

## **Electronic System Integration for RF Applications**



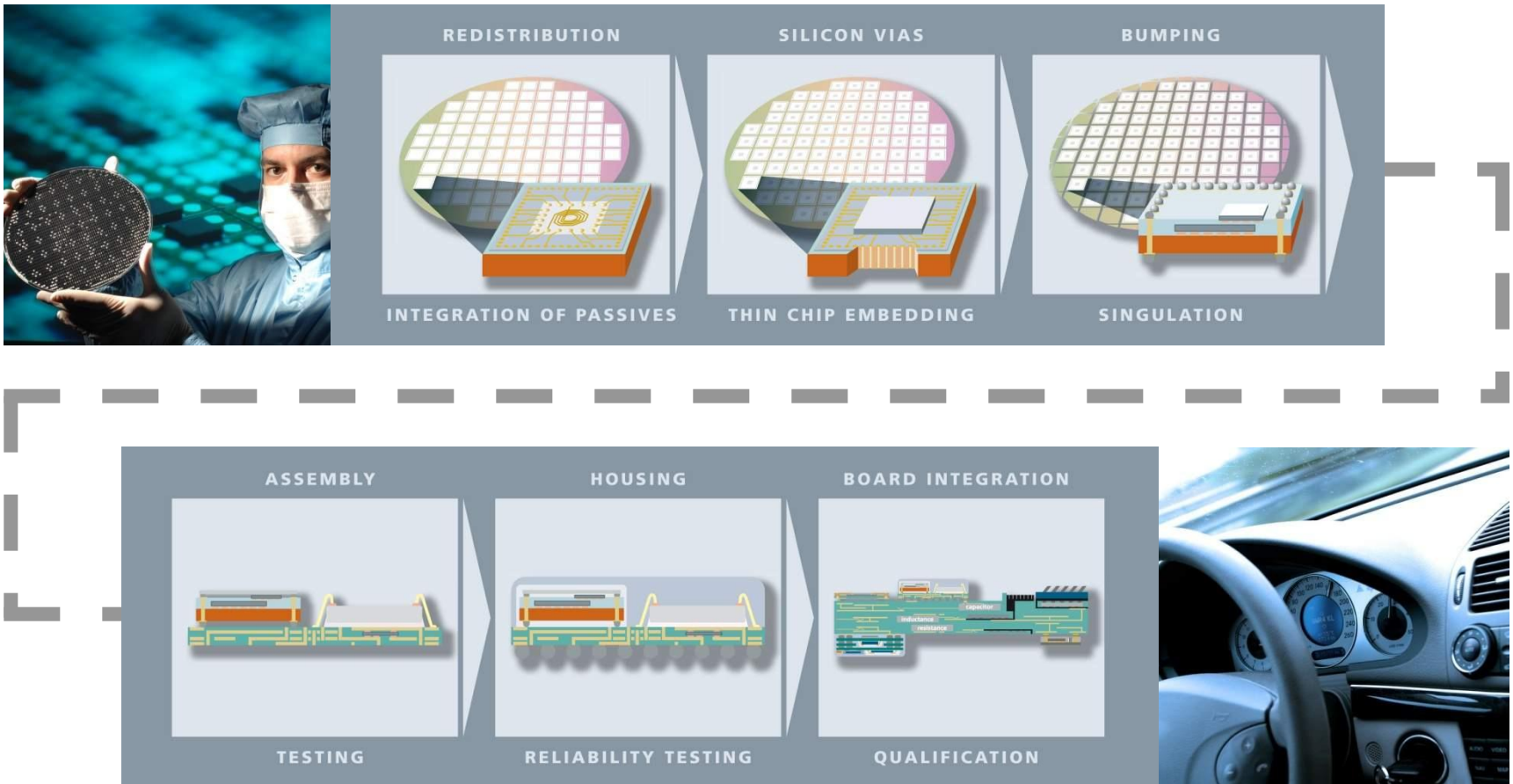


## Project Details

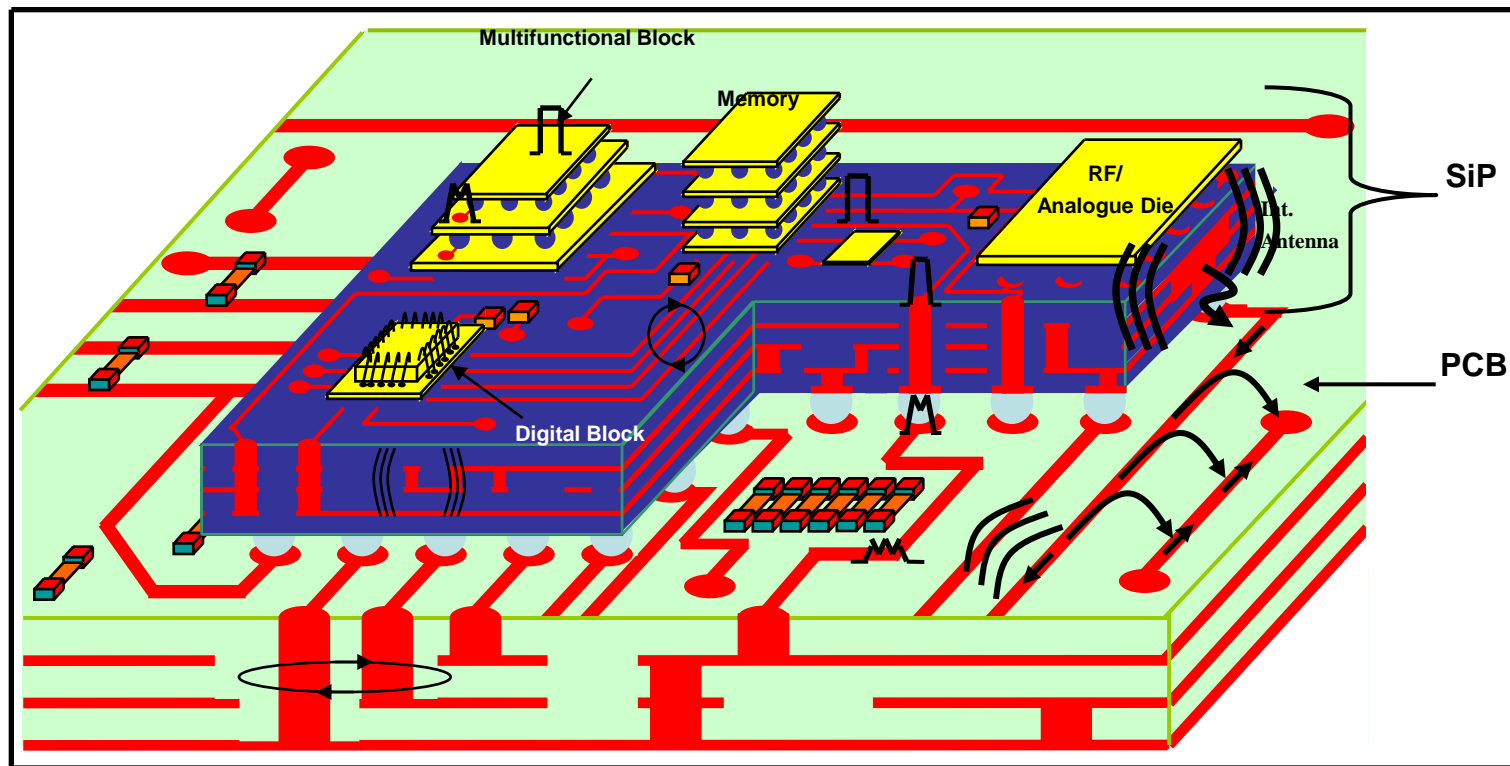
Project coordinator	Dr. Ivan Ndip
Other applicants	
Sector	Electronic System Integration for RF/High-Speed Applications
Call of Interest	<input type="checkbox"/> CORNET <input type="checkbox"/> EraSME
Proposal summary:	Provide expertise in electrical design, technological realization for RF applications; e.g. Wireless Sensor Nodes, RFID Applications, integrated Antennas
Advantages for SMEs, trade or industry:	Access to design experience, field simulation based case studies and optimization, vast measuring and characterization facilities, esp. for RF characteristics and antennas
Profile of partners sought:	



## Bringing Microelectronics into Application



## EMC/EMR Problems in Electronic Packaging and System Integration



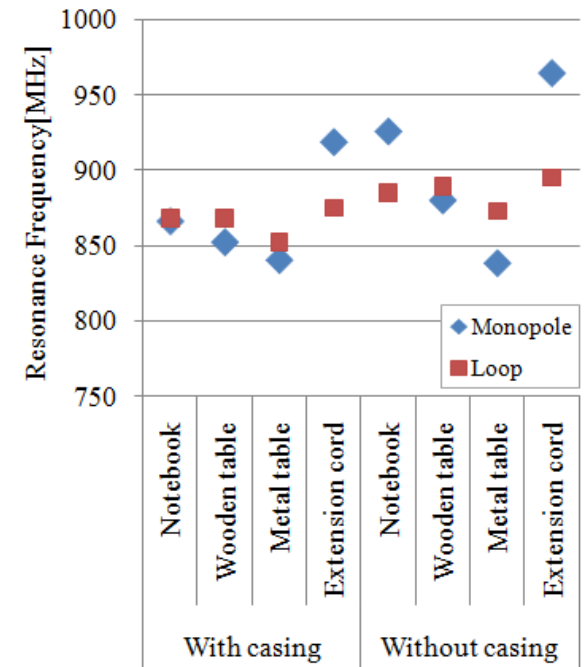
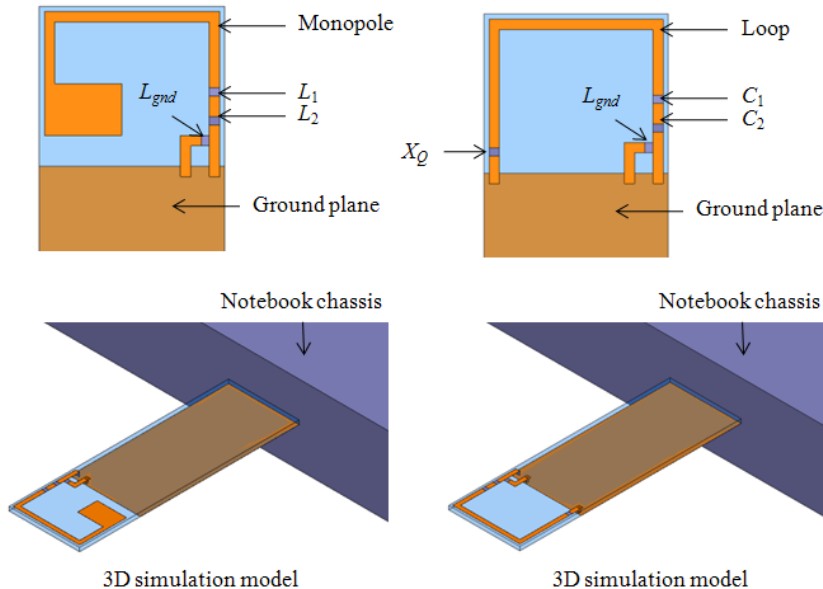
Schematic view of SiP Module on PCB

## R&D Focus

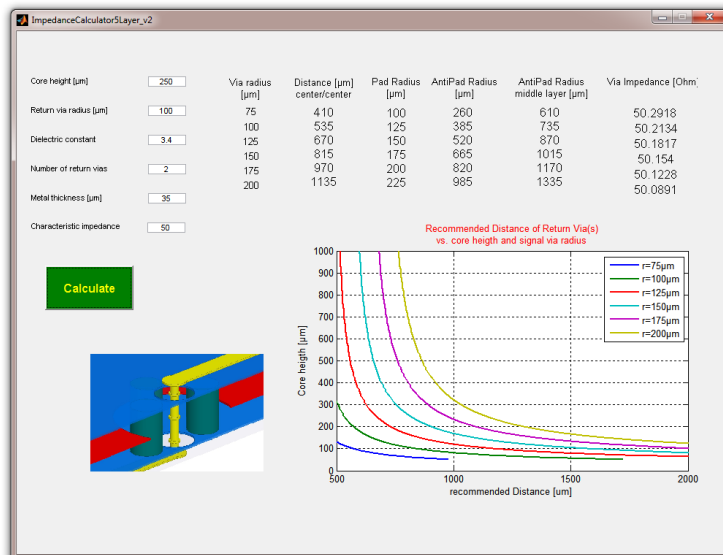
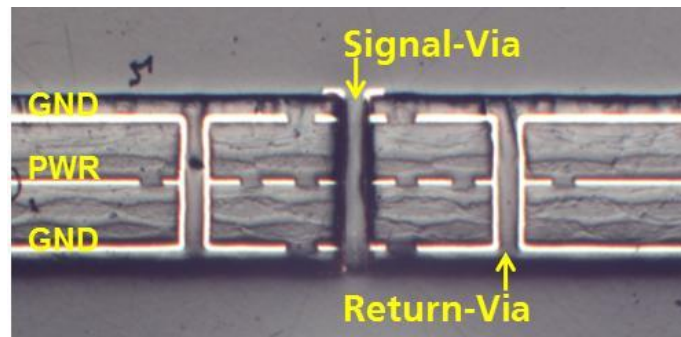
- **Electromagnetic Simulation, Measurement and Analysis for Signal/Power Integrity and EMC**
- **Antenna Modeling, Design & Integration for;**
  - **RFID, Lower Microwave and Millimeter-wave Applications**
- **Electrical Characterization of Dielectric Materials in Dependency of Temperature and Frequency**
- **Application of Results for Development of Graphical User Interfaces (GUI) for Fast Analysis of Electronic Packaging Structures**
- **Development of Prototypes**

# Integrated Antenna Design

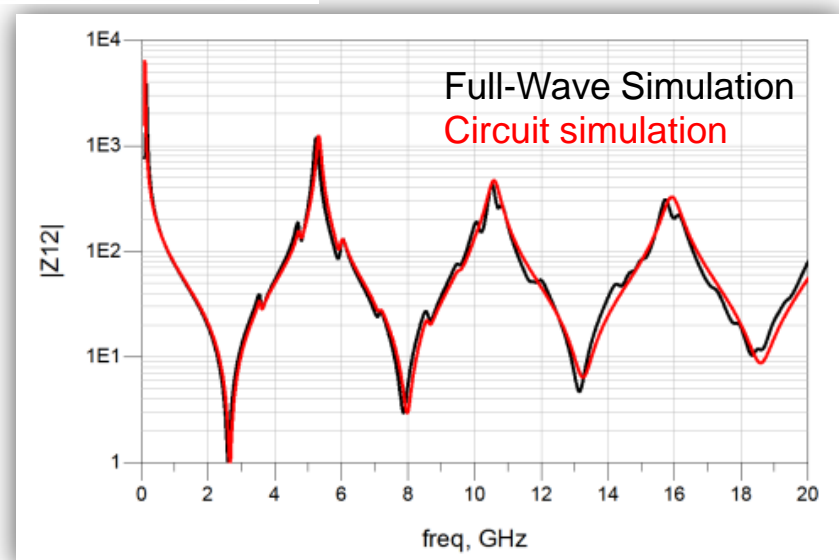
- Evaluation of integrated antennas for USB key



## Example: Optimization of Layer Stack-up and GUI Development for Efficient Analysis



GUI for via design in multilayer stack-up



Circuit simulation with via model

## TOOLS (SELECTED)

### ■ Electromagnetic Field Simulation Software

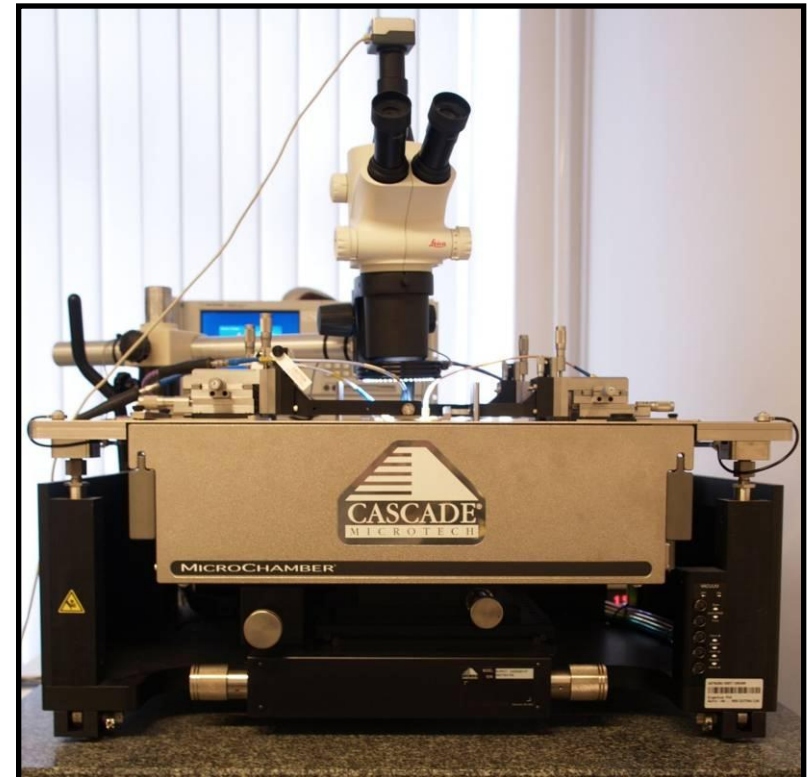
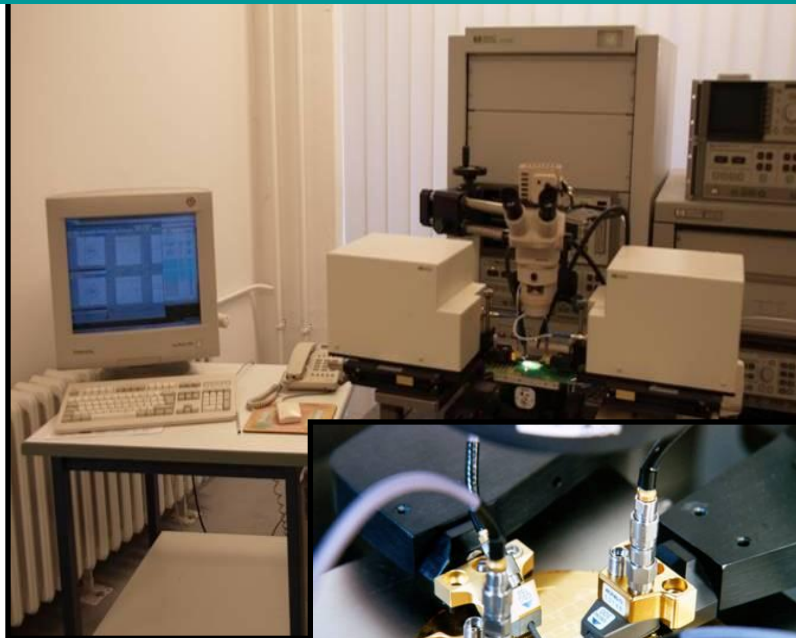
- HFSS (3D Full-wave)
- Microwave Studio (3D Full-wave)
- Q3D Extractor (3D Quasi-static)
- Fast Henry (3D Quasi-static)
- Maxwell (2D and 3D Static)
- Momentum (2.5D Quasi-static)

### ■ Circuit Simulation and Layout Software

- SPICE (incl. derivatives)
- Advanced Design System (ADS)
- Ansoft Designer
- *Cadence (Orcad, Allegro)*
- *SPECCTRA, Eagle, CAM350*

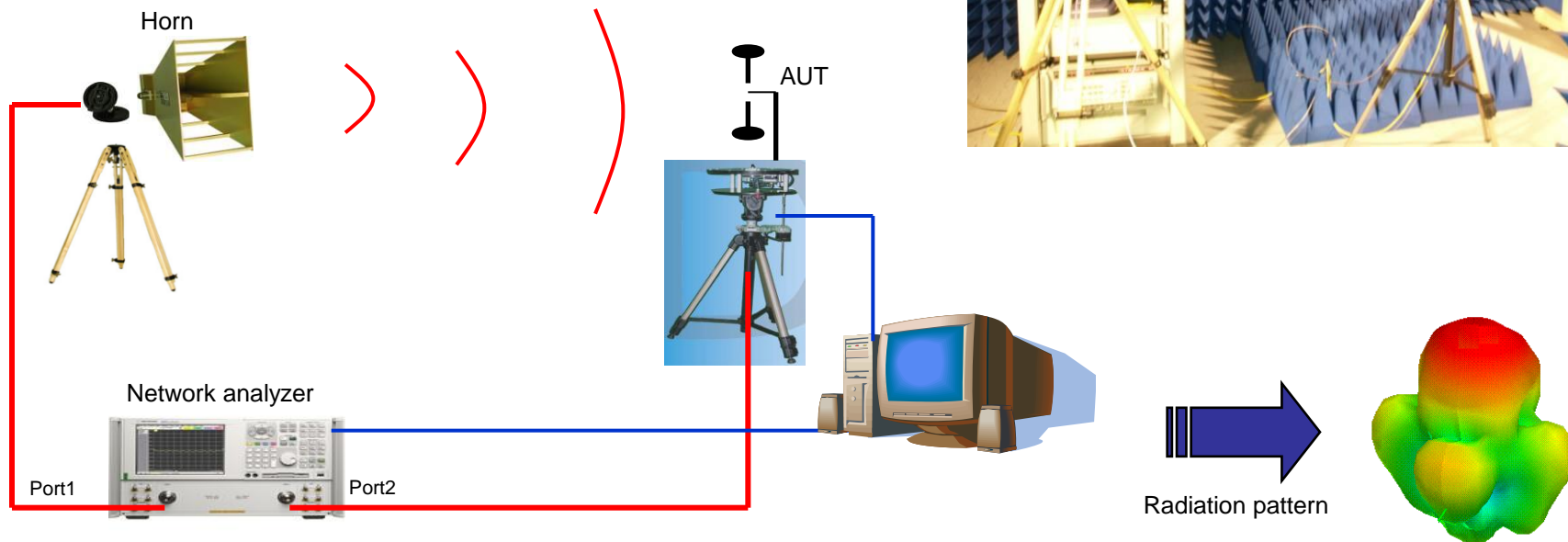
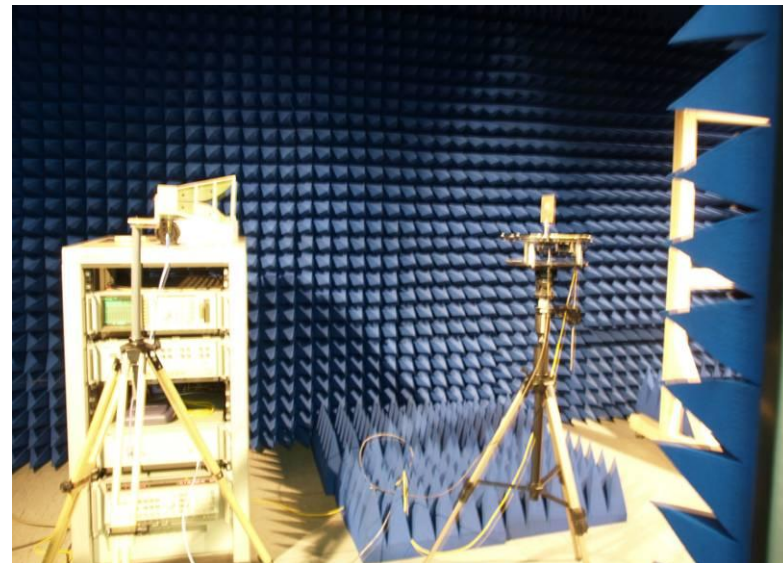
## MEASUREMENT EQUIPMENT - 1/2

- ❖ Agilent 8510C – 2-port VNA (45 MHz – 110 GHz)
- ❖ Agilent E8364A – 4-port VNA (45MHz – 50 GHz)
- ❖ Agilent 4294A Impedance Analyzer
- ❖ Agilent E5270A Precision DC Parameter Analyzer



## MEASUREMENT EQUIPMENT - 2/2

- ❖ EMC Chamber with Ferrite and Foam Absorbers
- ❖ DAMs 7000 Antenna Measurement System
- ❖ Calibrated Horn Antennas (up to 40 GHz)
- ❖ VNA 8510B and R&S Spectrum Analyzer



## CONTACT

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