

MPE Calculation : Bluetooth

| RF function or 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) | 2402.00 | ~ | 2480.00 | 1.50 | -0.18 | 1.32 | 1.356 | 0.0003 | 1.000 |
| Bluetooth(2,3Mbps) | 2402.00 | ~ | 2480.00 | -3.50 | -0.18 | -3.68 | 0.429 | 0.0001 | 1.000 |
| | | ~ | | | | | | | |
| | | ~ | | | | | | | |
| | | ~ | | | | | | | |
| | | ~ | | | | | | | |
| | | ~ | | | | | | | |
| | | ~ | | | | | | | |

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 1.356 / (4 \times 20^2 \times \pi) \\
 &= 0.0003 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenn

▪ Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | | | Electric Field strength (V/m) | Magnetic field strength (A/m) | Power Density (mW/cm ²) | Averageing 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

MPE Calculation : WLAN

| Mode(Worst case) | 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) |
|------------------|-----------------------|---|---------|------------------------|----------------|--------------------|-------------------|---|-----------------------------------|
| 802.11g | 2412.00 | ~ | 2462.00 | 12.00 | -0.01 | 11.99 | 15.813 | 0.0032 | 1.000 |
| 802.11a | 5180.00 | ~ | 5240.00 | 10.00 | -0.61 | 9.39 | 8.690 | 0.0018 | 1.000 |
| 802.11a | 5260.00 | ~ | 5320.00 | 10.00 | -0.18 | 9.82 | 9.595 | 0.0020 | 1.000 |
| 802.11a | 5500.00 | ~ | 5720.00 | 9.00 | -0.77 | 8.23 | 6.653 | 0.0014 | 1.000 |
| 802.11a | 5745.00 | ~ | 5825.00 | 8.00 | -0.18 | 7.82 | 6.054 | 0.0013 | 1.000 |
| | | ~ | | | | | | | |
| | | | | | | | | | |
| | | ~ | | | | | | | |

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.

$$\begin{aligned}
 S &= \text{EIRP} / (4 R^2 \pi) \\
 &= 8.690 / (4 \times 20^2 \times \pi) \\
 &= 0.002 \text{ mW/cm}^2
 \end{aligned}$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenn

▪ Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | | | Electric Field strength (V/m) | Magnetic field strength (A/m) | Power Density (mW/cm ²) | Averageing 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
- BT + WLAN(5GHz)

| | | | | | | | | |
|---------------------------------------|--------|-----------|---|---|---|---|---|-----------------|
| RF function or mode(Worst case) | BT | WLAN 5GHz | - | - | - | - | - | Σ of MPE ratios |
| Band(Worst case) | 2.4GHz | NII-2A | - | - | - | - | - | |
| Power Density (mW/cm2) | 0.0003 | 0.0020 | | | | | - | |
| Requirement (mW/cm2) | 1.0000 | 1.0000 | | | | | - | |
| MPE ratio (Power Density/Requirement) | 0.0003 | 0.0020 | | | | | - | 0.0023 |
| Worst case(MPE ratio) | 0.0003 | 0.0020 | | | | | | |

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

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