



RF Exposure Analysis for Exemption from Extremity SAR Testing

FCC ID: ZDLST7

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:

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

- $f(\text{GHz})$ 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 5 XB (model: 3430016) 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) as defined in the Operation Description document.

SRD:

902MHz to 928MHz: -7.0dBm = 0.2mW

WLAN:

2412MHz to 2462MHz: +17.0dBm = 50mW

Cellular (2G, data only – EDGE Multislot Class 33):

GSM850: 824MHz to 849MHz: +28.0dBm max = 631mW

PCS1900: 1850MHz to 1910MHz: +27.0dBm max = 501mW

Cellular (3G.):

UMTS B5: 824MHz to 849MHz: +24dBm = 251mW

UMTS B2: 1850MHz to 1910MHz: +24dBm = 251mW

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 +24.0dBm = 251mW

There is no simultaneous transmission between the Cellular, WLAN and SDR radio functions of the Buddi Ltd. Smart Tag 5 XB (model: 3430016).

In accordance with KDB 447498 D01 v06, section 6.3 and KDB 865664 D02, section 2.4, as the Buddi Ltd. Smart Tag 5 XB (model: 3430016) 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 5 XB (model: 3430016) is subject to a duty factor 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:

$$(\{631\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{0.849 \text{ GHz}} = 0.256 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

4/. 2G PCS1900: 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:

$$(\{501\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{1.91 \text{ GHz}} = 0.305 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

5/. 3G B 5: 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:

$$(\{251\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{0.849 \text{ GHz}} = 0.102 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

6/. 3G B 2: 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:

$$(\{251\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{1.91 \text{ GHz}} = 0.153 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

7/. 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)

$$(\{251\text{mW} \times 0.0022\} / 5.0 \text{ mm}) \times \sqrt{1.91 \text{ GHz}} = 0.153 \text{ (i.e.: } \leq 7.5 \text{ for 10-g extremity SAR)}$$

Conclusion

The above calculations demonstrate that the Buddi Ltd. Smart Tag 5 XB (model: 3430016) meets the criteria for 10-g extremity SAR test exemption at a separation distance of 5mm.



Signature: _____ Date: 04/13/2023_____