

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 | 3.00 | 4.49 | 7.49 | 5.611 | 0.001 2 | 1.000 0 |
| Bluetooth(2, 3 Mbps) | 2 402.00 ~ 2 480.00 | 4.00 | 4.49 | 8.49 | 7.064 | 0.001 5 | 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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 5.611 / (4 \times 20^2 \times \pi) \\
 &= 0.001 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)
 EIRP= Equivalent Isotropic Radiated Power(mW)
 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 (SISO) | 2 412.00 ~ 2 462.00 | 5.50 | 4.84 | 10.34 | 10.815 | 0.002 2 | 1.000 0 |
| WLAN 802.11ac(VHT80) (2TX) | 5 180.00 ~ 5 240.00 | 12.00 | 5.22 | 17.22 | 52.723 | 0.010 5 | 1.000 0 |
| WLAN 802.11n(HT20) (2TX) | 5 745.00 ~ 5 825.00 | 12.50 | 7.02 | 19.52 | 89.537 | 0.017 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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 10.815 / (4 \times 20^2 \times \pi) \\
 &= 0.002 \text{ mW/cm}^2
 \end{aligned}$$

- 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

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| 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
- BT + 5GHz WLAN

| RF feature | BT | WLAN | - | - | - | - | - | Σ of MPE ratios |
|---------------------------------------|---------|---------|---|---|---|---|---|-----------------|
| Worst case(MPE ratio) | 2.4GHz | 5GHz | - | - | - | - | - | |
| Power Density (mW/cm ²) | 0.001 5 | 0.017 9 | - | - | - | - | - | |
| Requirement (mW/cm ²) | 1.000 0 | 1.000 0 | - | - | - | - | - | |
| MPE ratio (Power Density/Requirement) | 0.001 5 | 0.017 9 | - | - | - | - | - | |
| Worst case(MPE ratio) | 0.001 5 | 0.017 9 | - | - | - | - | - | 0.019 4 |

- Requirement = Σ of MPE ratios ≤ 1

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