

# NSITEXE develops "DR4100" General Purpose Accelerator for SoC

RVV1.0 compliant vector processor and multi-threaded scalar processor for a wide range of automotive and industrial applications

NSITEXE, Inc. (Head Office: Minato-ku, Tokyo; CEO: Yukihide Niimi; hereinafter "NSITEXE") is pleased to announce the "DR4100", a high-end accelerator for the "Akaria" product brand, which focuses on processor IP for a wide range of next-generation embedded systems.

Efficient execution of AI and other computing on edge devices, which are exposed to severe heat stress and subject to cost constraints, has become an important factor in the embedded systems to realize a mobility society connecting people and cars, smart cities connecting people and cities, and in the industrial area, CPS (Cyber Physical System) linking virtual spaces and the real world more closely by utilizing computers.

NSITEXE provides Akaria processors that support a wide range of embedded systems to address this challenge. Akaria processors combine RISC-V-based Standard Processors with Extension Unit components to provide the optimal Domain Specific Accelerator for each customer application.

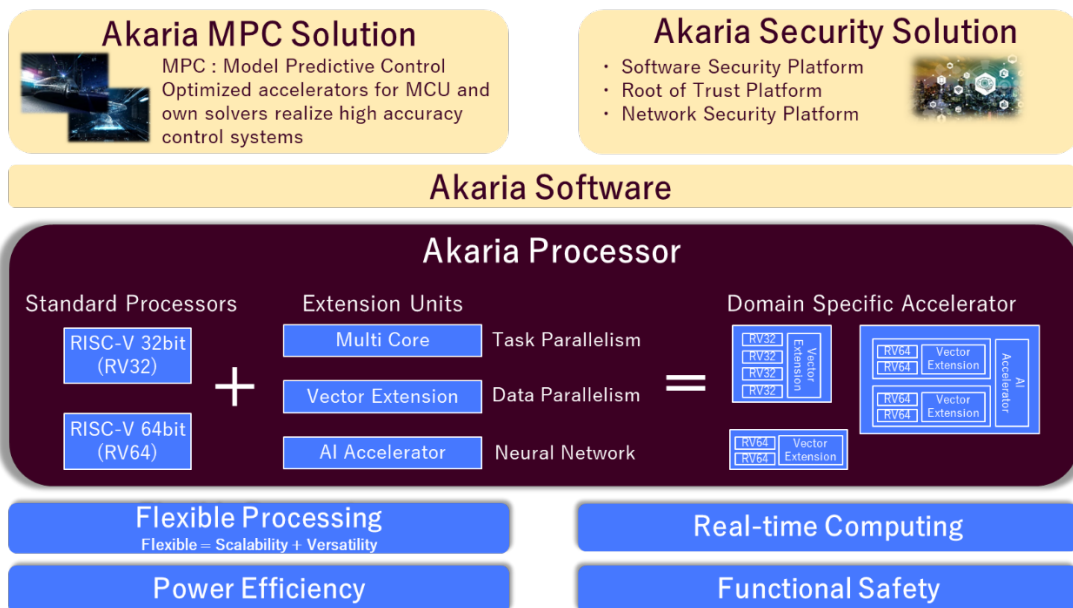
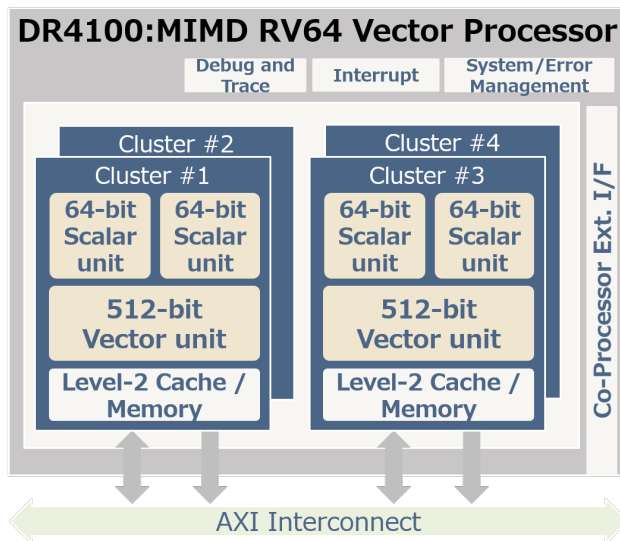


Figure 1 Akaria Overview

The Akaria processors include the NS family as Standard Processors and the DR family as Domain Specific Accelerators. The DR family includes the DR1000 series of accelerators for control microcontrollers, the DR4000 series of

accelerators for high-end applications such as autonomous driving, and the ML series specialized for neural networks.

We are pleased to announce the DR4100, the newest addition to the DR4000 series, which offers data parallelism with the RISC-V Vector Extension v1.0 and task sequencing with multi-threading using scalar processors. As a highly versatile MIMD-based accelerator, the DR4100 achieves a processing performance of 400 GFLOPS/1.6 TOPS, making it a general-purpose accelerator that can be applied to a wide range of applications, from automotive applications such as autonomous driving to industrial applications for smart factories.



- Efficient 64-bit Scalar units
  - 10+ stages 3-way Out-of-Order
  - Hardware multithreading (up to 2 harts)
- Four 512bit vector units
  - 2 arithmetic pipelines/unit
  - 8192 bits width vector register
  - 8 banked physical vector register
  - 1.6TOPS@Int8(@1.6GHz)
- L2 Cache
  - Coherent-enabled
  - 128KB~ 2 MB w/ECC

Figure 2 DR4100

The development environment also supports heterogeneous multi-core environments such as OpenCL and SYCL to facilitate application development.

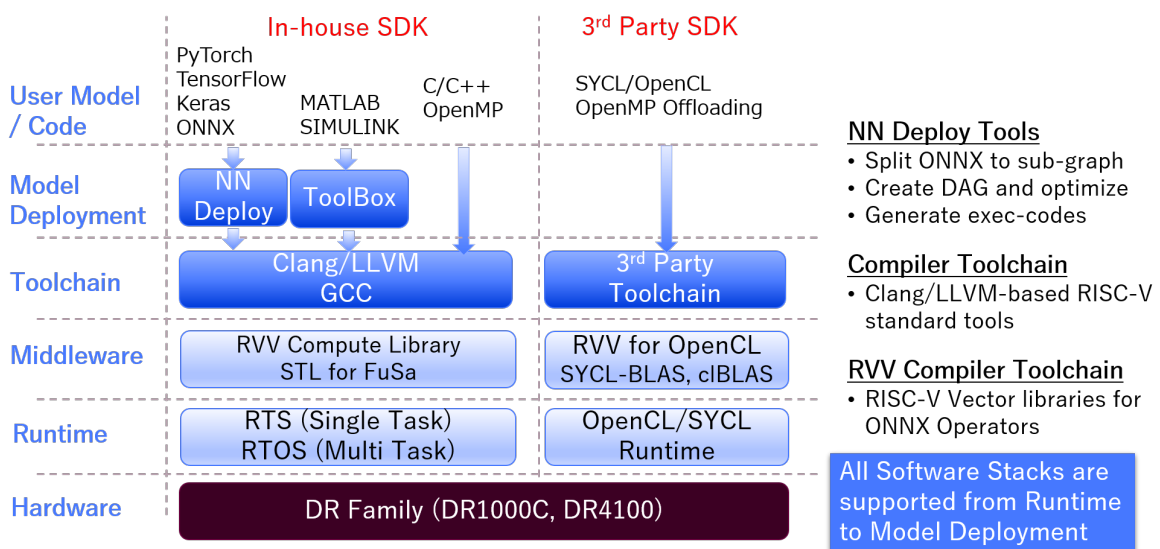


Figure 3 SDK of DR4100

**Hideki Sugimoto, CTO, NSITEXE, Inc.**

NSITEXE has been developed based on the three pillars of versatility, efficiency,

and functional safety in consideration of major future trends, and Akaria will create and grow as a brand that encompasses not only hardware IP, but also software and solutions for our entire processor technology offering value to customers. Akaria is a brand name that we will create and grow as a brand that offers value to our customers. The DR4100 is a general-purpose accelerator for high-end applications such as autonomous driving and smart factories, and will serve as a development platform to support a wide variety of next-generation applications.

The DR4100 developed this time has been commercialized by utilizing the results obtained from a project, JPNP16007, commissioned by the New Energy and Industrial Technology Development Organization (NEDO).

In addition, Masayuki Ito, Director of Business Promotion, will give a presentation on the DR4100 at the IEEE Asian Solid-State Circuits Conference 2022 (A-SSCC 2022) Industry Forum to be held in Taipei, Taiwan on November 8.

<https://www.a-sscc2022.org>

\*This event will be held as a hybrid of on-site and virtual event.

Based on Akaria's innovative processor technology, NSITEXE hopes to contribute to innovations in the area of mobility, smart cities and CPS that enrich people's lives.

### **About NSITEXE**

NSITEXE is an IP vendor that develops advanced processors, including RISC-V based processor IP for functional safety and, was established in 2017 as a spin-off from DENSO Corporation. High-efficiency, high-quality semiconductor IP addresses a wide range of applications and contributes to the evolution of next-generation semiconductor technology.

### **If you have any questions about this press release, please contact:**

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