

MPE Calculation

Regulation(s): Part 1.1310, Part 2.1091

Method: KDB447498 D01v06

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(1Mbps)	2 402.00	~	2 480.00	2.00	0.95	2.95	1.973	0.000 4	1.000 0
Bluetooth(2,3Mbps)	2 402.00	~	2 480.00	-0.50	0.95	0.45	1.110	0.000 3	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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 1.973 / (4 \times 20^2 \times \pi) \\
 &= 0.000 \text{ mW/cm}^2
 \end{aligned}$$

- 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

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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)
WLAN 802.11g_Ant 2	2 412.00	~	2 462.00	6.00	0.80	6.80	4.787	0.001 0	1.000 0
WLAN 802.11n(HT40)_Ant 1	5 180.00	~	5 240.00	9.00	-0.85	8.15	6.532	0.001 3	1.000 0
WLAN 802.11n(HT40)_Ant 2	5 180.00	~	5 240.00	5.50	-0.78	4.72	2.965	0.000 6	1.000 0
WLAN 802.11n(HT40)_Ant 1	5 745.00	~	5 825.00	8.00	-0.77	7.23	5.285	0.001 1	1.000 0
WLAN 802.11n(HT40)_Ant 2	5 745.00	~	5 825.00	7.00	-0.21	6.79	4.776	0.001 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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 4.787 / (4 \times 20^2 \times \pi) \\
 &= 0.001 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

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Part 1.1310

▪ Limits for Maximum Permissible Exposure (MPE)

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

RF Exposure Compliance for simultaneous operations

- Worst case for simultaneous operations
- BT + WLAN(5GHz)

RF feature or mode	BT	WLAN	-	-	-	-	-	Σ of MPE ratios
Band(Worst case)	2.4GHz	5GHz (NII-1)	-	-	-	-	-	
Power Density (mW/cm2)	0.000 4	0.001 3	-	-	-	-	-	
Requirement (mW/cm2)	1.000 0	1.000 0	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.000 4	0.001 3	-	-	-	-	-	
Worst case(MPE ratio)	0.000 4	0.001 3	-	-	-	-	-	0.001 7

- Requirement = $\Sigma \text{ of MPE ratios} \leq 1$

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