

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(1 Mbps)	2 402.00 ~ 2 480.00	9.50	0.92	10.42	11.016	0.002 2	1.000 0
Bluetooth(2, 3 Mbps)	2 402.00 ~ 2 480.00	7.50	0.92	8.42	6.951	0.001 4	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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 11.016 / (4 \times 20^2 \times \pi) \\
 &= 0.002 \text{ mW/cm}^2
 \end{aligned}$$

- 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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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 802.11b	2 412.00	~ 2 462.00	16.00	0.92	16.92	49.204	0.009 8	1.000 0
WLAN 802.11a	5 180.00	~ 5 240.00	12.50	-3.19	9.31	8.532	0.001 7	1.000 0
WLAN 802.11a	5 745.00	~ 5 785.00	12.00	-2.40	9.60	9.121	0.001 9	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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 49.204 / (4 \times 20^2 \times \pi) \\
 &= 0.010 \text{ mW/cm}^2
 \end{aligned}$$

- Note

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Part 1.1310

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RF Exposure Compliance for simultaneous operations

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

RF feature	BT	WLAN	-	-	-	-	-	Σ of MPE ratios
Worst case(MPE ratio)	2.4GHz	5GHz	-	-	-	-	-	
Power Density (mW/cm ²)	0.002 2	0.001 9	-	-	-	-	-	
Requirement (mW/cm ²)	1.000 0	1.000 0	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.002 2	0.001 9	-	-	-	-	-	
Worst case(MPE ratio)	0.002 2	0.001 9	-	-	-	-	-	

- Requirement = Σ of MPE ratios ≤ 1

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