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Is your PCB design tool up to speed? A comparison

Do you have everything you need to succeed in designing next-generation electronic products and systems?

Siemens Digital Industries Software

Bringing feature-rich products to market faster requires seamless integration

What characteristics do successful PCB Designers share?

- Integration of electronics with mechanical cross-product development
- Efficient design processes, data compatibilities and limited need for manual intervention
- Little dependence on physical prototyping

Design creation: comparison

	PADS Professional	Altium Designer	OrCAD
Schematic Design	★★	★★	★★
FPGA I/O Optimization	★★	N/A	★
Constraint Management	★★★	★	★

FPGA I/O Optimization
Competitor tools either have no solution for FPGA co-design or a 3rd party solution.

Constraint Management
PADS Professional has an integrated constraint management which can be accessed from either schematic or layout (enter once, propagated though the design). Competitor Constraint Management support is either based on antiquated dialog box rule entry, use a non-user friendly query language, or is supported via a 3rd party tool.

Complete solution for schematic design capture and reuse

Schematic design
- Access symbol database
- Rapidly create, connect & capture schematic
- Electrical & physical constraints integrated with layout
- Real-time concurrency with layout

Constraint manager
- Define, edit and cross-probe from design entry through PCB layout
- Use templates to apply complex rules to multiple nets
- Update from within the schematic or PCB layout editor
- Validate layout against design intent

FPGA-PCB co-design
- Bi-directional, rule-driven I/O assignment and data exchange
- Automated, fast FPGA symbol generation
- Use floor planner for FPGA I/O optimization and improved routing
- Simultaneously optimize connections between FPGAs

Simulation: comparison

	PADS Professional	Altium Designer	OrCAD
Electrical Rule Checks	★★★	★	★★
Signal Integrity Analysis	★★★	★	★★
Power Integrity Analysis	★★★	★★	★
Thermal Analysis	★★★		★
Analog Mixed-Signal	★★	★	★★★

- Electrical Rule Checks - PADS Professional is a powerful solution that can identify many SI, fabrication, and assembly issues. It is a scalable solution and supports customizable rules. Other tools lack in rule customization or utilize a 3rd party tool.
- Signal Integrity Analysis: PADS Professional has a full, scalable SI solution, powered by HyperLynx. Other tools have only basic pre-layout SI or use a 3rd party tool and are difficult to use.
- Power Integrity Analysis: PADS Professional provides an integrated PI solution powered by HyperLynx. Competitors rely on 3rd party options.
- Thermal Analysis: PADS Professional comes with basic thermal analysis, and an option to add CFD analysis. Competitors either have no option for thermal analysis. They rely on 3rd party options or require that you to migrate to an enterprise level product.
- Analog/mixed-Signal Analysis: PADS Professional is supported by System Vision and is included in PADS AMS.

PCB simulation solutions for high-performance designs

Using simulation throughout the design process is key to reduce dependencies on physical prototypes, to avoid detection of errors in later stages of the design, which increases time-to-market and cost, and to eliminating product failure.

Electrical DRC simulation executes automated and custom E-DRC checks

Signal Integrity analysis for PCB systems, including Fast-Eye diagram analysis, S-parameter simulation, and BER prediction allows for accurate modeling of trace impedance, coupling, and frequency-dependent losses

Power Integrity analysis identifies potential power integrity distribution issues and areas of excessive current density, PDN impedance validation range, and the effects of IC switching noise as is propagates throughout planes and vias

Thermal Analysis simulation analyzes major heat-transfer mechanisms and finds component and PCB hot spots to resolve issues early

Analog-mixed Signal analysis helps

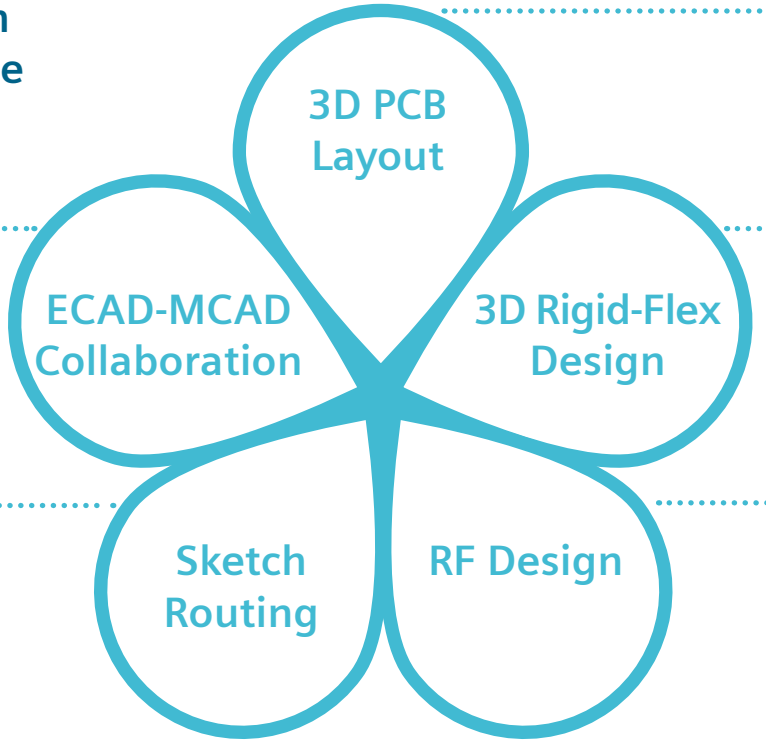
- design PCB to specification using standard time and frequency domain analysis
- examine performance sensitivities, analyze statistical behavior and manufacturability
- Test PCBs with a model of the end system using virtual prototypes

Layout: comparison

	PADS Professional	Altium Designer	OrCAD
3D Layout	★★★	★★★	★
Rigid-Flex	★★★	★★	★★
ECAD/MCAD Collaboration	★★★	★★	★★
Sketch Routing	★★★	★	
RF Design	★★★	★	★

- **3D layout:** PADS Professional uses a 3D kernel from a major MCAD vendor, and provides higher capacity. Competitors tools use open source solutions.
- **Rigid-flex:** PADS Professional utilizes the same technology as Xpedition. Competitors' tools has an inferior technology.
- **ECAD/MCAD:** PADS Professional and OrCAD utilize the industry standard IDX data format. PADS Professional also has enhanced integration with NX, and soon with SolidEdge. Altium does not support IDX standard, and integrates to SolidWorks and PTC Creo only.
- **Sketch Routing:** PADS Professional provides powerful Sketch Routing technology with layer changing and controlled via placement capabilities. Competitors either have inferior solutions or are no solution or inferior solutions.
- **RF Design:** PADS Professional has the same RF-centric technology as Xpedition. It works bi-directionally with Agilent ADS and NI AWR. Competitors either provide minimal functionality or have none.

Leverage industry-leading technology to create complex designs with effectiveness and confidence



Place true 3D component models in 3D layout and save time by placing component groups and reuse blocks. Optimize connections, define route patch, and sketch paths to drive critical routing.

Define PCB envelope in MCAD, place physical interface components and use bi-directional collaboration placement with ECAD to completion. Validate design integrity while making sure ECAD & MCAD are constantly synchronized.

Place & Route flex structures and achieve first-pass success using the flex-aware 2D/3D design environment. Screen full board with flex-specific rule checks and validate designs in a photorealistic 3D to minimize iterations.

Use defined sketch paths to control and design routing intent. Route individual. Hundreds, single-ended or differential pairs while traversing layers and selecting vias on-the-fly using packed or unpacked routing styles per design density.

Place RF elements for microstrip, stripline and multilayer RF design while utilizing specific routing and tuning capabilities for circuitry optimization. Use RF layout features for adding stitch vias and meanders and a dynamic link to software from Agilent or AWR for simulation.

Data management: comparison

	PADS Professional	Altium Designer	OrCAD
Component Creation and Library Management	★★★	★	★

PADS Professional is using a correct-by-construction methodology that helps insure parts are correct. It is based on modern wizard authoring tools, which makes PADS Professional user-friendly, and a central library promotes easy access and sharing by workgroups. Competitor tools either provide a decent library solution, with an inferior quality of the starter library, or it uses dated authoring tools.

Build and manage components and automate archive management

PADS Professional wins in every category!

	PADS Professional	Altium Designer	OrCAD
Technology	★★★	★	★
Support	★★★	★★	★★
Scalability	★★★	★	★★★

PADS Professional is the #1 self-contained, integrated PCB design flow for hardware engineers and small workgroups.

Design, validate, and manufacture complex PCBs with PADS Professional, the cutting-edge solution that delivers Xpedition® technology to engineering professionals who work outside a corporate CAD environment.

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