

INTRODUCTION

The RayOne M400 OTA (Over-the-Air) test system is highly suitable to perform transceiver tests for 5G wireless UE and mmWave radar. It has a compact size, large quiet zone, and is an all-in-one mmWave test solution. The RayOne M400 provides a complete solution that can act both as a “test platform and test system.”

This is a general software platform and cloud service platform for R&D applications. Engineers can verify a DUT's OTA performance and perform signal processing and algorithm tests according to user requirements.

This system supports many functions: arbitrary vector signal generation(VSG), arbitrary vector signal analysis(VSA), spectrum analysis, and S21 amplitude/phase measurement. It also can be upgraded to perform mmWave radar/module phase and amplitude calibration and target simulation.

The software platform provides a convenient development method that enables the platform to run user-defined tests.

HIGHLY INTEGRATED SYSTEM

This system integrates a mmWave chamber with a test module, a RF interface unit, and a controller. The entire system architecture is simple to understand and use.

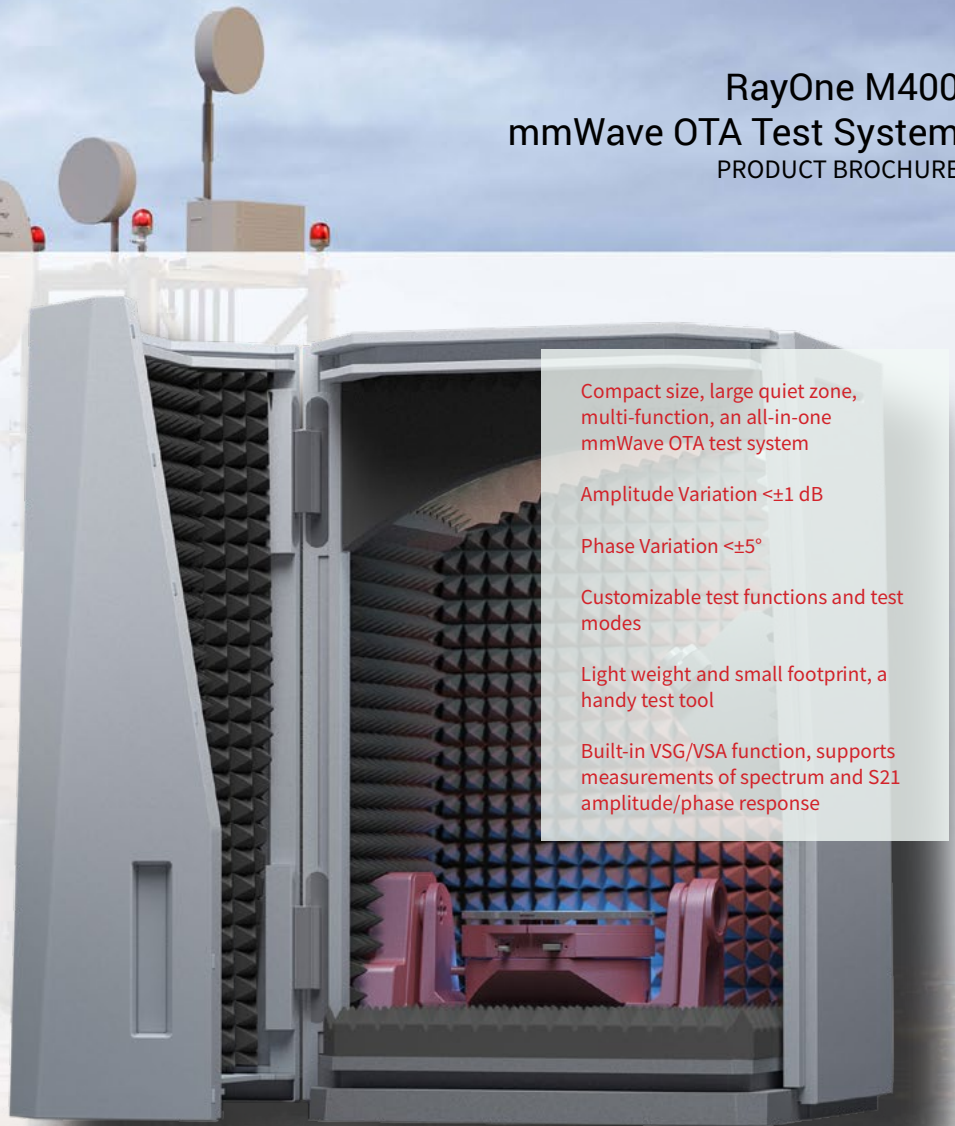
It can cover passive tests, active tests, and RF tests (with built-in instruments). In the future, the system will also support mmWave phase/amplitude calibration and radar target simulations.

RayOne fully covers a mmWave device's test requirements from antenna design, whole device R&D, manufacturing, and hardware repair. It is a mmWave engineer's handy test tool for UE debugging and performance verification.

Meanwhile, the integrated design ensures high system test accuracy that delivers results that are superior to the conventional “chamber + instrument” model.

PATENTED CATR REFLECTOR + ABSORBER DESIGN

RayOne's CATR reflector is seamlessly surrounded by absorbers; such a design improves the quiet zone quality. Its amplitude variation is $\leq \pm 1$ dB and phase variation is $\leq \pm 5^\circ$.



Compact size, large quiet zone, multi-function, an all-in-one mmWave OTA test system

Amplitude Variation $\leq \pm 1$ dB

Phase Variation $\leq \pm 5^\circ$

Customizable test functions and test modes

Light weight and small footprint, a handy test tool

Built-in VSG/VSA function, supports measurements of spectrum and S21 amplitude/phase response

FLEXIBLE CONFIGURATION

The test function configuration process is flexible. Different users or different applications can utilize particular test functions such as passive tests, active tests, RF tests, amplitude/phase calibrations, and target simulations.

Customers can select one or multiple test functions for the system to help save on costs and to eliminate system redundancy.

COST-EFFECTIVE

The built-in test module provides general-purpose, high-performance test functions such as basic VSA, VNA, and VSG tests. Eliminating unneeded test functions decreases test equipment costs. RayOne is an all-in-one solution that is more cost-effective than conventional mmWave OTA systems.

COMPACT SIZE, VERSATILE TOOL

With a small footprint, RayOne weighs less than 80kg, allowing engineers to carry out debugging and verification tests in small spaces.

MAXSIGN: FAST PROFESSIONAL MANUFACTURING OTA TEST

The MaxSign100 system control and test automation software is based on the .NET Framework 4.0 platform. It fully complies with CTIA test standards and is in conformance with the latest specifications. Offering an easy-to-use GUI, MaxSign100 supports a wide range of applications, flexible configurations, test processes, and stable operations. It can meet different test requirements at different stages of the product development cycle, providing test coverage that ranges from R&D, pre-certification, conformance, QA, and manufacturing.

- 3D measurements, cut selectable 2D measurements, and single-point measurements
- User-defined test step, test angle, and test configuration
- Arbitrary selection of test points to review all test data of it
- Wide variety of test assistant functions, such as anti-drop-call, auto-recall, and abnormal situation warnings. Improves the testing processes' reliability and fluency
- Comprehensive raw test data and log files management. Traceable and nonmodifiable test process
- Batch processing function supports creating task lists for continuous and automated unattended tests
- Resourceful built-in templates, preconfigured parameters compatible with different instruments and test platforms. Simple manipulations effectively prevent operational errors
- Supports 3D display, antenna pattern arbitrary angle rotation, viewing, and cutting to help R&D engineers visually analyze and diagnose problems

RAYONE M400 FUNCTIONS		
FUNCTION	TEST CASE	DESCRIPTION
Passive Test	Antenna pattern for 3/4 hemisphere	S21 amplitude & phase response
Active non-signaling test	Tx Test	Transmission Antenna Pattern, TRP, 3D beam scan, signal quality (frequency error, spherical coverage, LO leakage, EVM) Spectrum analysis (OBW, SEM, ACLR, etc. Note: Tx signal can be a user-defined arbitrary wave
	Rx Test	Rx power level, Rx sensitivity (DUT supports demodulation) Note: Receive arbitrary signal from DUT, then send data to PC for data/algorithm analysis
RF Test	Spectrum analyze	Observe signal spectrum
	Network analyze	S21 amplitude/phase response
	Time domain analyze	Analyze time-domain signal from DUT
Others	Phased-array antenna amplitude/phase calibration. Radar calibration, radar target simulation	Upgradable



CONFIGURATION & ORDERING

Shielding Enclosure	Includes shielding box, door, reflector, feed, power supply, cables, positioner and controller etc.
Baseband Test Module	ODC200 VSG/VSA for baseband-signal generation, analysis and processing
mmWave Frequency Converter	mmWave header, converts signal frequency between 24G~43.5GHz to IF
mmWave Switch	1-to-2 RF switch, change the signal channel for different test directions

SERVICE & SUPPORT

System calibration	One free calibration at system delivery
Warranty	Free for the first year
Software upgrade	Free for the first year

SPECIFICATIONS

Frequency (GHz)	24-43.5
Shielding (dB)	70
Weight (kg)	< 100
Power (W)	100-200 typical
Positioner	Phi: 0-330 Theta: -135°-135°
Quiet Zone(mm)	200×200×200
QZ Amplitude Variation	< ±1
QZ phase Variation	< ±5°
Dimensions (mm)	620×945×705 (w×h×d)
Max. DUT size (mm)	200×200×200 (w×h×d)
Max. DUT weight (kg)	< 5
Passive test accuracy (dB)	< 1
TRP Accuracy (dB)	< 1
Repeatability (dB)	< 0.5



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