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To:
Federal Communications Commission
7435 Oakland Mills Road
Columbia, Maryland 21046
USA

RE: RF Exposure Evaluation of Sendum Wireless Corp. Model: OM500A, FCC ID: TS5-OM500A

The OM500A is a very low duty cycle digital transceiver used as an offender ankle bracelet (anklet). It has two transceivers, WLAN and LTE which do not simultaneously transmit. The LTE transmitter transmits on the following frequencies at the conducted power indicated:

LTE B4 (1710 – 1755MHz) – 0.216W
LTE B2 (1850 – 1910MHz) – 0.133
LTE B5 (824 – 849MHz) – 0.146W
LTE B12 (699 – 715MHz) – 0.160W

Under normal use, only the LTE transmits. The WLAN transceiver only receives beacon signals from another WLAN station. The only time it transmits is during a brief initial pairing and setup with the other WLAN station and is not worn on the ankle during that initial pairing and setup.

Once the initial pairing and setup are complete, under normal monitoring operation, the OM500 LTE transmitter opens a data session to the monitoring server no less than every 10 minutes (monitoring interval) and sends GPS coordinate and status data to the server. The total transmission time of each session is less than 2 seconds and the amount of data cannot be altered. This “hard coded” duty factor is:

$$2s/600s = 0.00333 \text{ (0.33\%)}$$

If the beacon signal goes undetected, the OM500A goes into a “Hyper Mode” and transmits a data session of less than 2 seconds every 30 seconds. This is the absolute worst case. This gives a duty factor of:

$$2s/30s = 0.0666 \text{ (6.67\%)}$$

The wearer has no control of any of the above duty factors. The monitoring service cannot increase the monitoring interval.

The OM500A is intended to be installed on the lower ankle of wearer, with the front of the device facing outwards, tight enough and in a manner that it cannot be relocated anywhere else on the leg or body of the wearer. It is not to be installed on the wrist, neck, around the body or as a pendant on the wearer. Figures E21.8 and E21.9 of Exhibit 21 – Photos - External show the location of the antennas with respect to the wearer. The minimum separation distance is 12mm for Antenna #1, the LTE Primary Antenna.

Using the worst-case duty factor and the maximum rated output power, including tune-up tolerance obtained from module datasheet, the following output power adjusted for duty factor is given as:

$$23dBm \pm 1dB = 24dBm = 0.251W \\ 0.251W \times 6.67\% = 0.0167W \text{ (16.7mW)}$$

Using the Standalone SAR Test Exclusion Threshold equation per KDB 447498 4.3.1a)

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] =$$

SAR Test Exclusion Calculations					
LTE Channel Band	Max Frequency (MHz)	Max Duty Cycle Power (W)	Separation Distance (mm)	Exclusion Value	10g Extremity Exclusion Limit
13	787	0.0167	12	1.23	7.5
4	1755	0.0167	12	1.84	7.5
2	1910	0.0167	12	1.92	7.5
5	849	0.0167	12	1.28	7.5
12	715	0.0167	12	1.18	7.5
Results:					Excluded

In the event that the front of the device should contact the wearer, such as possibly while sleeping, the separation distance between the antenna and the wearer would be greater than 8mm. Using the worst case from above and an 8mm separation distance:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] =$$

SAR Test Exclusion Calculations					
LTE Channel Band	Max Frequency (MHz)	Max Duty Cycle Power (W)	Separation Distance (mm)	Exclusion Value	10g Extremity Exclusion Limit
13	787	0.0167	8	1.85	7.5
4	1755	0.0167	8	2.77	7.5
2	1910	0.0167	8	2.88	7.5
5	849	0.0167	8	1.92	7.5
12	715	0.0167	8	1.77	7.5
Results:					Excluded

Note: Although the new requirements of §1.1307, §2.1091 and §2.1093 are now in effect, there is no guidance on determining the exclusion thresholds for Extremity-Worn devices other than what is currently publish in KDB 447498 D01 v06.

This device qualifies for Standalone SAR Test Exclusion per FCC KDB 447498 D01 v06. Should there be any questions or concerns, please feel free to contact me.

Sincerely,



Art Voss, P.Eng.