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Federal Communications Commission
Office of Engineering and Technology

Scope and Objective of FCC Test License Application for ARS4-C

a. The complete program of research and experimentation proposed including description of equipment and theory of operation.

The program constitutes the development of our 77 GHz automotive radar sensor ARS4-C for current applications like Adaptive Cruise Control, Forward Collision Warning and Emergency Brake Assist applications. The radar sensor is mounted on the front side of the car, either behind the bumper or behind the supplier's emblem in the front grille. The preceding generations of radar sensors, which are running in production vehicles on the market, operate in the same frequency band according to FCC part 15.253 and with the same radar principle and have valid FCC grants (OAYARS3-A, OAYARS3-B).

ARS4-C is a 77 GHz radar sensor with digital beam-forming scanning antenna which offers two scans for far and short range. It uses a pulse compression radar modulation scheme as basic principle for its measurements. The sensor has a field of view of $\pm 45^\circ$ in azimuth and a maximum range of about 200 m.

b. The specific objectives sought to be accomplished.

Our objective is to run vehicle system tests on the public roads and proving ground to validate and improve the new hardware, software detection algorithms and overall performance.

c. How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along line not already investigated.

Radar sensors are an integral part of advanced driver assistance systems. Several investigations by car manufacturers and insurance companies show the life saving potential of this technology.

Compared to the frequency range below 6 GHz (which is heavily used for WLAN and mobile telecommunication), the frequency range above 20 GHz remained mainly unused for consumer applications so far. Automotive radar is a key technology which makes efficient use of the 24 and 76-81 GHz bands.

Regarding the compliance of ARS4-C, the radar electromagnetic characteristics of ARS4-C have been investigated beforehand in our own laboratory and compliance to FCC part 95 is assumed. FCC testing in an accredited lab will follow in early 2019.

The road tests primarily focus on validation and tuning of detection algorithm, which does not impact radar emission.



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