

Dedicated for RF/Microwave Circuit Design

# RFPPro Electromagnetic (EM) Simulation Environment

Performing EM analysis is as easy as Circuit simulation

RFPPro, the industry's first EM environment dedicated for RF and Microwave circuit design, is seamlessly integrated with Keysight Pathwave Advanced Design System (ADS) and Cadence Virtuoso. RFPPro makes performing EM analysis as easy as running circuit simulations, dramatically simplifying EM-circuit co-simulation of RFIC, MMIC and RF module designs for 5G, IoT and defense-aerospace applications.

*"The vision for RFPPro began in 2015. Circuit designers want to simply simulate any portion of their design with an EM tool and get the correct answers without having to "cookie cut" the layout and worry about wrongly setting up EM ports and ground references.*

*They want to have full confidence that the EM analysis was done correctly and immediately use the results in EM-circuit co-simulation to perfect their designs or to understand the impact of laminate layer misalignment, fabrication over-sizing or under-sizing.*

*They hate spending hours, days or even weeks of manual work removing active components or surface mount parts from the design just to perform the EM simulation and then re-attaching them all back for EM-circuit co-simulation. "*



Joe Civallo  
ADS Product Manager

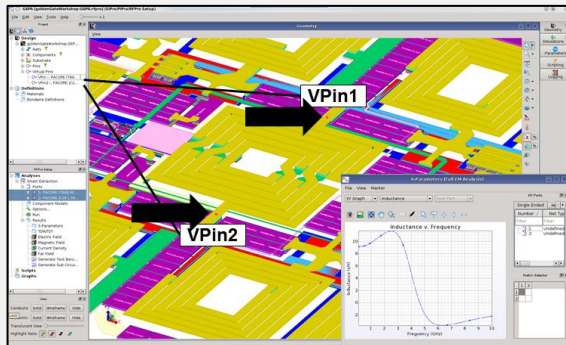
## “Imagine if I could just ‘EM’ any portion of my RF layout in situ”



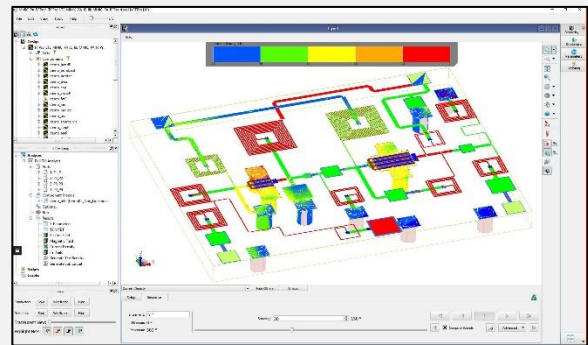
Matt Ozalas  
RF Module and RFIC designer  
Keysight Technologies

*“With increasing frequency, data rates and product miniaturization, RF circuit simulation alone is no longer adequate for the design of RF modules, RFIC and MMIC due to inevitable electromagnetic interactions. EM simulators are traditionally disconnected from RF circuit simulators, presenting design and optimization challenges at every iterative design step, which slows innovation and product introductions,”*

*“Imagine if I could just ‘EM’ any portion of my RF layout in situ without worrying about how to set up the analysis correctly and spontaneously use the EM results in my circuit design workflow; then I can account for or exploit the EM-circuit interactions to quickly explore innovative design options that would be very tedious to do before”.*



RFPPro performs EM analysis of RF layout in situ without cookie cutting



Predictive EM expert settings makes EM-circuit co-simulation of this MMIC as easy as circuit simulation

## RFPPro in Pathwave Advanced Design System (ADS) and Cadence Virtuoso

RFPPro is integrated in Pathwave ADS and Cadence Virtuoso. It offers predictive expert presets for correct EM analysis of user-identified physical circuit layout structures and automatic EM-circuit co-simulation partitioning for effortless integration of EM results into circuit design for interactive tuning and optimization. It makes significant progress on our vision to enable EM-circuit designs that can be parameterized, swept, tuned and optimized as easily as in circuit simulation. This means:

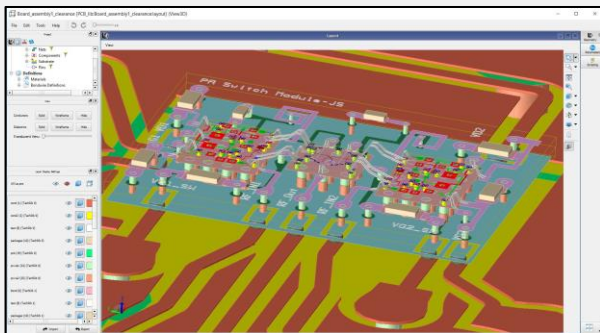
- Saving 2 hours to 2 weeks per simulation versus using external EM simulators
- Instant correct setup of EM-circuit co-simulation without layout modifications
- Automatic assignment of EM ports and materials
- No waiting for someone else to setup and run batched external EM analysis

## RFPro Upgrades

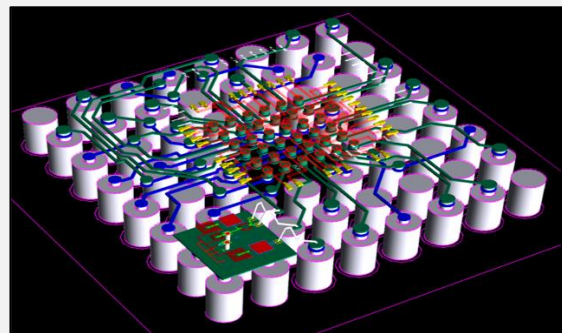
Increasingly powerful EM innovations with solver, meshing, visualization and predictive analysis settings are under active development to be included with each subsequent release of Keysight's Advanced Design System. RFPro is offered in the following ADS bundles and element. Early RFPro customers enjoy free upgrades even as prices increase with the addition of new powerful capabilities in subsequent ADS releases.

Model Number	Description
W2243BP/BT	ADS Core, Layout, Advanced Layout, RFPro UI, Momentum, FEM Bundle
W2206BP/BT	ADS Core, Layout, Advanced Layout, Harmonic Balance, RFPro UI, Momentum, FEM Bundle
W2209BP/BT	ADS Core, Ckt Sim, Layout, Adv Lay, RFPro UI, Momentum, FEM, Ptolemy, Vlg-A, Mature Wless Lib Bundle
W2215BP/BT	ADS/EMPro Core, Harmonic Balance, Layout, Advanced Layout, RFPro UI, Momentum, FEM Bundle
W2340EP/ET	RFPro UI, Momentum, FEM Element

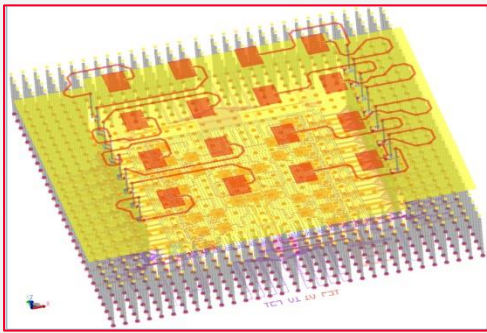
Additional product information is available at [www.keysight.com/find/eesof-RFPro](http://www.keysight.com/find/eesof-RFPro)



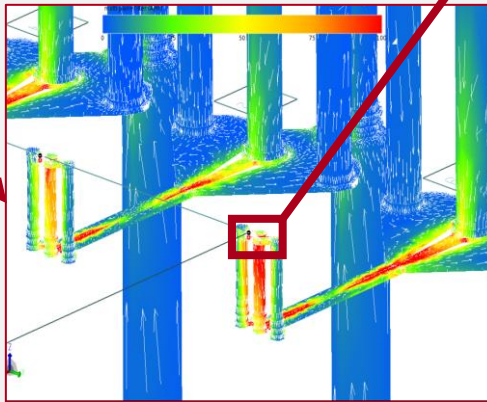
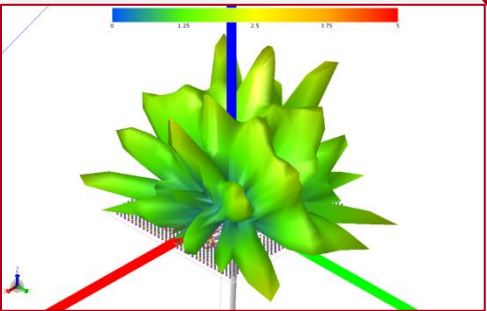
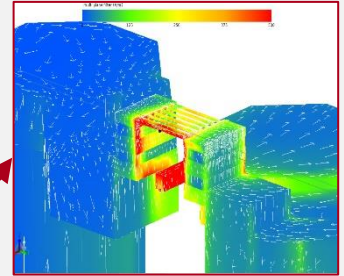
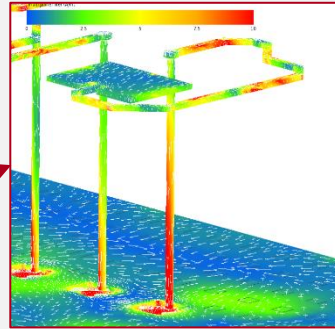
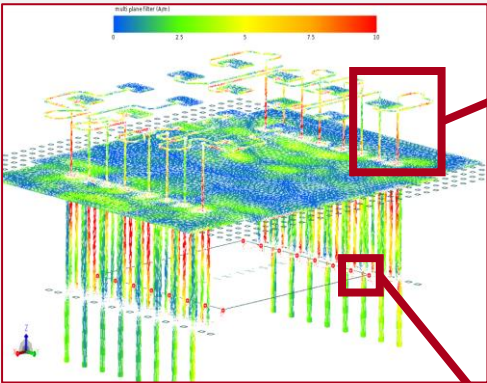
RF Module power amplifier (PA) assembly, 3D visualization and simulation in RFPro



Assemble Fan Out Wafer Level Packaging (FOWLP) in ADS and auto-extract nets and components with RFPro for EM simulation



Assembly in ADS and simulation with RFPPro of single chip 60GHz WiGig beam forming IC integrated with 1 balun and 30 rat race couplers below for signal splitting to feed 4x4 antenna array above using wafer level packaging



Current density at 60GHz for 16 IC-Package-Antenna transitions simulated with Finite Element Solver in RFPPro and resultant far field antenna radiation

Learn more at: [www.keysight.com](http://www.keysight.com)

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)



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