

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Passed**

Test standard : FCC CFR 47 Part 2 Subpart J Section 2.1093
KDB 447498 D01 v06
RSS-102 Issue 5, Table 4

The test product is a watch and belongs to the wearing device. Use distance less than 5mm.

FCC SAR Exposure:**Limit :**

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation³¹

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

Result:

WiFi 2.4G , F(GHz) is 2.462

Maximum Average Power is 6.84mW for Wifi 2.4GHz

$$(6.84 / 5) * \sqrt{2.462} = 2.128$$

BLE , F(GHz) is 2.480

Maximum Average Power is 0.43mW for BLE

$$(0.43 / 5) * \sqrt{2.480} = 0.135$$

Co-location SAR exposure is $2.128 + 0.135 = 2.263$

$2.258 < 7.5$ for 10-g extremity SAR. Therefore, the test of SAR can be excluded.

IC SAR Exposure:
Limit Canada:

Exemption Limits for Routine Evaluation - SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For Limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

Result:

For Limb-worn devices, the exemption SAR limit is $4\text{mW} * 2.5 = 10\text{mW}$

The product WiFi 2.4GHz maximum average conducted output power is 6.84mW.

The product BLE maximum average conducted output power is 0.43mW.

Co-loaction SAR exposure is $6.84\text{mW} + 0.43\text{mW} = 7.27\text{mW}$

Therefore, the test of SAR can be excluded.