Spherical Near-Field Antenna Measurements

Keysight Technologies and NSI

Characterize your antennas completely with spherical near-field measurements

Spherical near-field measurements allow the complete characterization of antenna designs. By sampling data on a spherical surface surrounding the antenna-under-test you can assess the performance of your antenna under its real operating conditions.

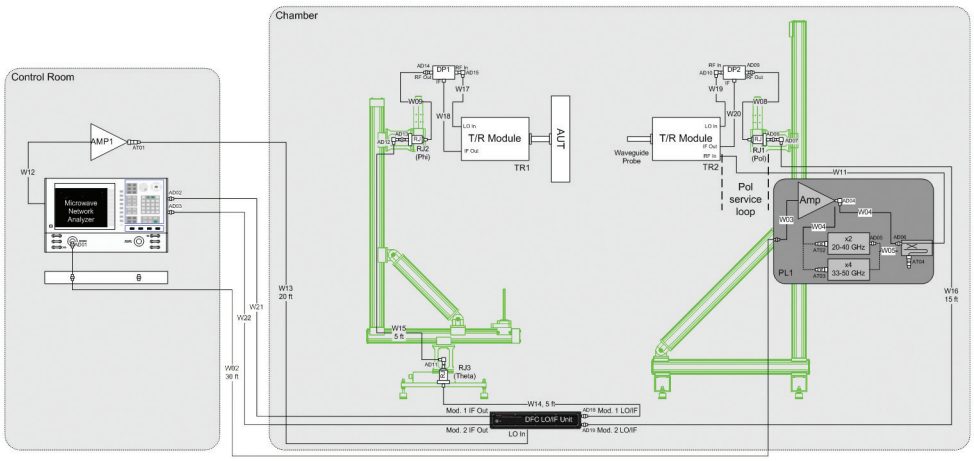
To perform the near-field measurements the antenna-under-test is rotated in two axes while a fixed probe measures the field data over the spherical surface. By rotating the antenna in both the theta and phi axes the antenna performance can be characterized rapidly, accurately and comprehensively.

The 700S-30 spherical near-field scanner from Nearfield Systems Inc. (NSI) provides the mechanism for positioning accurately both the antenna and the test probe while performing the measurements. The 700S-30 uses a dual axis phi-over-theta high accuracy stepper motor to position the antenna-under-test. It allows full spherical 360° phi/theta rotation of the antenna, with a resolution of 0.0125° in both axes and a rotational speed of 20° per second.

The scanner is constructed of modular high strength aluminum and supports loads of up to 40 pounds (18 Kg). The system can be used to measure medium and low gain antennas up to 20 inches (0.5 m) in diameter. The locations of the probe, theta and phi stages are fully adjustable and the system can be dismantled quickly for transportation or storage.

In order to measure the antenna performance the 700S-30 can be interfaced to a variety of RF and microwave test equipment including the Keysight PNA Series of microwave network analyzers. The PNA Series provides industry-leading performance for antenna testing with high accuracy, reliability, and productivity.

- Small spherical near-field scanners for complete antenna characterization
- Positions the antenna-under-test and probe for accurate measurements
- High accuracy, dual axis, phi-over-theta stepper motor for positioning
- Allows full spherical 360° phi/theta rotation at 20° per second
- Modular high strength aluminum construction supports up to 40 Kg
- Software allows automatic set-up based on measurement parameters
- Used with Keysight PNA network analyzers



KEYSIGHT TECHNOLOGIES

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The software provided with the 700S-30 allows the automatic set-up of scans based on measurement parameters and desired outputs. The measured data can be processed for far-field or holographic patterns giving complete characterization of antenna performance. A single data set can provide information on antenna gain, side lobe structure, beam pointing and cross polarization.

With the 700S-30 spherical near-field scanner interfaced to a Keysight PNA you can characterize your antenna design accurately and completely

Near-Field Measurements

With its accuracy, throughput, lower cost, and diagnostics, near-field antenna testing is now the preferred approach for characterizing antennas. There are three test configurations available for near-field measurements: planar, cylindrical and spherical.

In planar testing, the antenna is stationary and the near-field probe is moved along a planar surface in both the horizontal and vertical direction so that a grid of field samples can be taken. In the cylindrical configuration, the antenna is mounted on a single axis rotator and the probe is moved along a line parallel to the axis of rotation. By rotating the antenna and moving the probe in the vertical direction a cylindrical surface is described and a grid of samples can be taken along the azimuth and elevation.

The spherical configuration provides the most comprehensive set of measurement results for characterizing an antenna. The antenna is mounted on a dual axis rotator with the near-field probe kept stationery as the antenna is rotated through 360° in both phi and theta directions. It is also possible to make spherical measurements by keeping the antenna stationary and rotating the probe in order to describe the spherical surface.

Nearfield Systems Inc. provides systems to support all variations of near-field antenna measurements, planar, cylindrical and spherical.

System Components

Keysight Technologies

PNA Series	Microwave network analyzer
ENA Series	Vector network analyzer

Nearfield Systems Inc.

700S-30	Spherical near-field measurement system

To learn how this solution can address your specific needs please contact Keysight's solutions partner, Nearfield Systems Inc.
www.keysight.com/find/nsi

NSI

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Extending our solutions to meet your needs

Keysight and its Solutions Partners work together to help customers meet their unique challenges, in design, manufacturing, installation or support. To learn more about the program, our partners and solutions go to
www.keysight.com/find/solutionspartner

Nearfield Systems Inc. (NSI) is a high technology company that manufactures scanners, instrumentation and software to measure the RF performance characteristics of microwave radio antennas.
www.nearfield.com

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