



RF Exposure Considerations for AVEX Footbeat Engine

FCC ID: 2AKUY-100E

Analysis for FCC SAR Test Exemption

The FCC requires that the device meet the requirements of KDB 447498 D01 v06 Section 4.3.1 to be eligible for SAR test exclusion.

The AVEX Footbeat Engine is a portable device operating using a digital modulation transmission system in the 2400 to 2480MHz frequency band with a fixed antenna having an average gain of -0.5 dBi. Separation distance for normal operation is considered to be < 5mm.

The following FCC Rule Parts and procedures are applicable:

- Part 2.1093 – Radio frequency radiation exposure evaluation: portable devices
- Part 15.247(b)(3) – For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.
- Part 15.247(b)(4) – The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.
- KDB 447498 D01 *RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices*

SAR Exemption Basis

The following formula as given in KDB 447498 v06, section 4.3.1 is used to calculate if the device meets the FCC SAR exemption requirements. From section 4.3.1 (a),

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

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times [\sqrt{f_{(\text{GHz})}}] \leq 3.0$ 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 calculation
- The result is rounded to one decimal place for comparison"

Calculation

Max output conducted power: 0 dBm (1.0mW)

Considering the minimum antenna to person separation distance as \leq 5mm.

Frequency: 2400 MHz to 2480 MHz

Eq 1: $((1.0 \text{ mW} / 5\text{mm}) * \sqrt{2.480}) \leq 3.0$

Eq 2: $0.20 * 1.57 = 0.3152$

Eq 3: 0.3 \leq 3.0 limit for 1-g extremity SAR.

Conclusion

For portable device operation, the AVEX Footbeat Engine as designed fulfills the SAR exclusion conditions as detailed KDB 447498, Section 4.3.1, and as shown in Eq 1 thru Eq 3. SAR evaluation is not required for a separation distance of 5mm or more.

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