

SAR Exemption/Exclusion

General Information:

Technology:	BLE
Frequency:	2400-2480
Declared Conducted	1.25dBm or 1.33mW
Average Power:	
Antenna Gain:	4.20 dBi
Tune-Up Tolerance:	±2 dB
Antenna to User Separation:	9.8mm
Maximum Duty Cycle:	86% or -0.66dB
Usage:	Limb/Extremity

Calculated Maximum Average Power (EIRP):

1.25dBm(declared) + 4.20dBi(antenna) + 2.00dB(tune-up) -0.66dB(duty-cycle) = **6.79dBm or 4.77mW**

FCC:

Method: KDB 447498 D01 General RF Exposure Guidance v06

4.3.1.a) For 100 MHz to 6 GHz and test separation distances ≤50mm, the 10-g SAR test exclusion threshold is determined by the following:

$$\frac{\text{Max Power(mW)}}{\text{Min Separation Distance (mm)}} \cdot \sqrt{\text{Frequency(GHz)}} \leq 7.5 \text{ (for 10g extremity SAR)}$$

Solving for Max power gives the equation:

$$\text{Max Power (mW)} \leq 7.5 \cdot \frac{\text{Min Separation Distance (mm)}}{\sqrt{\text{Frequency (GHz)}}}$$

Substituting 9.8 mm separation distance (see Operational Description exhibit for details) and a frequency of 2.48GHz gives us a maximum power limit of 46.67mW.

The device's maximum output power of 4.77mW is less than the maximum power limit of 46.67mW.

Therefore, this device is exempt from FCC SAR testing.

Canada RSS-102:

Method: RSS-102 Issue 6, Section 6.3 SAR Exemption Limits.

Table 11 from RSS-102 Issue 6 has the following. We have adjusted the power levels by a factor of 2.5 as is allowed for limb-worn devices. Additionally, we added a row for 2480MHz, which was interpolated between 2450 and 3500MHz; and we have added a column for 9.8 mm, which was interpolated between 5 and 10mm.

Frequency (MHz)	Power Limit at ≤5 mm separation (mW)	Power Limit at 9.8 mm separation (mW)	Power Limit at 10mm separation (mW)
2450	7.50	17.10	17.50
2480	7.43	17.03	17.43
3500	5.00	14.60	15.00

The power limit of 17.03mW for the larger of the maximum conducted power or equivalent isotropic radiated power (EIRP), source-based and time-averaged.

The device's maximum output power of 4.77mW is less than 17.03mW as shown in Table 11.

Therefore, we are exempt from RSS-102 SAR testing.