KEYSIGHT

From Lab to Fab:
Boost IC Design with Digital Twin and EDA

Today's Presenters

Casey Latham
University Program Manager
Keysight EDA

Amit Varde
Director of Strategy & Solutions
Keysight EDA

Sherry Lyu
Device Modeling Specialist
Keysight EDA

Eva Ribes-Vilanova
Product Manager
Keysight EDA

Noah Schmitz
Director of University
Development, Americas

KEYSIGHT

Agenda

- **Introduction to Keysight EDA**
- **EDA Portfolio**
- **Going through the design phase**
  - **Data and IP Management**
  - **Device Modeling**
  - **Circuit, Module, PCB Design**
  - **System**
- **Supporting Universities**
- **Conclusion**

A Brief History of Keysight

**1939–1998:
Hewlett-Packard
years**

A company founded on electronic measurement innovation

**1999–2013:
Agilent Technologies
years**

Spun off from HP, Agilent became the World's Premier Measurement Company

In September 2013, it announced the spinoff of its electronic measurement business

**2014+:
Keysight years**

On November 1, Keysight became an independent company focused on the electronic measurement industry
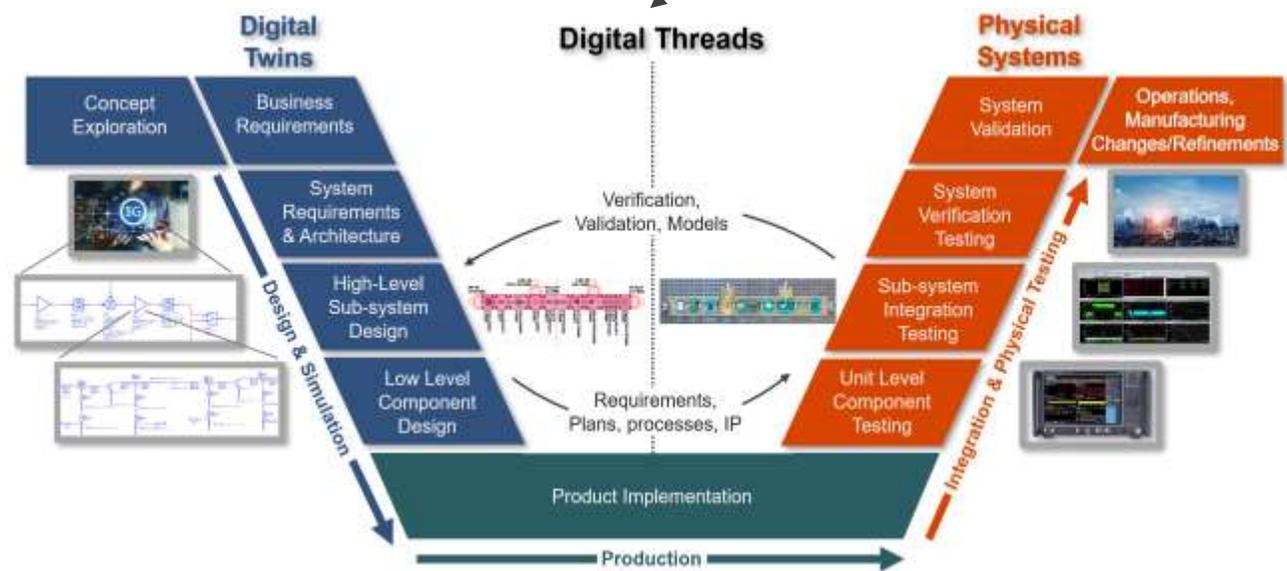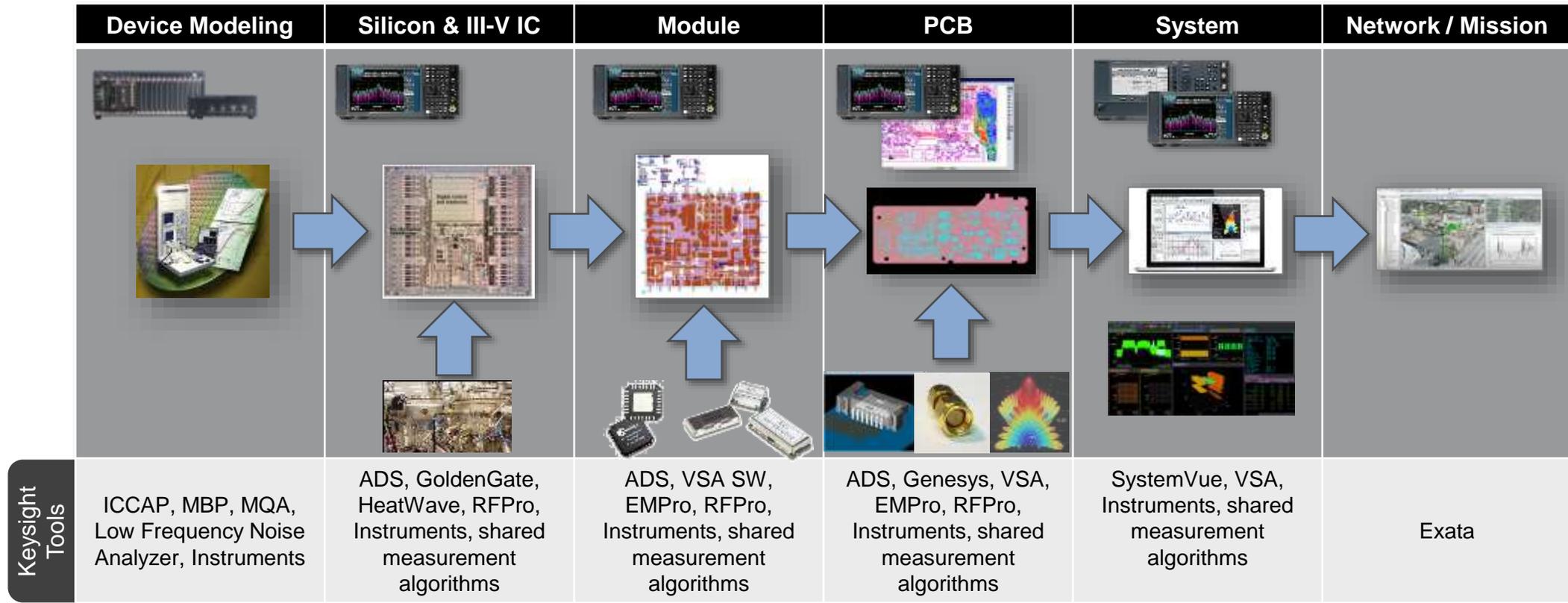
Speeding up the Lab-to-Fab Transition

"It's all about information turns. The faster you can learn, the faster you can get to the next node. It's whoever gets there first."

Dan Hutcheson
CEO, VLSI Research

An ecosystem of enablement, interoperability and modeling

Link and automate product development hierarchically and across design and test

Keysight EDA Tool Suite

| Device Modeling	Silicon & III-V IC	Module	PCB	System	Network / Mission
ICCAP, MBP, MQA, Low Frequency Noise Analyzer, Instruments	ADS, GoldenGate, HeatWave, RFPro, Instruments, shared measurement algorithms	ADS, VSA SW, EMPro, RFPro, Instruments, shared measurement algorithms	ADS, Genesys, VSA, EMPro, RFPro, Instruments, shared measurement algorithms	SystemVue, VSA, Instruments, shared measurement algorithms	Exata

(Keysight Tools)

Keysight/Cliosoft Design Data (SOS) and IP Management (HUB)

Keysight EDA – Key Solutions

Covering All Parts of the Design Cycle
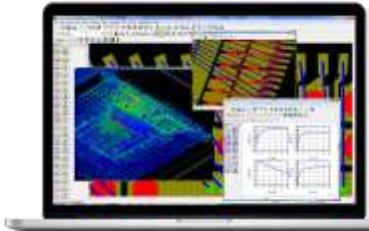
PathWave Advanced Design System (ADS)

- Design platform focused on RF/microwave, signal integrity, power integrity
- Circuit simulation – schematic to layout
- Design and simulate at component/IC level up package, laminate, or PCB level
- Design and simulation multi-technology circuits
- Simulators: Harmonic Balance, Transient, Circuit Envelope, Linear, Electro-Thermal/EM co-simulation
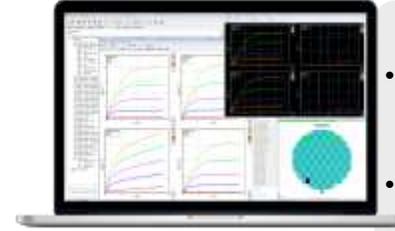
PathWave Device Modeling (IC-CAP)

- User-programmable industry standard software for DC, analog, and RF semiconductor device characterization and modeling
- Optimization, tuning, and links to most commercial circuit simulators
- Open modeling platform integrates with Python\PEL environment, suitable for new model development
- Integrated ANN toolkit for model generation
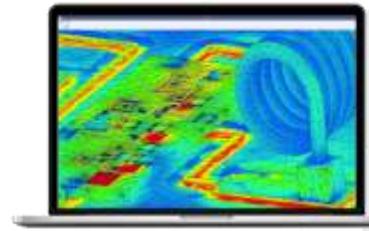
PathWave RFPro

- Runs inside of ADS and other EDA simulators
- Brings 3D EM simulation to circuit designers
- Run circuit/EM co-simulation without needing to remove active components
- Solvers: Momentum (planar 3D), FEM (full 3D)

PathWave Model Builder (MBP)

- High-volume and flexible model generation
- Integrates SPICE simulation, model parameter extraction, and model library generation
- Widely used for baseband industry standard models
- Supports compact, macro (subcircuit), and Verilog-A models

Other EDA Tools

RF and Microwave
- EMPro – full 3D EM engine for any geometry/architecture
- GoldenGate – Bring ADS simulators to RFIC flows
- HeatWave/ElectroThermal – Perform IC electro-thermal analysis, integrates with ADS
- Genesys – RF board circuit synthesis

System Level Design
- SystemVue – system-level design

Device Modeling
- Model QA – Easily validate SPICE models
- WaferPro Express – On-wafer measurement and programming test suite
- A-LFNA – Hardware for on-wafer measurement and analysis of low-frequency noise

Data Management
- Design Data Management (SOS)
- IP Management (HUB)

High-Speed Digital
- SIPro – Brings signal integrity design to ADS
- PIPro – Brings power integrity design for DC power distribution network to ADS
- Memory Designer – Design DDR4, DDR5 memory modules inside of ADS

Power Electronics
- PEPro – Design and analyze power electronics high-speed switched mode power supplies