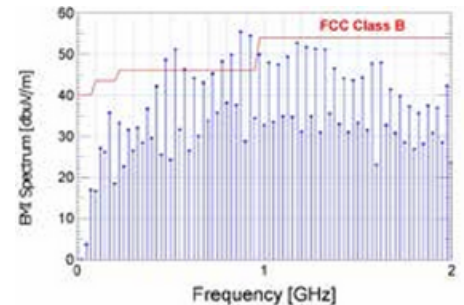# Signal Integrity

TAP INTO THE EXPERIENCE OF OUR SIGNAL INTEGRITY (SI) AND POWER INTEGRITY (PI) TEAMS — ensuring your high-speed project is properly modeled and constrained to achieve the maximum performance to cost ratio. The right tools, systems models, and interpretation of results and verification are all part of the rigorous process you can expect from us, ensuring your project is done right, the first time.

Your teams are facing unique challenges, and we understand — too many projects and too few engineering resources. And that's not all. Designing for your complex prototype or product requires deep technical knowledge as well as thoughtful consideration and planning. Bottom line, you need to meet your roadmap schedule, and with Fidus as an extension of your team, you will get there, and get it right the first time.

HOW WE HELP

Delivering solutions at the speed of your business.

After more than 20 years, 3,000 projects and 400 customers, we've learned how to transform your idea, vision or concept into the product you've imagined. That's because we know how to take complex problems, and design and deliver them against dynamic environments and tight deadlines.

Your project needs the right team and the right toolset with a rigorous process to deliver on your capability and capacity challenges. At Fidus, we become a seamless extension of your team, with a clear focus and commitment to getting your design or prototype to market faster.

Help up the performance of your product with our signal and power integrity teams. And they will dig in and advise you on optimum topologies for emerging memory technologies, interconnects within complex computing platforms (PCIe Gen 4), Interlaken systems (12.5Gbps links), FPGA transceivers (58G and 112G PAM4), and complex layer stacks using next generation laminates with buried capacitance to support the latest FPGA's and ASIC's.

That's not all! Our signal integrity design teams' skills are well complemented by our PCB layout, FPGA/DSP, hardware, embedded software, and mechanical design expertise.

Extend your team — you choose how we work together.

Design projects have many elements, all of which are in your control when you work with Fidus. Do you want to hand off the whole project or just find a few people to supplement your staff? Looking for project management to keep you informed and the project on track? Our breadth of expertise, creative team structures, and flexible payment options allow a customized service that works for you:

- **Turnkey design services:** Plan and execute with our team for an end-to-end development solution, or choose anything in between to suit your requirements.

- **Staffing services**: Utilize a design expert at your virtual or physical location, for the length of your project, or for a targeted engagement.

DESIGN EXPERTISE

• Fidus delivers SI, PI, and EMC analysis for on-chip IC design, package design, PCB-level, and system design

• Layer stack-up, hybrid technologies, via, and net topology design

• Capabilities and experience 32.75Gbps (NRZ) to 56 Gbps (PAM4)

• IBIS, IBIS-AMI model simulations, including Power Aware IBIS v5.0

• Pre-layout, during layout, and post-route, high-speed signal integrity analysis and simulation for verifying signal quality, reducing signal reflections, increasing timing margins, reducing crosstalk, enhancing power integrity through cost effective decoupling design, simultaneous switching noise (SSN) reduction and reducing conducted and radiated emissions

• Expertise in high-speed memory interfaces (DDR4 and DDR5)

• Shield designs for both compliance and sensitive signal preservation

TOOLS FOR HIGH-END DEVELOPMENT

Fidus maintains licenses for:
Agilent® ADS, ANSYS® HFSS™, Cadence® SIGRITY, Mentor Graphics® HyperLynx®, Cadence PSpice®, Synopsys® HSPICE®

RF laboratory equipment: Agilent® Network Analyzer, Agilent Vector RF/Signal Generator, Agilent PXA Signal Analyzer, Agilent Electronic Loads, Spectrum Analyzers, multi-channel oscilloscopes to 40 GS/S

EXAMPLES OF OUR WORK

Power integrity

• Design for meeting target impedance or noise level
• Optimize PCB stackup for power distribution
• Optimize number and location of decoupling capacitors
• SSO noise reduction

High-speed memory interfaces
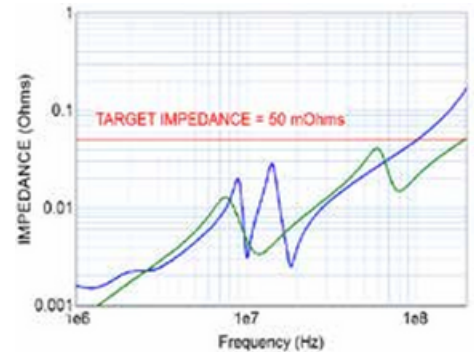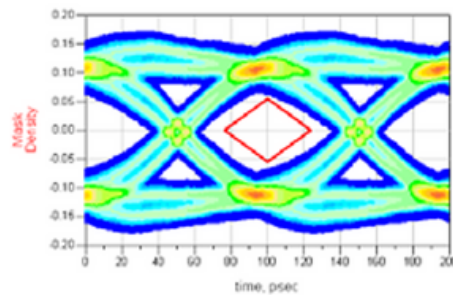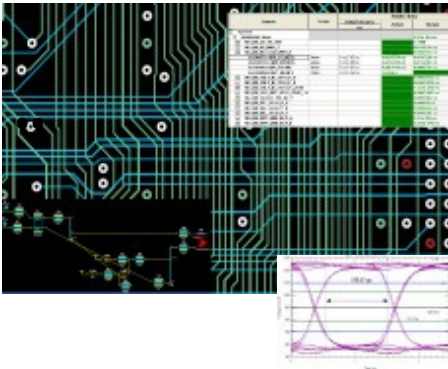
• DDR4, DDR5, GDDR6 memories and modules

• Cross talk reduction
•Topology templates and routing guidelines
• Pre- and post-route simulation
• Dynamic timing verification

SerDes design and optimization

• Experience with 56Gbps PAM4 designs
• Link budgets
• Interconnect optimization
• Pad compensation
• s-parameter and eye diagram simulation
• Pre-emphasis and equalization

System design

• Power, grounding, decoupling and filtering analysis
• 28Gbps SFP+ and QSFP+ Cable adapter modules
• High-speed backplanes
• Multi-gigabit serial links
• 3D heat sink and enclosure modeling for EMI

Fidus - Premier AMD Adaptive Computing Partner

AMD enables smarter, connected, and differentiated systems, integrating the highest levels of software-based intelligence with hardware optimization and any-to-any connectivity. By invitation, Fidus became the Inaugural Premier Design Services Partner for AMD Adaptive Computing (formerly Xilinx). As a Premier Design Partner, Fidus receives exclusive training, certification, and early access to tools, IP and new silicon. With ever-increasing requirements for designers to conduct thermal simulations, Fidus provides you with access to thermal simulation tools and the required resources to run your specific thermal simulations. Ease your cost and support burden and leverage the expertise, experience and tools from Fidus.

DESIGN SOLUTIONS WITH FIDUS

Need prototype and product design help?

We'll work with you to understand what you're looking for, and we'll dedicate the necessary resources to make sure it's a success the first time. Come to us with just an idea or specific challenges that are keeping you up at night, and we'll help you solve them.

Fueled by 20+ years' experience, our expertise, and creativity, along with our collaborative and process driven approach, turns complex challenges into well-designed solutions, and we keep customers like you coming back, again and again:

1. We are committed to "first time right".
2. Experience has taught us how to solve problems on any scale.
3. Faster time to market means faster time to benefit.
4. You choose how we work together.
5. Unique projects are our obsession.
6. We believe transparency builds trust.
7. Customer focus is our calling card.

20+
years experience
Collaborating with smart teams is what fuels us every day.

3,000+
successful projects
Your unique challenges are our obsession.

400+
customers
Extending your team with our expertise brings designs to market faster.

95%
retention
Customers love to work with us, again and again.

ABOUT FIDUS

Fidus Systems, founded in 2001, specializes in leading-edge electronic product development with offices in Ottawa and Waterloo, Ontario, and San Jose, California. Our hardware, software, FPGA, verification, wireless, mechanical and signal integrity teams work to innovate, design and deliver next-generation products for customers in emerging technology markets. Fueled by 20+ years' experience and creativity, along with our collaborative and process driven approach, we turn complex challenges into well-designed solutions. And with over 400 customers and 3000+ completed projects, we have the expertise to be a seamless extension of your team, providing a clear focus and commitment to getting designs and prototypes to market faster. Once you start working with us, you'll trust us like one of your own. Our hallmark is transparency. Our guiding principle is first time right.

fidus
innovate·design·deliver

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