Lauterbach Pushes Boundaries in Embedded System Design with AMD Adaptable MPSoCs

Lauterbach Debug and Trace Tools use AMD Zynq™ UltraScale+™ MPSoC

PARTNER

LAUTERBACH

INDUSTRY

Telecommunications, Industrial, Healthcare, Aviation

CHALLENGES

Lauterbach was looking for a high-performance, flexible, and low-energy solution that it could rely on for its debug and trace tools.

SOLUTION

AMD Zynq UltraScale+ MPSoCs deliver the extensive performance, flexibility, and efficiency required to address Lauterbach's next-generation TRACE32® debug and trace tools as well as multiple levels of security, increased safety, and advanced power management.

RESULTS

With the AMD Zynq UltraScale+ MPSoC, Lauterback was able to achieve all of its goals, including improving the flexibilty and performance of its trace and debug tools, improving power efficiency, and expanding product features.

AMD TECHNOLOGY AT A GLANCE

AMD Zynq™ UltraScale+™ MPSoC
AMD Kintex™ FPGAs

Founded in 1979, Lauterbach has established itself as a market leader in in-circuit emulators and debug tools. Today, with more than 40 years of experience, Lauterbach's easy-to-use TRACE32® debug and trace tools for microprocessors are widely used in many industries from renewable energy to smartphones to vehicles and many more. TRACE32® PowerDebug is a powerful, modular, flexible debug system that adapts and grows as customers move from project-to-project and chip-to-chip. TRACE32® PowerTrace extensions collect information while the system under examination is running normally, without interruption. It's used for timing analysis, to locate hard-to-find bugs that only occur at run-time, or to create code coverage reports for certification.

CHALLENGE

Lauterbach's customers have always expected high performance, functionality, and reliability from TRACE32® tools, as well as support for multicore debugging, all types of hypervisors, and operating systems.

In addition, flexible upgrades to new chips should be possible as well as the correlation of external signals with the program code to perform, for example, energy profiling.

Lauterbach had to consolidate all these requirements in its products at the chip- and software-level and was looking for a high-performance, flexible, and low-energy solution consisting of as few chips as possible to maximize reliability.

SOLUTION

After extensive evaluation, Lauterbach PowerDebug modules have been designed based on the AMD Zynq™ UltraScale+™ MPSoC. The device delivers unprecedented processing, I/O, and memory bandwidth in the form of an optimized mix of heterogeneous processing engines - Arm® Cortex®-A53 CPUs can be clocked at 1.3 GHz and Arm Cortex-R5F real-time CPUs at 533 MHz - embedded in a high-performance, on-chip interconnect with appropriate on-chip memory subsystems.

AMD Zynq UltraScale+ MPSoCs offer the extensive performance, flexibility, and efficiency required to address Lauterbach's next-generation TRACE32® debug and trace tools as well as multiple levels of security, increased safety, and advanced power management, which were also critical requirements for Lauterbach.

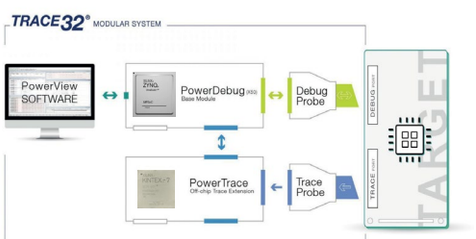

Figure 1: TRACE32 Modular System

"Our customers have 15-year-old debug tools, so there is a long maintenance time involved. These products are very durable and often operate in harsh environments," said Rolf Kühnis, strategic technical alliance manager at Lauterbach. "With AMD's flexible Zynq adaptive SoCs, we're able to easily upgrade these products in the field."

RESULT

With this solution consisting of a Zynq UltraScale+ MPSoC high-performance chip, which is supported by an AMD Kintex™ 7 FPGA for trace extensions, Lauterbach was able to achieve all design goals, including:

Providing maximum flexibility: The TRACE32® PowerDebug X50 base module, for example, can be configured to support any of the more than 15,000 devices from the more than 150 supported chip architectures by simply swapping the debug probe or adding a suitable license.

Extending the performance of its debug and trace tools: The powerful implementation in the PowerDebug module leads to very fast response times during debugging. Lauterbach shifts a lot of tasks to the Zynq UltraScale+ MPSoC close to the target. A pure software-based implementation in the PC would cause everything to slow down due to high latency times. The trace extensions achieve a trace bandwidth of 80 Gb/s, which is provided by the TRACE32® PowerTrace Serial 2.

Expanding the feature set: Lauterbach delivers unlimited multicore debugging, OS- and AUTOSAR-aware debugging, hypervisor-aware debugging, remote debugging, adding logic analyzer modules for recording chip data and hardware signals in real-time, and much more.

Power efficiency: The Lauterbach solution, based on AMD Zynq UltraScale+ MPSoC and its Advanced Dynamic Power Management Unit, helps keep power consumption low.

"AMD is a reliable partner that delivers flexible products at the right time, with the right price and package options," Kühnis said. "When our customers come up with new ways to do things and they need a solution fast, the flexibility offered through AMD helps us quickly serve those customers' needs."

WANT TO LEARN MORE?

About AMD Zynq UltraScale+ SoCs

About AMD Kintex FPGAs

About Lauterbach PowerDebug System

About Lauterbach

Lauterbach is a leading manufacturer of cutting-edge development tools for embedded systems with more than 40 years of experience. It serves customers all over the world, is partnering with all semiconductor manufacturers, and growing steadily. Lauterbach develops and produces highly proficient and specialized, easy-to-use development tools under the brand TRACE32®. Subsidiaries in the UK, Italy, France, Tunisia, US, Japan, and China and highly qualified sales as well as support engineers in many other countries make the full product range available worldwide. For more information, please visit www.lauterbach.com.

About AMD

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