

The background features a series of overlapping, semi-transparent circles of varying sizes, creating a layered, geometric effect. A thin, solid red horizontal line spans the width of the page, positioned below the main title.

ROOS INSTRUMENTS

Automotive Radar Test

# Welcome to the Future

## Adaptive Cruise Control, Collision Avoidance, Automated Cars

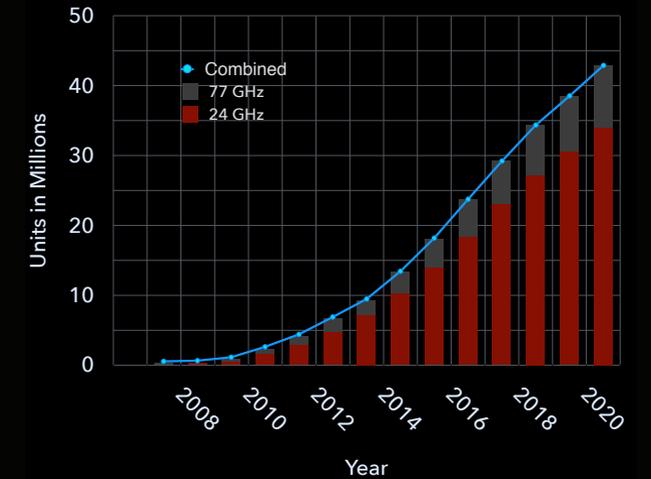
The future of the automobile hinges on the technology of advanced radar sensors. Vehicles that can see through darkness and fog, track other vehicles in front and behind up to several hundred meters, and brake on their own. The advanced driver assistance system (ADAS) is driving the evolution of automotive radar from luxury option to standard safety feature for all of the cars on the road. As this technology becomes more integral, it promises to ultimately make cars smarter, safer, and to help usher in the era of the intelligent vehicle.

77GHz radar with multi-mode beam forming enables long-range tracking for adaptive cruise control and mid-range sensing for collision warning and avoidance

Rear-facing 77GHz radar supports collision detection and pre-crash warning systems

24GHz short-range radar provides advanced proximity sensing for blind-spot detection of cars and pedestrians.

### Radar Forecast



The potential of the automotive radar market is poised to set off a technology race into the ultra-high frequency spectrum. Current projections point to business growth surpassing \$1.3B in 2017 with significant gains as radar moves from high-end to mid-level cars.

# Into A New Frontier

# The Next Generation of Test

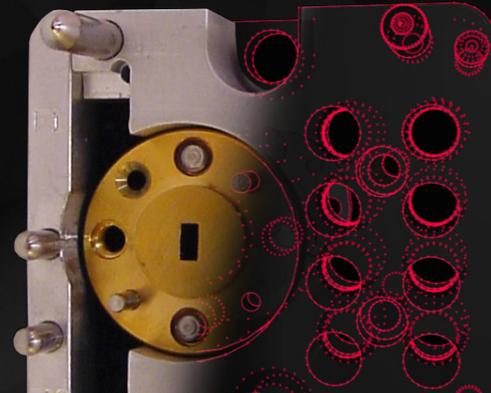
24GHz

77GHz

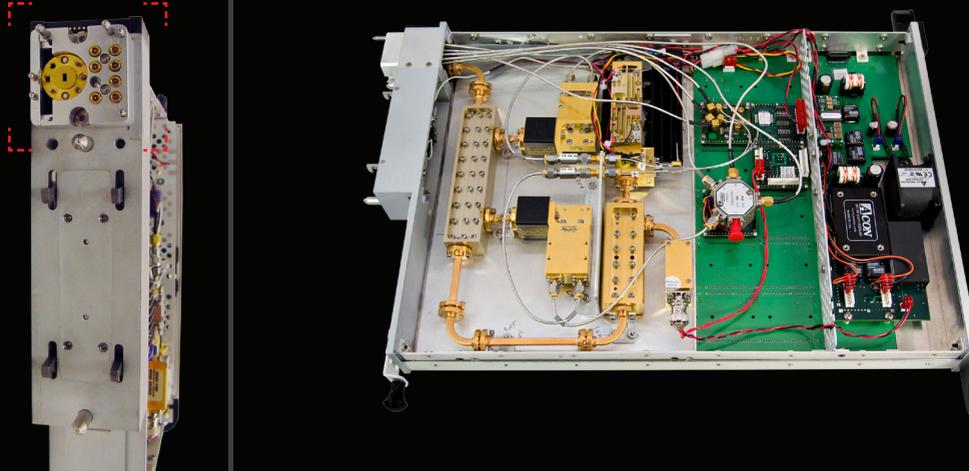
Wavelengths that approach feature size, optical-like wave propagation, and exotic waveguide interconnect. Welcome to the world of extremely high frequency test.

For over 25 years, Roos Instruments has designed and engineered ATE that put microwave test at the center of focus. Not bolt-on RF, or add-on capability, but integrated RF instrumentation that combine the accuracy and precision of bench equipment with the speed and repeatability of production ATE. We design instruments that don't just meet the requirements of automotive radar test, they exceed them.

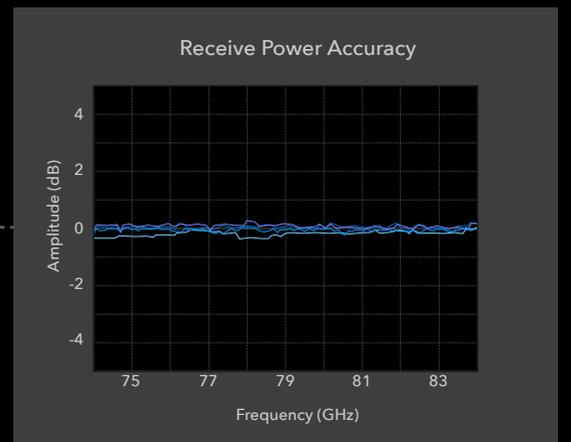
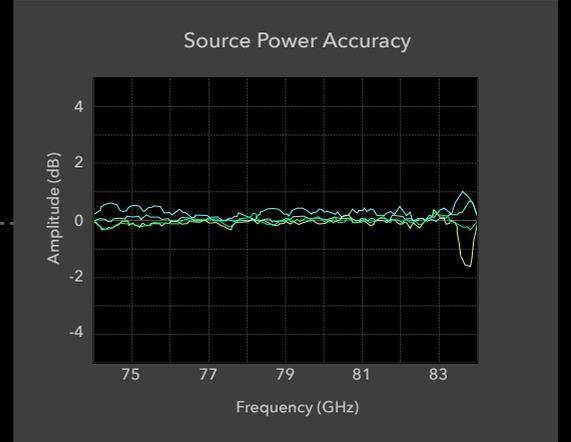
We've created the industry's first blind-mate waveguide and coaxial interface system designed specifically for ATE using military-grade components to ensure precision and reliability,



Test Instrument Modules (TIMs) put all of the components and functionality for 24GHz and 77 GHz applications into standard, application-specific instruments. The design supports flexible resource sharing schemes and multi-site port expansion while providing easier field-servicing.

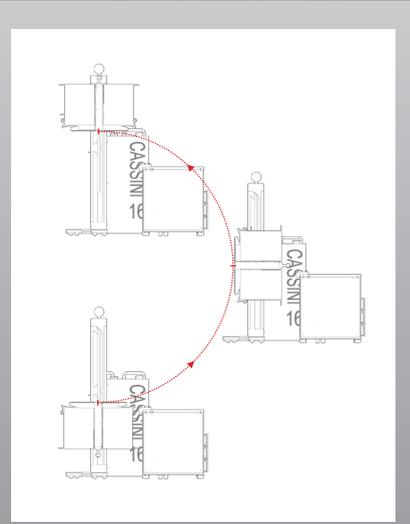


The RI8564 Test Set provides a complete millimeter wave test solution for the 75 GHz to 81 GHz range. Integrated waveguide port conversion and our unique vector RF architecture provide phase and magnitude error correction for source and receive measurements with the highest accuracy of any ATE on the market.



# Configured to Specification

Cassini's configurable instrument architecture combines the performance of a lean, focused tester with the versatility and cost-effectiveness of a modular test system. The system can be completely customized to meet the needs of any radar sensor application be it 24GHz or 77GHz, device characterization, wafer probing, multi-site package test, or system-level module test.



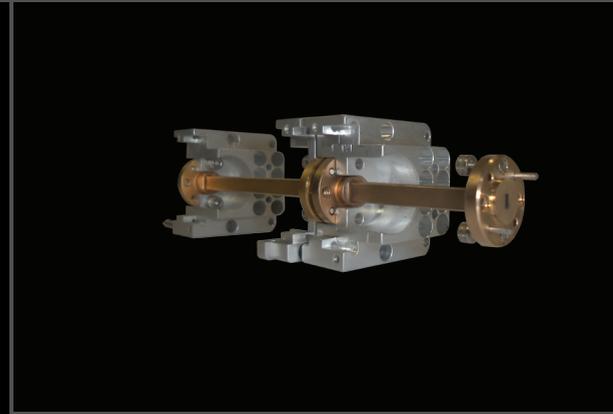
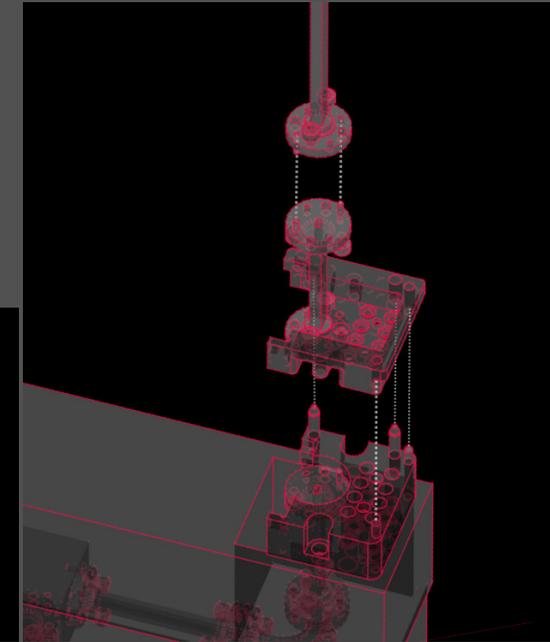
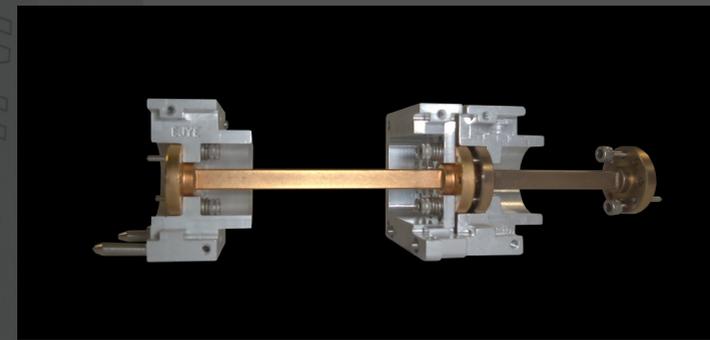
Cassini's testhead provides universal instrument slots and an electro-mechanical armature to provide a production workbench that can adapt to current and future radar test requirements.

## 0.1mm

It's the width of a grain of sand, the thickness of a sheet of paper, and the difference between delivering 100% signal power at the device, or less than half of it.

Extremely high frequency test requires not just a different type of instrument and interconnect, but a different mindset. It takes a desire to make things work well, and to truly understand how to make things work well with precision mechanics and an attention to detail. We found the solution to a millimeter wave test system that is both accurate and reliable in production is in getting the small things right. And in this endeavor, 'close enough' will not do.

Precision surface tooling and keyed-guide pins ensure consistent planarity and alignment of waveguide ports between instruments and device interconnect.

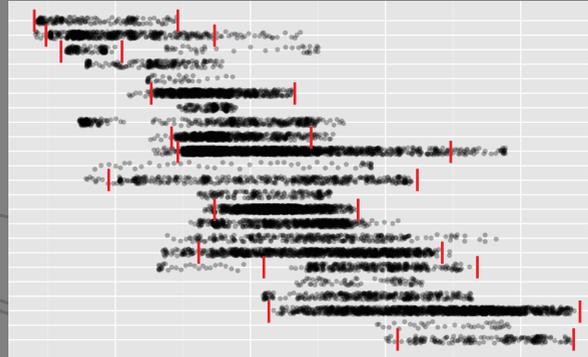


The interconnect system provides better access to resources during development and makes for a serviceable test bench on the production floor.

# Finding the Signals in the Noise

Reliable Measurements, True Accuracy, Actionable Data

It's not enough to validate a passing radar part, it's how each part passes that can determine the reliability and longevity of these devices when they are deployed in the field. With Cassini, we give you all of the tools for front-end test and back-end analysis to ensure the tightest specifications and highest standards of your radar devices.



Built-in adaptive limits and statistical tools let you validate the quality of radar devices across multi-dimensional test data.



Cassini is the first ATE system with native support for Rich Interactive Test Database (RITdb). RITdb takes the best of standard test data formats and puts it into an extensible database to support modern enterprise data solutions.

- Access Test Data Seconds after it's Logged.
- Extend Data with Handler Information, Tester Setup, and Report Logs.
- Analyze, Collaborate, and Share Data All within a Secure SQL Database.

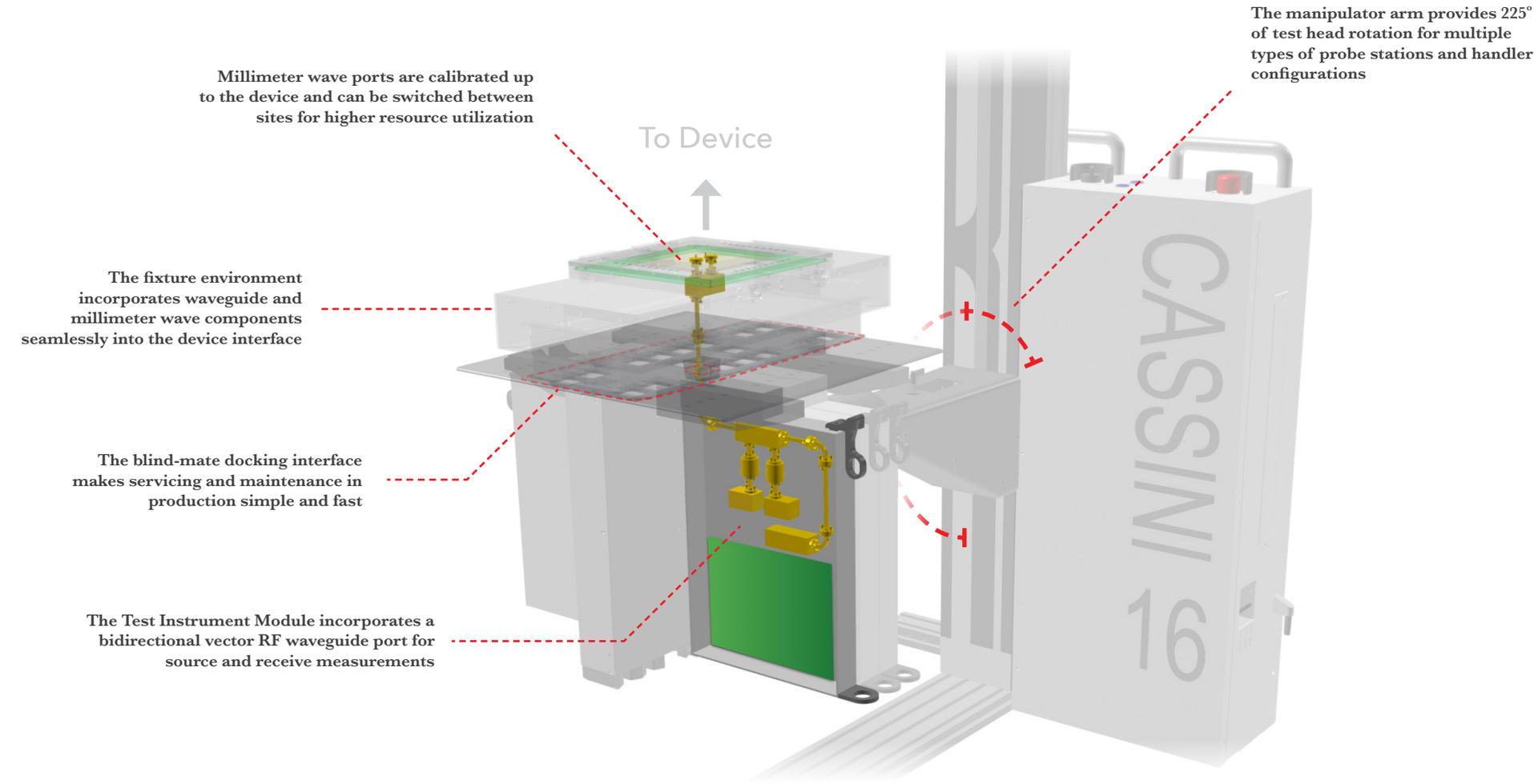
# Managing Mission Critical

A global supply chain means the management of personnel, test equipment, and resources spread over several continents and time zones. Cassini comes standard with the enterprise software to give you absolute control over your deployed test systems anywhere in the world. Because when you are equipped with the right tools to manage production test logistics, you can put the focus back on what's important.

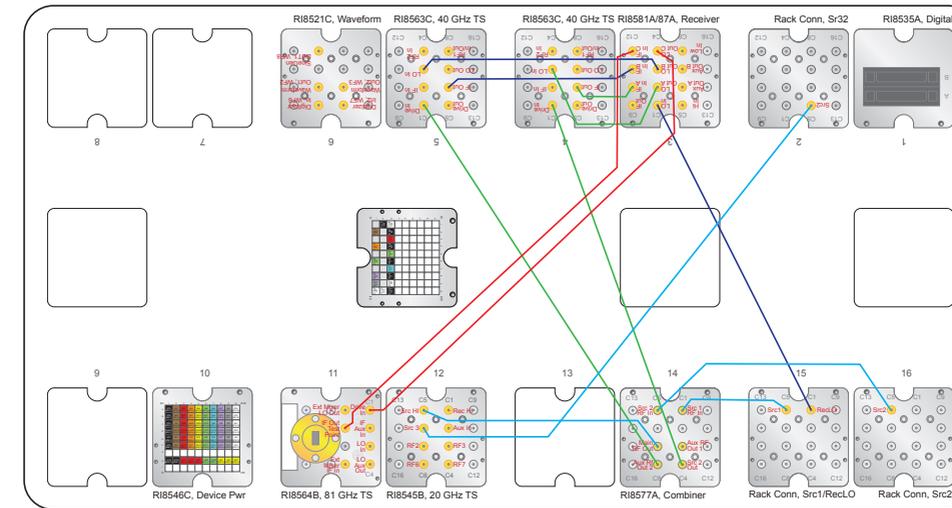
- Software Release Synchronization
- System Configuration Control
- Locked Software Environments
- Built-in Revision Control
- Automated Backups
- Access Control



# Production Millimeter Wave



## Test Head Configuration



Configurable interconnect between Test Instrument Modules (TIMs) synthesize instruments specific to radar test such as vector network analyzers, oscilloscopes, spectrum analyzers, frequency up/down converters, signal combination, carrier modulation, and phase-locked receiver/transmitter systems.

### Measurements

- Continuity | Leakage
- SCAN | I<sup>2</sup>C | SPI | JTAG
- RF Power Measure
- Multi-Port S-Parameters
- Adjacent Channel Leakage (ACLR)
- Intermodulation Distortion (IMD)
- Third-Order Intercept (TOI)
- Power Compression (IP3)
- Modulation: EVM, PAR

CASSINI 16



Shown with optional auxiliary rack/workstation

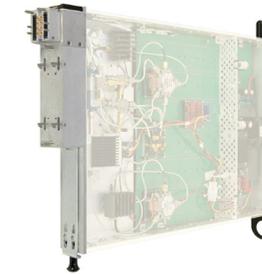
Cassini test systems provide a versatile, automated test solution for mixed-signal, RF, and microwave applications with the highest in-class RF performance for consumer and industrial-grade devices. Utilizing a completely modular architecture, the flexible hardware and scalable software combine with 25 years of test system integration to deliver seamless multi-functional and multi-instrument test that can be scaled efficiently across the widest frequency range of any ATE.

Features

- 16 Universal Instrument Slots
- Integrated Device Interface Environment
- Support for Handler & Prober Docking
- Graphical Programming Environment
- Enterprise Data Management System
- Touchscreen Operator Controls

RI8563

RI8564



The RI8563 Test Set provides the industry's most versatile multi-port microwave instrument for 24GHz ultra-wideband radar applications. Designed to interface with a Cassini receiver and source, the RI8563 provides a dedicated high frequency input port and bi-directional microwave port for signal power/phase source and measure, bilateral s-parameters, distortion test, and harmonic measure. An LO input port along with IF input and output ports and internal RF switching enable full loopback transmit/receive measurements and signal routing flexibility for maximum channel utilization and fast, precision measurements.

The RI8564 Test Set extends the application range of Cassini with a bi-directional, high-frequency waveguide port and supplemental RF I/O for the 75 - 81 GHz band. With a built-in noise source, frequency translation, and signal conditioning, the RI8564 is the premier 77 GHz radar test instrument. Calibrated signal sourcing and RF vector measurement capability provide signal power and phase, s-parameters, harmonic measurement, noise, and distortion test. Designed to integrate with a Cassini source and receiver, the instrument provides an IF output and LO port for synchronous multi-instrument Tx/Rx measurements. With an integrated waveguide interface and interconnect system, the RI8564 provides a complete, scalable millimeter-wave radar test solution.

	Source	RI8563	RI8564
Source	Frequency Range	4 GHz to 40.5GHz	75 GHz to 81 GHz
	Resolution	2 Hz Steps	4 Hz Steps
	Power Range	-25 dBm to +3 dBm	-20 dBm to +5 dBm
	Accuracy	± 0.1 dB	± 0.4 dB
Receive	Frequency Range	4 GHz to 40.5GHz	75 GHz to 81 GHz
	Power Range	-115 dBm to +20 dBm	-100 dBm to +10 dBm



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