Internal & Partners

Request for Experimental license

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I. Background.:

Faurecia Clarion Electronics seeks OET approval for experimental license for an automotive radar. To be installed inside the vehicle cabin, the sensor uses millimeter wave (“mmwave”) technology and operates in the 57-64 GHZ band ruled by part 15.255 of FCC rules.

The device first goal is to overcome trauma for children alone in rear seats as indicated by the HOT CARS Act of 2017. This bill directs the Department of Transportation to issue a final rule to require that all new passenger motor vehicles weighing less than 10,000 pounds be equipped with a system for rear seating positions to alert (by an auditory and visual alert that may be combined with a haptic alert) the motor vehicle operator to check rear designated seating positions after the vehicle motor is deactivated.

II. Faurecia Clarion Electronics:

Faurecia Clarion Electronic North America, with its headquarters in Auburn Hills, Michigan, supports one of four business groups of Faurecia, one of the world's leading automotive technology companies. Faurecia Clarion Electronics is a key player in leading the automotive industry, it develops technologies based on advanced cockpit electronics and advanced driver assistance systems.

The company is engaged in the research, engineering, marketing and sales of audio, entertainment, navigation, and in-vehicle information solutions. The company also specializes in cloud connectivity and intelligent safety solutions for the automotive, recreational vehicle, commercial fleet and heavy industry environments.

As a top tier OEM partner to many automakers, Clarion has received numerous awards for design, innovation, support, manufacturing and product reliability. Clarion's mission is to bring advanced technologies and innovative high-quality products and solutions to users in order to help them enhance their quality of life through increased productivity, better entertainment, improved safety and access to always-on cloud-based systems.

III. Equipment description and use cases:

1. Device description:

The subject device is a millimeter wave radar sensor that operates in the 60-64 GHz band. It will have a maximum conducted power of -10 dBm, a maximum EIRP of +10 dBm and will operate with a maximum duty cycle of 10%. It will respect the radiofrequency radiation exposure limits with a power density lower than 1mw/cm² per 30 minutes.

The emission code is F3N and the frequency tolerance is 100ppm (2%).

The device will utilize 3 transmit ("TX") and 4 receive ("RX") antennas driven by a highly configurable FMCW transceiver with a 4-GHz continuous bandwidth.

The application of the sensor is focused to cover the inside cabin area with a maximum field of view of ± 75° for both azimuth and elevation angles.

In-vehicle radar modulation will consist of consecutive frames, including an acquisition sequence comprised by a repetition of frequency chirps or stepped chirps, a listening period, then a signal processing. The acquisition sequence is followed by idle time where antennas are not transmitting. The frequency chirps will span over the 60-64 GHz band and the duty cycle is designed to respect the power density limit as illustrated in the following diagram:

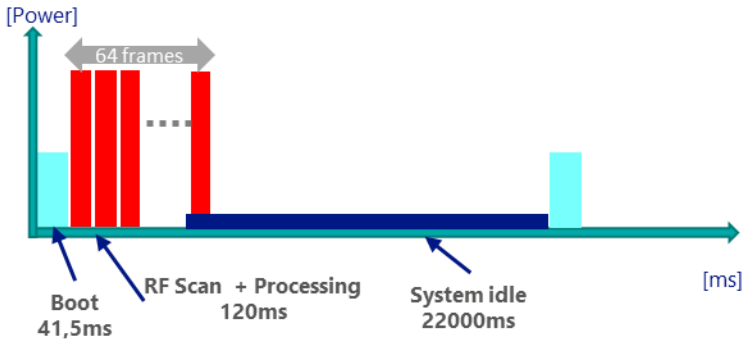

Figure 1 : Child Left Behind Detection 30 seconds cycle

2. Use cases:

i. Child Left Behind detection:

This in cabin radar has the capability of detecting children inside the cabin in extreme conditions, example: Toddler in the footwells or a toddler covered with a blanket and sleeping.

This feature will be activated when the vehicle is parked.

ii. Intrusion detection:

Detect intrusion to the vehicle while the vehicle is parked.

iii. Gesture Control:

The device will also be used for gesture control, the proximity of a user hand is used to control as specific in-cabin features.

This feature will be activated when the vehicle is parked.

IV. Conclusion

The described device will provide numerous safety and security benefits to vehicle occupants, without risking harmful interference to other spectrum users and strict compliance with 47 C.F.R. § 15.255 (c)(3) that regulates the power limits for “short-range devices for interactive motion sensing “. Public interest will be served by the safety and security features the device offers. Moreover, Faurecia Clarion Electronics kindly asks OET to treat this request on an expedited basis.