

From: Dina Katabi

To: Behnam Ghaffari

Date: December 07, 2014

Subject: FCC File No. 1056-EX-ST-2014

---

Message:

Correction: the device will transmit at 7uW average power.

In this exhibit, we justify our power levels based on:

- Our correspondence with the FCC OET (Inquiry tracking #223852)
- KDB 890966
- FCC Part 15.250

The device transmits an FMCW signal, which continuously sweeps between 5.95 GHz and 7.15 GHz. We consulted with the FCC OET (#223852) with respect to measuring the average and peak power associated with an FMCW signal for our application, and they referred us to KDB 890966. Hence, in what follows, we justify the device's emissions in accordance with KDB 890966.

- Bandwidth with the sweep turned off:

When the sweep is turned off, the device's emission consists of two narrow tones (each 1KHz wide) of equal power that are separated by 50MHz. Hence, the -10dB bandwidth of the signal is 50MHz.

- Peak Power:

The device transmits a 0.085mW signal that is divided between two subcarriers spaced by 50MHz from each other. For example, if the sweep is stopped at its center frequency of 6.55GHz, we obtain two tones: one at 6.549GHz and another one at 6.551GHz.

This is lower than the peak power requirement of 0dBm (1mW) of 15.250. Specifically, the peak power requirement with a RBW of 50MHz according to 15.250 is  $20 \log (RBW/50) = 0\text{dBm}$ .

- Average Power:

To calculate the average power, we follow the instructions for KDB 890966, which states that the average factor is computed as follows:

Average factor = (sweep freq. time/sweep span in MHz)/cycle time

Given that the device continuously sweeps from 5.95GHz to 7.15GHz, and repeats every 2.5ms, the average factor is:

Average factor =  $(2.5e-3/1200)/2.5e-3 = 1/1200$

Hence, the average power is:  $0.085\text{mW}/1200 = 7.083\text{uW}$ . This corresponds to a power of -41.5dBm, which is lower than the -41.3dBm average power threshold according to 15.250