DATA SHEET

F9650A Compact Antenna Test Range

Millimeter-Wave Over-The-Air Measurement Chamber

KEYSIGHT TECHNOLOGIES

Overview

The Keysight F9650A Over-The-Air (OTA) Compact Antenna Test Range (CATR) chamber provides a measurement environment for characterizing wireless and antenna system performance of devices at millimeter-wave (mmWave) frequencies. Use the chamber with Keysight test and measurement equipment in a range of applications including device R&D and 3rd Generation Partnership Project (3GPP)/Cellular Telecommunications Industry Association (CTIA) conformance test.

Key Features

- Compact antenna test range (CATR)
  - Shielded anechoic chamber with a rolled-edge reflector
  - Roll-over-azimuth positioner
- Controller for feed and device under test (DUT) positioners with triggered data acquisition capability
- Probe feed options for in-band and spurious test frequency ranges
- Optional calibration kits for chamber validation and calibration
- LED lighting and camera
- Lasers for DUT alignment
- Support for hand and head phantoms
- Frequency range 1 (FR1) antenna and/or frequency range 2 (FR2) link antenna options
- Support for extreme temperature condition (ETC) testing
- Chamber control software
- 2D/3D plotting software option
- OTA chamber Test Automation Platform TAP plugins for the following Keysight equipment:
  - N9040B UXA signal analyzer (50 GHz)
  - N5244/5/7B PNA-X microwave network analyzer (43.5/50/67 GHz)

Applications

- Antenna characterization
- Signaling and non-signaling device characterization
- Used with Keysight S8705A RF/RRM DVT & Conformance Toolset for:
  - RF design verification test
  - RF conformance test, in-band and spurious
  - UE radio resource management (RRM), 1 angle of arrival (AoA)
  - UE RF demodulation
- Used with Keysight S8707A RF/RRM Carrier Acceptance Toolset for RF carrier acceptance test
- RF testing under extreme temperature condition (ETC) (with temperature control option)

System Specifications

Chamber Anechoic Enclosure

Description	Specification (nominal)	Supplemental information
Construction	Not applicable	Aluminum frame and panels
Size (length x width x height)	2.8 m x 1.6 m x 2.0 m	
Weight	585 kg (1290 lbs)	
Anechoic treatment	120-mm pyramidal anechoic foam	
Supported frequency range	6-110 GHz	
Isolation	>70 dB (typical) >75dB (nominal)	600 MHz-7.125 GHz 24-42 GHz

Reflector

Description	Specification (nominal)	Supplemental information
Frequency range	6-110 GHz	
Focal length	1.02 m	
Edge treatment	Rolled edge	

30 cm Quiet Zone for FR2

Description	Specification (nominal)	Supplemental information
Quiet zone (QZ) dimensions	30 cm diameter	
Cross polarization	-30 dB	
Amplitude taper	1 dB	
Amplitude ripple	± 0.5 dB	
Phase variation	10° at 28 GHz 17° at 39 GHz	Varies with frequency
Path loss	61.5 dB at 28 GHz 64.4 dB at 39 GHz	Free space path loss

DUT Positioner

Description	Specification (nominal)	Supplemental information
Roll over azimuth	Roll range: ± 180° Azimuth range: ± 165°	
Resolution Accuracy Speed	Roll/azimuth: 0.01° Roll/azimuth: 0.1° Roll: 40 deg/sec Azimuth: 20 deg/sec	
Max DUT weight	4.5 kg (10 lbs) 2.0 Nm max torque	On roll axis Torque = mass x (distance from roll axis to center of DUT mass) *For higher torque options contact your Keysight representative*
Communications	USB 3.0	
Power requirements	110 V/220 V AC	320 W input power

24-42 GHz Feed Antenna (In-Band)

Description	Specification (nominal)	Supplemental information
Type	Corrugated dual-polarized horn	
E-H plane symmetry	~3 degrees	
Gain	15 dBi	Gain vs frequency plot provided on request
Cable loss (to bulkhead)	~5 dB	Varies with frequency
Feed roll	-90° to 180°	

Accessories and Options

Option	Description
Positioner	
F9630A-PG1	Positioner system: roll-over-azimuth, standard torque, 30-cm QZ
Antennas and probes	
F9630A-AG1	FR1 link antenna/mounts/cables
F9630A-AH1	FR2 link antenna/mount/cables
F9630A-AJ1	Dual polarization probe/fixture/cables, 24 to 42 GHz, 30-cm QZ
F9630A-AK1	Out-of-band spurious probes/fixture/cables, 6 to 110 GHz, 30-cm QZ

Calibration kits

F9630A-BG1	Cal kit, in band measurements (24 to 42 GHz)
F9630A-BH1	Cal kit, spurious measurements (6 to 110 GHz), with U9361M-5CX
U9361M-5CX	RCal receiver calibrator, 1.0 mm, 10 MHz to 110 GHz

Cables

F9630A-CA2	RF cable M-M 1.85 mm, 24 in (61 cm)
F9630A-CA4	RF cable M-M 1.85 mm, 48 in (122 cm)

Amplifiers

F9630A-M01	Routing IF/RF amplifier unit, 24 to 40 GHz for non-signaling
F9630A-M02	Integrated PA-LNA switch module kit, 24-42 GHz for signaling

Thermal (ETC)

F9631A	Temperature control unit -10 to +55 °C
F9631A-TA1	DUT temperature enclosure kit A

Miscellaneous

F9630A-MB1	Chamber security bracket kit

Software

F9629001A	OTA Chamber control software
F9629020A	OTA 3D Viewer software
F9629030A	OTA VNA control software (requires KS8400A TAP)
F9629031A	OTA signal analyzer control (requires KS8400A TAP)
F9629040A	OTA temperature control software

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