

CAN Newsletter Online

ADVANCED DRIVER ASSISTANCE SYSTEMS

77-GHz radar sensor with two CAN FD interfaces

At the CES 2022, Texas Instruments (TI) presented its AWR2944 radar sensor. It can detect objects up to 40 % farther away from the vehicle.



The AWR2944 radar sensor is intended for ADAS (advanced driver assistance system) applications including blind-spot monitoring and turns-and-corner navigations (Source: Texas Instruments)

In an effort to move autonomous driving and vehicle safety forward, TI has announced an expansion of its automotive offerings that can help automakers improving how to sense objects. The AWR2944 radar sensor provides capabilities to detect quickly objects, to monitor blind spots, and to navigate turns and corners.

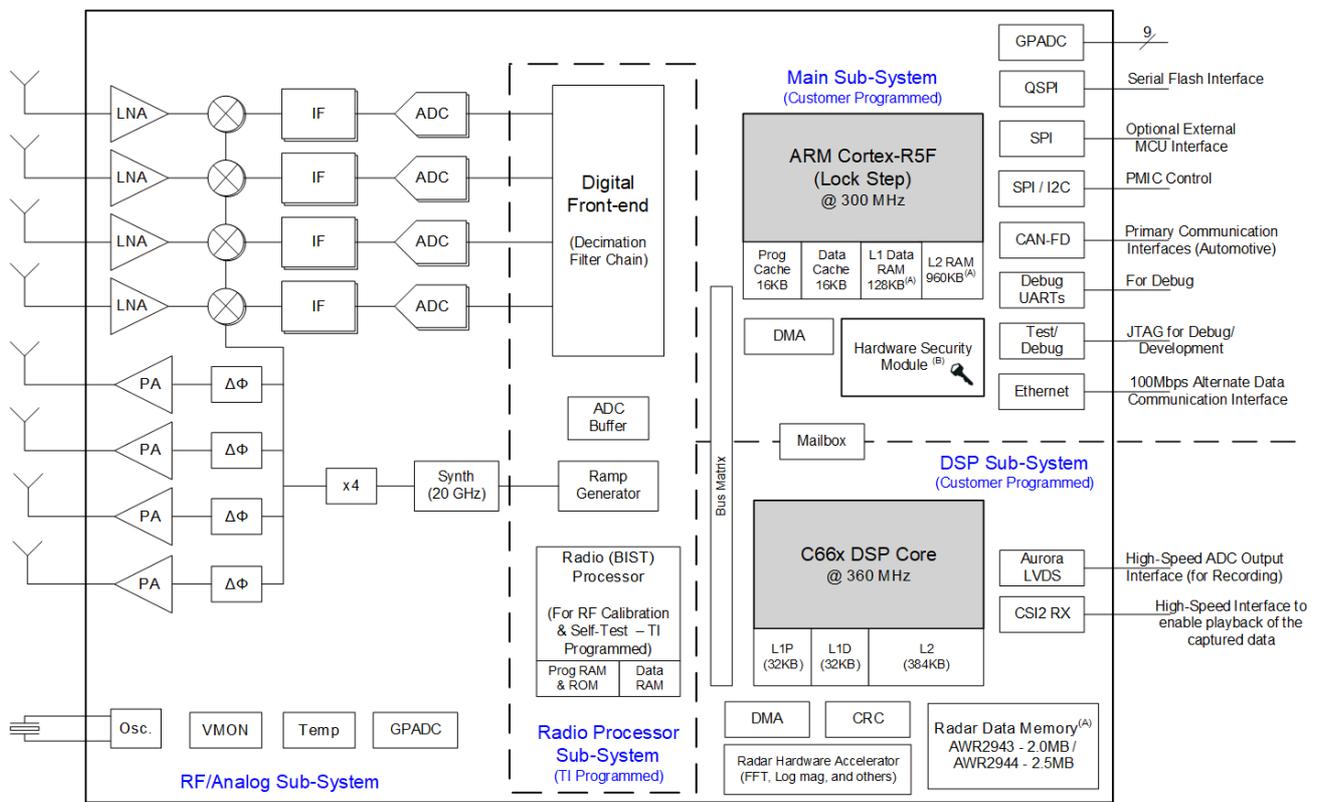
"Changing lanes and navigating tight corners present some of the most complex design challenges for our customers today," said Yariv Raveh, manager for TI millimeter-wave radars. "To create a safer driving experience, driver assistance systems must quickly and accurately process massive amounts of data and clearly communicate with the driver."

According to the U.S. Federal Highway Administration, more than 50 % of the combined total of fatal and injury crashes occur at or near intersections. With new motor vehicle safety requirements from U.N. Regulation No. 79 and updated New Car Assessment Program (NCAP) standards in effect, automakers must improve steering systems to support advanced driver assistance and automated driving functions.

The launched radar sensor can help automakers meet these safety regulations and provides radio frequency performance in a small form factor – according to TI approximately 30 % smaller compared to radar sensors today. The sensor integrates a fourth transmitter to provide 33 % higher resolution than existing radar sensors, enabling vehicles to detect obstacles more clearly and avoid collisions. In addition, the sensor's hardware supports signal processing based on Doppler division multiple access (DDMA). This improves the ability to sense oncoming vehicles at distances up to 40 % farther away. The sensor also features two ISO-compliant CAN FD on-chip controllers.

Empowering carmakers to develop vehicles with increased visibility of their surroundings, TI's solutions for ADAS include integrated system-on-chip radar sensors, edge artificial intelligence processors, and automotive-qualified power-management ICs (PMICs) such as the LP87745-Q1 low-noise, multi-rail PMIC for radar monolithic microwave processors.

"Visibility around corners has historically been challenging for autonomous and semiautonomous vehicles. This challenge presents the opportunity to design high-quality, premium ADAS technology that helps enhance vehicle perception," said Curt Moore, manager for the Jacinto processors. "For automated parking and driving, being able to see farther with devices like the AWR2944 sensor – and then seamlessly process that data with our Jacinto processors – leads to improved awareness and safety."



Block diagram of the AWR2944 sensor with four antennas and the MCAN core by Bosch featuring two CAN FD interfaces (Source: Texas Instruments)

Besides the two CAN FD interfaces, the ARM-based (Cortex R5F) sensor features also one Ethernet port and one I²C link. The operating temperature is specified for -40 °C to +140 °C. Cybersecurity is supported by means of a secure boot and software update function as well as a cryptographic acceleration. The automotive-rated radar sensor includes also a digital signal processor (C66x).

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