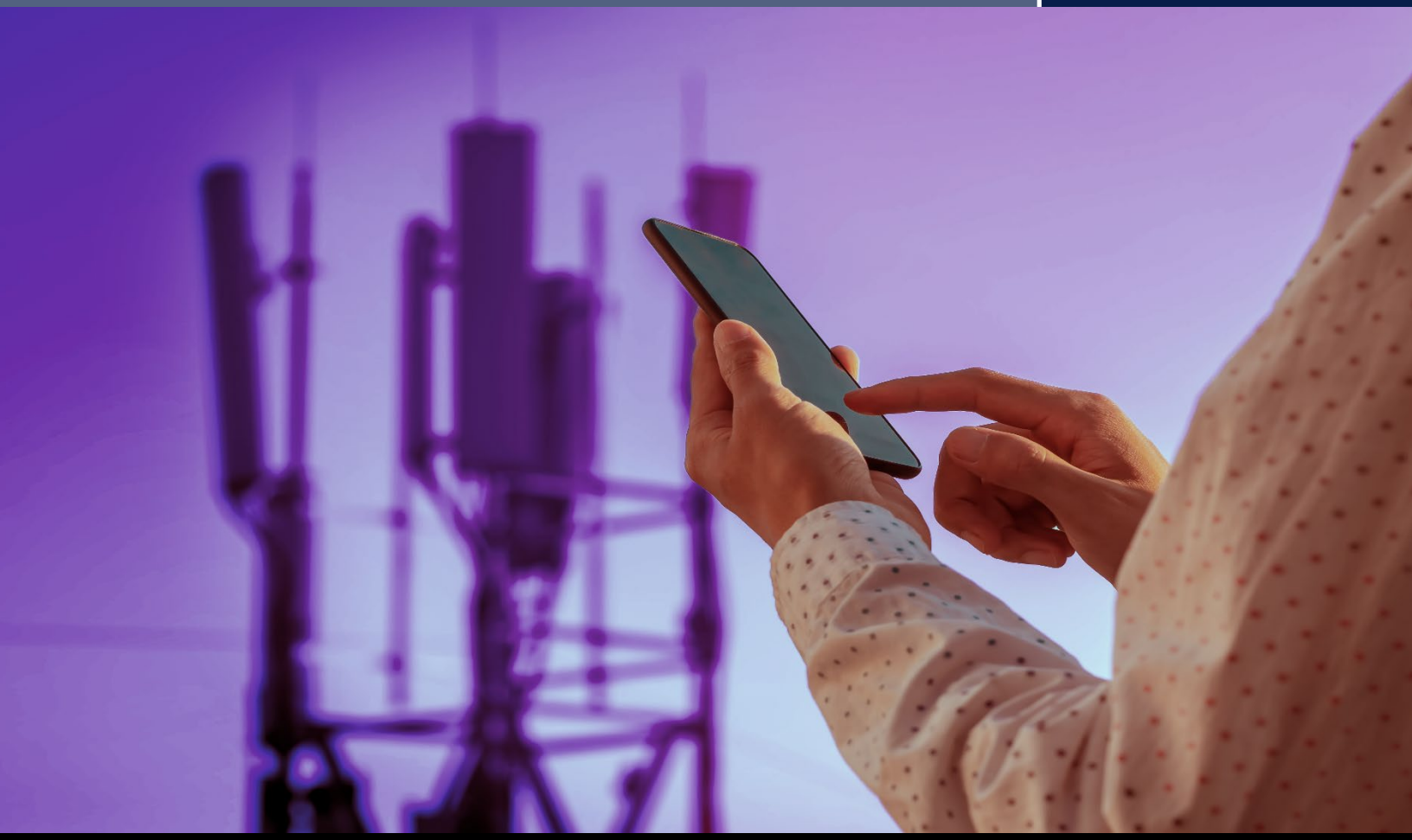
CASE STUDY



WIN Semiconductors Connects GaN MMIC Design and Verification in a Unified Workflow

Semiconductor | RF and Microwave Design

KEYSIGHT

Based on press release June 30, 2026

Keysight and WIN Semiconductors Collaborate to Cut Design Risk for High Frequency RF Components

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Company

WIN Semiconductors, provider of the NP 120P GaN PDK

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Solutions

Keysight ADS and RF Circuit Simulation Professional

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Challenge

Verify MMIC designs before foundry submission

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Results

Streamlined design flow and first-pass tapeout confidence

WIN Semiconductors and Keysight created a joint gallium nitride (GaN) monolithic microwave integrated circuit (MMIC) workflow linking on-chip simulation, 3D layout verification, and off-chip evaluation-board design.

WIN's NP 120P GaN Process Design Kit (PDK) works with Keysight Advanced Design System (ADS) and RF Circuit Simulation Professional to automate simulation, optimization, and verification before foundry submission.

> "We are delighted to collaborate with Keysight to deliver a customized LVS solution within the WIN ADS PDK. By combining Keysight's ADS expertise with WIN's robust PDK and advanced process technology, we provided a comprehensive verification solution that streamlined the customer's design flow and accelerated the time-to-market for advanced RF products with greater confidence and reliability."

Richard Kuo

Director of Design Service, WIN Semiconductors

The Challenge

GaN MMIC design houses serve applications such as 5G base stations, Wi-Fi access points, satellite payloads, and defense radar systems. Before fabrication, engineers must complete the simulation, optimization, and verification steps needed to sign off a design.

A missed analysis can carry a high cost. A failed tapeout can mean weeks lost to another foundry respin. Design teams therefore need to verify the chip thoroughly before submission while keeping chip-level and evaluation-board design aligned.

That alignment matters after tapeout, too. MMIC customers will not commit to purchase until they can measure performance on a physical evaluation board containing the MMIC, packaging, PCB, and test connectors. WIN needed a workflow that brought those on-chip and off-chip elements together and helped designers prove full-system performance before fabrication.

The Solution

WIN's NP 120P GaN Process Design Kit gives MMIC designers process models and layout rules. Integrated with Keysight Advanced Design System (ADS) and RF Circuit Simulation Professional, those models create a single workflow from chip design through evaluation-board design.

The workflow connects on-chip multidomain simulation, 3D layout with verification, and off-chip evaluation-board design. It automates the simulation, optimization, and verification steps required for design signoff, helping ensure engineers do not skip an analysis before foundry submission.

Engineers can design and optimize the MMIC, packaging, PCB, and test connectors together. This approach lets teams evaluate performance against specifications before fabrication and then verify performance with test equipment.

WIN and Keysight also delivered a customized layout-versus-schematic (LVS) solution within the WIN ADS PDK. The verification flow combines Keysight's ADS expertise with WIN's PDK and process technology for advanced RF products.



Figure 1. Keysight Advanced Design System (ADS) design and simulation environment

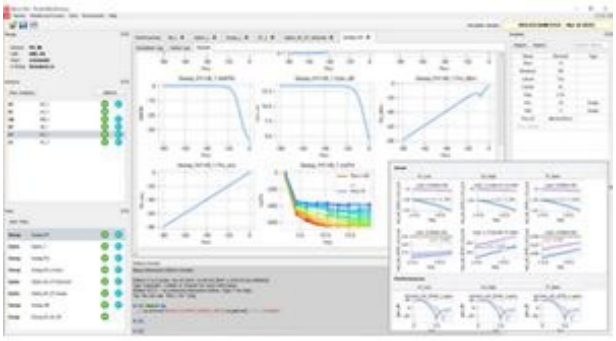


Figure 2. RF Circuit Simulation Professional workflow-based simulation and optimization interface

Results

The joint workflow gives GaN MMIC design houses a single path from chip design through evaluation board. By bringing simulation, optimization, layout verification, and board design together, it reduces the chance that a required analysis is missed before tapeout.

The approach also lets design teams address on-chip and off-chip components together and prove full-system performance before fabrication. That evidence can give MMIC customers greater confidence when they decide whether to commit to purchase.

Nilesh Kamdar, general manager, EDA, Design Engineering Software, Keysight, said: “WIN's complete PDK, combined with Keysight's simulation and verification tools, gives designers a single path from chip design through evaluation board. Design houses can now prove full system performance before fabrication, giving their customers the confidence to commit.”

Conclusion

WIN Semiconductors and Keysight connected the NP 120P GaN PDK with ADS and RF Circuit Simulation Professional to create an integrated MMIC design and verification workflow. The environment spans on-chip simulation, 3D layout verification, and off-chip evaluation-board design.

By bringing these activities together before fabrication, design houses can reduce tapeout risk, prove system performance earlier, and give customers the verification they need to make purchase decisions. The workflow supports developers of GaN MMICs for 5G, Wi-Fi, satellite, and defense radar applications.

Related Information

- Keysight Advanced Design System (ADS)
- Keysight RF Circuit Simulation Professional
- WIN Semiconductors company profile
- Keysight and WIN Semiconductors Collaborate to Cut Design Risk for High Frequency RF Components, June 30, 2026 press release

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