAN(802.11b)	2 412.0	~	2 462.0	19.50	2.13	21.63	145.546	0.029	1.000
WLAN(802.11a)	5 180.0	~	5 240.0	13.00	1.01	14.01	25.177	0.006	1.000
WLAN(802.11a)	5 745.0	~	5 825.0	15.00	2.30	17.30	53.704	0.011	1.000
		~							
		~							
		~							
		~							
		~							

Note: Please refer to the tune-up procedure for MAX. Target 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 =** $EIRP / (4 R^2 \pi)$

= $145.546 / (4 \times 20^2 \times \pi)$

= $0.029\ mW/cm^2$

- 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)	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

- **Worst case for simultaneous operations**
- BLE(1Mbps) + WLAN 2.4GHz(802.11b)

RF function or mode(Worst case)	BLE(1Mbps)	WLAN(802.11b)	-	-	-	-	-	Σ of MPE ratios
Band	2.4GHz	2.4GHz	-	-	-	-	-	
Power Density (mW/cm2)	0.001	0.029	-	-	-	-	-	
Requirement (mW/cm2)	1.000	1.000	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.001	0.029	-	-	-	-	-	
Worst case(MPE ratio)	0.001	0.029	-	-	-	-	-	0.030

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

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