



RESEARCH ENVIRONMENT

FACILITY

The Wireless Communication and Electromagnetic Compatibility Research Center at National Taiwan University of Science and Technology has advanced and comprehensive antenna measurement systems, including the Spherical Near-Field Antenna Measurement Anechoic Chamber, Far-Field Antenna Measurement Anechoic Chamber, Planar/Cylindrical Near-Field Antenna Measurement Anechoic Chamber, Electromagnetic Compatibility Semi-Anechoic Chamber, and facilities under K-Band, such as Agilent PNA, Agilent PSA, VSG, VSA, Power Amplifier, Real-time Oscilloscope, Logic Analyzer, Probe Station, Wire Bonder, TDR, and AWG.

Spherical Near-Field Antenna Measurement Anechoic Chamber

Features:

- Overhead swing-arm design for the probe theta motion, and an azimuth stage for the phi motion
- Full 360° scanning in phi, up to 330° or greater coverage in Theta scanning
- Low reflectivity AUT support column allows 'table top' mounting of wireless handsets with/without Phantom, terminals and laptops
- 430MHz -18GHz frequency coverage
- Wideband dual-pol probe, electronically switched during scanning
- Dielectric probe support arm is fabricated to reduce scattering and shadowing effects
- 3D Far-field and Spherical Near-field Scanning / Pattern Measurements
- Capability for Far-field, Holographic and Near-field Polarization Patterns and Power Patterns are featured
- Allowing measurement of maximal AUT size of greater than 90 cm in diameter @ 1GHz and above with Near-field scanning
- CTIA CATL certified/complied solution for mobile station active OTA TRP and TIS performance testing

Far-Field Antenna Measurement Anechoic Chamber

Features:

- Great-circle scan roll-over-azimuth positioner for DUT loading
- Full 360° scanning coverage in Phi and Theta axes
- Dielectric made roll stage and mast features DUT fixtures for wireless handsets with/without Phantom, terminal and laptop measurements
- 3D Far-field Pattern Measurement Capability for Polarization Patterns (CP/LP) and Power Patterns are featured



- Quiet Zone Size for DUT Testing Volume per Far-field Testing Criterion: > 60cm @ 1GHz
- Versatile cost-effective 3D add-on packages for existing NSI-800F-10 2D system

Planar/Cylindrical Near-Field Antenna Measurement Anechoic Chamber

Features:

- Record amplitude and phase over a surface in the radiating near field ($3\sim 5\lambda$)
- Process with a near-field to far-field transformation algorithm to produce full 3-D far field data.
- Measure all significant energy from the AUT
- Measure down at least -30 dB from NF peak
- Measure down beyond -50 dB to minimize truncation
- Can use NSI truncation evaluation in Processing Near-field and Display
- Sampling interval typically less than $\lambda/2$
- Wider sample spacing possible with higher gain antennas if far out sidelobes are low and measurement not required
- Good results have been achieved using 1λ , 2λ , 3λ spacing
- Two polarization measurements are required when:
 - Cross-pol results are desired
 - Accurate principal pol results are required in intercardinal planes
 - Measuring a CP antenna with linear probe

Name	Company	Model	Main Spec.	Location
Real-time Oscilloscope	Agilent	54855A	6GHz BW	RB202
PNA	Agilent	E8363B	10MHz-40GHz	RB202
PNA-X	Agilent	N5242A	10MHz-26.5GHz	RB202
PNA-L	Agilent	N5230A	10MHz-20GHz	RB202
Digital Phosphor Oscilloscopes (DPO)	Techtronic	DPO70804	8GHz BW, 25GS/s	RB202
PSA	Agilent	E4446A	3Hz-44GHz	RB202
PSA	Agilent	E4445A	3Hz-13.2GHz	RB202
Digital Serial Analyzer	Techtronic	DSA8200	7ps TDR (50GHz)	RB202

SOFTWARE

Electromagnetic simulation software packages	
SOFTWARE	COMPANY
CST Microwave Studio	CST
HFSS	AnSoft
Designer	AnSoft
IE3D	Zeland
XFDTD	REMCOM
FIDELITY	Zeland
FLUX2D/FLUX3D	CEDRAT
Ray tracing programs for field coverage simulation programs for indoor, urban, terrestrial environments	NTUST
Microwave Office	AWR
MagNet	Infolytica.
Simulation software packages for analyzing circuit properties on PCB's	
SOFTWARE	COMPANY
ADS	Agilent
PCBMod	EMIntegrity
Spicelink	VertMarkets, Inc.
SPEED2000	Sigrity, Inc.