



Enclustra Redefines RF Performance and Programmability in a Compact, Low-power Package

Enclustra's Andromeda XRU50 RFSoc module brings cutting-edge capabilities and unparalleled flexibility to emerging FPGA-based radiofrequency applications.

Highlights:

- The Andromeda XRU50 integrates AMD's Zynq™ UltraScale+™ RFSoc to support demanding RF applications in 5G Communication, Phased-Array Radar solutions, and Quantum Computing.
- The module pushes the boundaries of FPGA technology for RF-based systems, combining high performance and flexibility with swift and simple integration.
- Eight digital-to-analog and analog-to-digital radiofrequency converters enable direct synthesis of RF signals with no additional analog circuitry.
- Watch [Andromeda XRU50 RFSoc Video](#).

Nuremberg, Germany, March 11, 2025. At Embedded World 2025, Enclustra announced the launch of its Andromeda XRU50 radiofrequency system-on-chip (RFSoc) module, which provides revolutionary RF performance and programmability in a compact and power-efficient package. The module extends the capabilities of its onboard AMD's Zynq™ UltraScale+™ RFSoc, designed to provide a complete, single-chip software-defined radio platform. The Andromeda XRU50 supports demanding RF applications, including 5G Wireless Communication, Phased-Array Radar, and Quantum Computing.

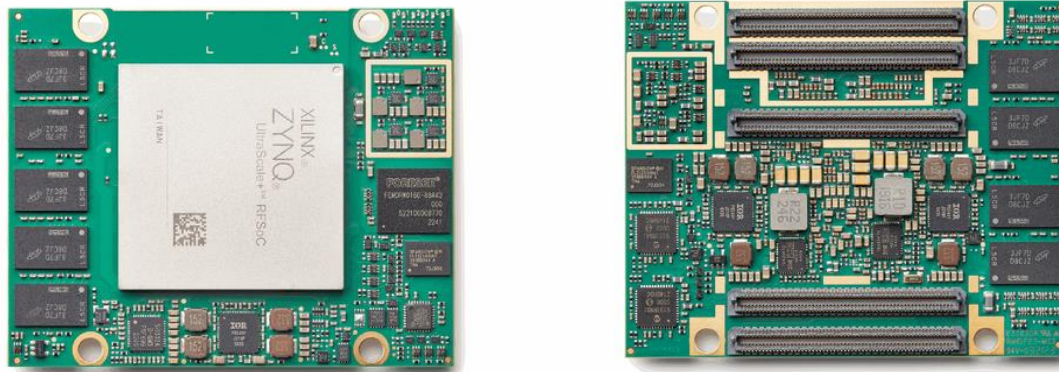
"Demand for enhanced RF signal processing capabilities is soaring, particularly for size-constrained, decentralized solutions," says Gaël Paul, Vice President for Innovation, at Enclustra. "Our response to this trend is the Andromeda XRU50 RFSoc, which effectively streamlines the development of the next generation of sophisticated FPGA-based RF systems."

Delivering next-level RF performance

The Andromeda XRU50 RFSoc simplifies the integration of AMD's Zynq™ UltraScale+™ RFSoc into end products. The AMD platform combines FPGA fabric with 930 thousand system logic cells, four Cortex-A53 1.3 GHz processors, two Cortex-R5F 533 MHz processors, and eight digital-to-analog and analog-to-digital radiofrequency converters, offering ample performance and flexibility to adapt to evolving requirements.

The 80-by-64-millimeter Andromeda XRU50 provides product developers easy access to the Zynq™ UltraScale+™ RFSoc's 200+ programmable logic I/Os, 20 multi-gigabit transceivers, and 32 GB of on-module memory. Support for Gigabit Ethernet, USB 3.0, and PCIe, and DDR4 memory interfaces ensures flexible system connectivity.

Future product variants will offer 16 digital-to-analog and analog-to-digital radiofrequency converters.



Andromeda XRU50 RFSoc – front and back; Small form factor Andromeda L 80 × 64 mm

Pushing the boundaries of FPGA to enable emerging applications

The Andromeda XRU50 RFSoc's architecture is designed from the ground up to unleash the full potential of 5G Wireless Communication networks, facilitating the deployment of massive MIMO antennas and beamforming arrays. Enabling dynamic and adaptive beamforming can enhance radar systems' performance for tracking and identifying targets. In the realm of quantum computing, RFSoc technology plays a crucial role. Its high-speed, low-latency processing enables the generation of precise microwave pulses, essential for controlling the state (0 or 1) of qubits in quantum computers.

Despite its small form factor, the module's meticulous design minimizes crosstalk between adjacent digital-to-analog converter channels, pushing the boundaries of FPGA technology and ensuring dependable performance in challenging signal environments.

Available for testing and validation

The dedicated Andromeda PB5 baseboard facilitates testing and seamless implementation of Andromeda SoC modules. It features extensive I/O interfaces and offers a robust platform to efficiently evaluate and integrate solutions with up to six individual Andromeda modules.

An additional RF front-end board featuring 22 RF connectors and integrated RF clock management facilitates interfacing with the FPGA module's RF capabilities. In addition to accelerating RF-based system development, the board maximizes flexibility to meet wide-ranging RF requirements while ensuring high-quality signal transmission.

Early Access Program

The Andromeda XRU50 RFSoc module is available today through an [Early Access Program](#) that lets end device manufacturers gain first experiences with its unique features, while engineering samples offer easy access to the most common interfaces.

To learn more about the Andromeda XRU50 RFSoc, head over to the [Andromeda XRU50 RFSoc product page](#) and reach out to discuss your project via our [Design Services enquiry form](#).

About Enclustra GmbH

Enclustra is an innovative, dynamic, and growing company for FPGA design with headquarters in Zurich, Switzerland, with subsidiaries in Germany, France, USA, and China.

As a leader in FPGA design and development, Enclustra offers a product portfolio of FPGA-based electronic modules and FPGA-optimized IP solutions for industrial customers and R&D organizations. In parallel, Enclustra provides leading engineering services in FPGA system design, covering the entire spectrum of FPGA-based system development: from high-speed hardware or HDL firmware to embedded software, from system design, specification, and implementation to prototyping.

Leveraging our expertise in cutting-edge FPGA technology and diverse application knowledge, Enclustra delivers high-performance solutions across various industries, minimizing development effort and accelerating your time-to-market.

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