

MPE Calculation

Specification: Part 1.1310, Part 2.1091, 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	4.50	4.84	9.34	8.591	0.001 8	1.000 0
Bluetooth(2,3Mbps)	2 402.00 ~ 2 480.00	4.50	4.84	9.34	8.591	0.001 8	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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 8.591 / (4 \times 20^2 \times \pi) \\
 &= 0.002 \text{ mW/cm}^2
 \end{aligned}$$

- 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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WLAN 802.11b	2 412.00 ~ 2 462.00	5.00	4.49	9.49	8.893	0.001 8	1.000 0
WLAN 802.11a(Antenna 1)	5 180.00 ~ 5 240.00	6.00	2.48	8.48	7.047	0.001 5	1.000 0
WLAN 802.11a(Antenna 2)	5 180.00 ~ 5 240.00	8.50	1.31	9.81	9.572	0.002 0	1.000 0
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RF Exposure Compliance for simultaneous operations

- **Worst case for simultaneous operations**
- BT + WLAN(5GHz Antenna 1)
- WLAN(5GHz Antenna 1) + WLAN(5GHz Antenna 2)

RF feature or mode	BT	WLAN(5GHz)	WLAN(5GHz)	-	-	-	-	Σ of MPE ratios
Band(Worst case)	2.4GHz(1Mbps)	802.11a(Ant 1)	802.11a(Ant 2)	-	-	-	-	
Power Density (mW/cm ²)	0.001 8	0.001 5	0.002 0	-	-	-	-	
Requirement (mW/cm ²)	1.000 0	1.000 0	1.000 0	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.001 8	0.001 5	0.002 0	-	-	-	-	
BT + WLAN(5GHz Antenna 1):	0.001 8	0.001 5		-	-	-	-	0.003 3
WLAN(5GHz Antenna 1) + WLAN(5GHz Antenna 2)		0.001 5	0.002 0	-	-	-	-	0.003 5

- Requirement = Σ of MPE ratios ≤ 1

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