

4 GHz Automotive Radar Test

Safety and ADAS features like autonomous emergency braking (AEB) or rear cross traffic alert (RCTA) rely on radars to function properly. As automotive radars evolve to have 4 GHz of bandwidth, testing becomes more challenging, since more test coverage is needed for both parametric and simulation test. Additionally, the reliability needed calls for higher levels of accuracy and repeatability in the test system. At the same time, organizations cannot lose sight of future requirements like higher bandwidth sensors or different antennae designs.

Application Challenges

- Take parametric measurements and simulate radar obstacles for 77 GHz and 79 GHz with 1 GHz and 4 GHz bandwidths.
- Perform repeatable, accurate, and reliable testing to comply with OEM requirements for validation and production test.
- Integrate handling, actuation, and an anechoic chamber with the simulation and measurement instrumentation.

NI Solution

The 4 GHz Vehicle Radar Test System (VRTS) performs highly repeatable and accurate radar obstacle simulation and parametric measurements in parallel to reduce test time.

Affordable and easy to upgrade, NI-based radar test solutions are modular, flexible, and capable of addressing all validation and production test and measurement needs.

VRTS integration partners provide solutions leveraging NI RF test systems, including anechoic chambers, mechatronics, actuation, and software development.

The NI Advantage

- Reduce takt time, capital expenses, and footprint by performing parametric and simulation test in parallel for 77 GHz and 79 GHz automotive radars.
- Future-proof your investment with a modular solution that can be upgraded to add measurements, angles, and objects.
- Leverage work across design, validation, and production to speed implementation by using a single toolchain and API.

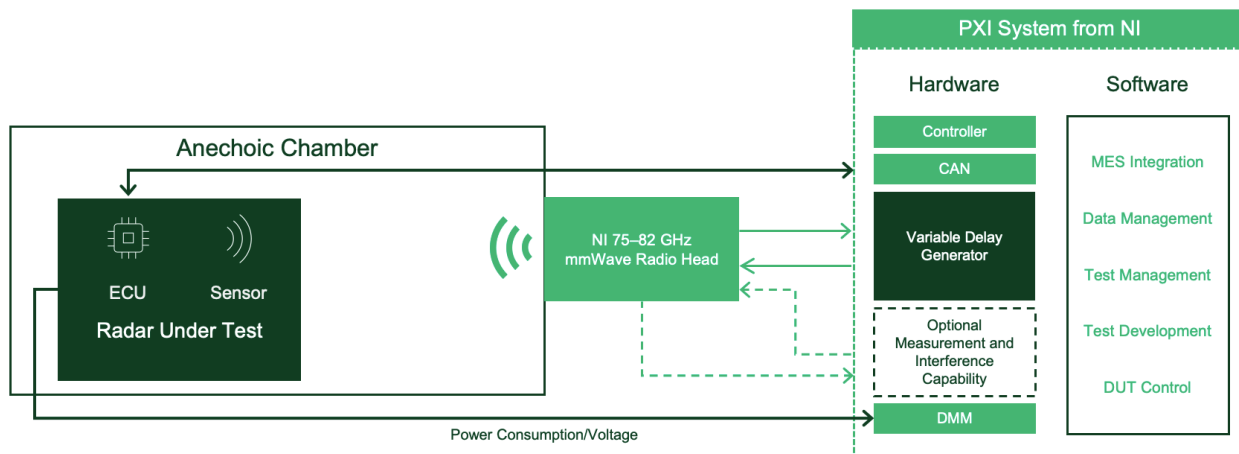


Figure 1. NI VRTS common configuration for production test



“NI's mmWave radar technology provides the industry's widest bandwidth and low latency software, which helps us develop automotive radar technology research in great depth. Through NI's flexible platform-based approach, we could finish both radar performance test and radar simulation, helping us accelerate the process of autonomous driving.”

Key Specifications

Frequency Range	75 to 82 GHz with 4 GHz instantaneous bandwidth
Object Distance	2.5 to 300 m excluding setup distance, 5 cm resolution
Object Velocity	0 to $\pm 500+$ km/hr with ± 0.05 km/hr accuracy
Radar Cross Section	50 dB dynamic range, with 0.25 dB resolution
Measurements	EIRP, phase noise, occupied bandwidth, radiation pattern, beam width, and chirp analysis



Figure 2. VRTS integration partners deliver standard and custom solutions based on NI's Vehicle Radar Test Systems, like the one shown above.

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of NI Partners to obtain a turnkey system.

To learn how you can increase product quality and shorten test timelines, contact your account manager or NI at (888) 280-7645 or info@ni.com.

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