

From: Ming Yin

To: Leann Nguyen

Date: November 03, 2020

Subject: Request for Info - File # 0852-EX-CN-2020

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Message:

Additional Information in Coordinating with SAS

Comments from FCC:

With respect to CBRS frequencies 3550-3700 MHz, WTB/Mobility Division requests that the applicant revise its filing to include the following additional information: 1. Explanation of how it would coordinate any usage with a Spectrum Access System (SAS). 2. Explanation of How it would specifically avoid causing interference to incumbent and commercial operations in the band, including General Authorized Access (GAA).

1. Explanation of how it would coordinate any usage with a Spectrum Access System (SAS).
2. Explanation of How it would specifically avoid causing interference to incumbent and commercial operations in the band, including General Authorized Access (GAA).

Response:

We address the foregoing questions through the responses below:

Avoid interference to incumbent and commercial operations in the band including GAA.

- a. Our application is a short range ultra-low power wireless transmission for BMI (Brain Machine Interface) applications for use by patients with quadriplegia. The device is designed to transmit just a few meters, typically limited to a room in the residence.
- b. Our transmitter uses modulation scheme of OOK at 48Mbps rate. The frequency bandwidth needed is less than 100 MHz. Our transmitter carrier frequency is tunable between 3.2GHz to 3.8GHz. To avoid causing interference in the 3550-3700 MHz band, we will set the carrier frequency to be only in the range of 3.25 GHz to 3.5 GHz. This will provide operational frequency bands in 100MHz increments between 3.2GHz and 3.55GHz. Use of these frequencies reduces potential interference from/to any existing CBRS / SAS users in the locations.
- c. The measured transmitter power of our application is less than 1mW (0dBm) at the input of the transmitter antenna, which has a gain of 0dBi. According to measurements with a 10dBi receiving antenna, at 1 meter the total power is less than -35dBm across 1GHz bandwidth (Spectrum Analyzer measured peak is --40dBm). At 10 meters distance, the signal will be attenuated to around -88dBm (-92dBm Spectrum Analyzer peak). Considering the center frequency settings outside of the 3550-3700 MHz SAS band and the very low power, harmonics interference of this signal into the SAS band will be exceedingly small.

Coordinating any usage with a Spectrum Access System (SAS).

- a. Because we will be operating outside of the indicated band, we will be avoiding interference to incumbent and commercial operations in the band.