



RF Exposure Analysis for Exemption from Extremity SAR Testing

FCC ID: ZDLST6

Analysis for FCC portable use

Standalone SAR test exclusion considerations are defined in KDB 447498 D01, Chapter 4.3.1 where the 1-g head or body and 10-g extremity SAR exclusion threshold is defined by the following formula:

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

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The Buddi Ltd. Smart Tag 4 (model: 3430013) is an ankle worn location tracking device that contains three separate radio functions: Cellular, WLAN and SDR that operate at the following frequency bands and the following conducted output powers (inclusive of tune up tolerance):

SRD:

902MHz to 928MHz: -7.0dBm (0.2mW)

WLAN:

2412MHz to 2462MHz: +17.0dBm (50mW)

Cellular (2G, data only):

GSM850: 824MHz to 849MHz: +33.5dBm (2239mW)

GSM1900: 1850MHz to 1910MHz: 31.5dBm (1413mW)

Cellular (LTE 4G):

The four bands of operation are:

824 to 849MHz, 1850 to 1910MHz, 1710 to 1755MHz and 699 to 716MHz

The conducted output power for all five bands is +24dBm (251mW)

There is no simultaneous transmission between the Cellular, WLAN and SDR radio functions of the Buddi Ltd. Smart Tag 4 (model: 3430013).

In accordance with KDB 447498 D01 v06, section 6.3 and KDB 865664 D02, section 2.4, as the Buddi Ltd. Smart Tag 4 (model: 3430013) is an ankle worn location tracking device, the device can be subject to a low transmission, duty factor.

The Cellular and WLAN operation of the Buddi Ltd. Smart Tag 4 (model: 3430013) is subject to a duty factory of 0.22%. This duty factor is encoded into the product's firmware and cannot be altered by the end user.

Exemption from Extremity SAR testing is assessed for each radio function:

1/. SRD: Extremity SAR with a separation distance of 5mm

Applying the applicable data using the given KDB 447498 D01 formula, and minimum separation distance of 5mm, the following results:

$$(0.2\text{mW} / 5.0 \text{ mm}) \times \sqrt{0.928 \text{ GHz}} = 0.04 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

2/. WLAN: Extremity SAR with a separation distance of 5mm

Applying the applicable data using the given KDB 447498 D01 formula, and minimum separation distance of 5mm, the following results:

$$(\{50\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{2.462 \text{ GHz}} = 0.03 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

3/. 2G GSM850: Extremity SAR with a separation distance of 5mm

Applying the applicable data using the given KDB 447498 D01 formula, and minimum separation distance of 5mm, the following results:

$$(\{2239\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{0.849 \text{ GHz}} = 0.9 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

4/. 2G GSM1900: Extremity SAR with a separation distance of 5mm

Applying the applicable data using the given KDB 447498 D01 formula, and minimum separation distance of 5mm, the following results:

$$(\{1413\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{1.91 \text{ GHz}} = 0.9 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

5/. 4G LTE: Extremity SAR with a separation distance of 5mm

Applying the applicable data using the given KDB 447498 D01 formula, and minimum separation distance of 5mm, the following results:

(The output power is the same for all bands so the highest value of result will be generated by the highest frequency =>1910MHz)

$$(\{251\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{1.91 \text{ GHz}} = 0.2 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

Conclusion

The above calculations demonstrate that the Buddi Ltd. Smart Tag 4 (model: 3430013) meets the criteria for 10-g extremity SAR test exemption at a separation distance of 5mm.



Signature: _____ Date: _____ 12/3/2021 _____