

bitsensing Inc.

May 29, 2026

Subject: Request for Class II Permissive Change / Class III Permissive Change

FCC ID: 2AVBK-AFI920

IC: 25840-AFI920

Model / HVIN: AFI920

Original FVIN: SW2.3.0

New FVIN: v3.0.0-rc2-76fb3afb

To Whom It May Concern,

We, bitsensing Inc., hereby request a Class II Permissive Change under rules and a Class III Permissive Change under regulations for our certified FMCW radar device referenced above.

This application is submitted to address two modifications: a software-defined expansion of FMCW modulation modes via firmware update, and a minor hardware optimization involving the removal of a non-RF peripheral interface.

1. Description of Change:

- Firmware Update for FMCW Multi-Mode Activation: The newly proposed firmware version [v3.0.0-rc2-76fb3afb] activates multiple FMCW modulation profiles configuration, enabling Dual, SR (Short Range), MR (Medium Range), and LR (Long Range) operational modes. These radar profiles were already embedded within the internal MMIC chipset capabilities at the time of original certification but were factory-disabled via software.
- PCB Layout Modification: The PCIe interface circuitry, which is a non-RF peripheral part, has been completely removed from the board for hardware optimization and cost reduction. Concurrently, the PCB layout has been slightly modified to reflect the exclusion of this deleted part.

2. Technical Specifications of the Enabled FMCW Modes:

The newly activated firmware configures the FMCW radar sweep parameters as follows:

- Dual Mode: Supports simultaneous or interleaved short and long-range detection profiles.
 - * Frequency Range: [77.65 GHz ~ 79.75 GHz] / Bandwidth: 2.1 GHz
- SR (Short Range) Mode: Optimized for close-range resolution using a wider FMCW sweep bandwidth.
 - * Frequency Range: [77.65 GHz ~ 79.75 GHz] / Bandwidth: 2.1 GHz
- MR (Medium Range) Mode: Balanced configuration for mid-range detection.
 - * Frequency Range: [77.63 GHz ~ 79.58 GHz] / Bandwidth: 1.95 GHz
- LR (Long Range) Mode: Optimized for maximum distance detection using a narrower FMCW sweep bandwidth.
 - * Frequency Range: [77.8 GHz ~ 79.4 GHz] / Bandwidth: 1.6 GHz
- Maximum Output Power :
 - EIRP Peak : 35.18 dBm [36.44 dBm (Original certified power limit is not exceeded)]
 - EIRP Average : 10.40 dBm [11.35 dBm (Original certified power limit is not exceeded)]

3. Hardware Identity and Security Declaration:

- We officially declare that the removal of the PCIe interface part and the associated minor PCB layout changes do not affect the RF characteristics, MMIC circuitry, RF shielding, or millimeter-wave antenna traces of the device. The RF and radar front-end blocks remain completely identical to the originally certified equipment.
- The firmware update process is fully secured. The firmware is digitally signed and encrypted by bitsensing Inc. Final users do not have any access or user interfaces to modify the FMCW radar parameters, sweep limits, duty cycles, or output power settings.

4. Compliance and Test Evaluation:

The device has been thoroughly re-tested with the new firmware [v3.0.0-rc2-76fb3afb] installed at an accredited laboratory. All newly enabled RF modes fully comply with FCC and ISED RSS standards. Test reports demonstrating compliance for spurious emissions, occupied bandwidth, and RF exposure are enclosed with this application.

Except for the minor hardware optimization and the firmware-driven FMCW multi-mode activation described above, the device remains identical to the originally certified product.

Thank you for your time and attention to this matter.

Sincerely,

Signed:



Printed name: Suhan Kim

Title: Principal Research Engineer

Date: May 29, 2026