

MPE Calculation

Regulation(s): Part 1.1310, Part 2.1091

Method: KDB447498 D01v06

RF feature (Worst case 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(1 Mbps)	2 402.00 ~ 2 480.00	-3.00	1.21	-1.79	0.663	0.000 2	1.000 0
WLAN(802.11b)	2 412.00 ~ 2 462.00	17.00	1.21	18.21	66.222	0.013 2	1.000 0
WLAN(802.11n HT20)	5 180.00 ~ 5 240.00	10.00	1.64	11.64	14.589	0.003 0	1.000 0
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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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 0.663 / (4 \times 20^2 \times \pi) \\
 &= 0.0002 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(20cm)

Part 1.1310

▪ 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 5GHz 802.11n(HT20)

RF feature or mode	BLE	WLAN	-	-	-	-	-	Σ of MPE ratios
Band(Worst case)	2.4GHz	5GHz	-	-	-	-	-	
Power Density (mW/cm ²)	0.000 2	0.003 0	-	-	-	-	-	
Requirement (mW/cm ²)	1.000 0	1.000 0	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.000 2	0.003 0	-	-	-	-	-	
Worst case(MPE ratio)	0.000 2	0.003 0	-	-	-	-	-	

- Requirement = Σ of MPE ratios ≤ 1

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