Nanoveu Limited
ACN 624 421 085
Level 45, 108 St Georges Terrace
Perth WA, 6000 Australia
+61 8 6244 9095
www.nanoveu.com

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ASX: NVU

Nanoveu Reaches Final GDS Stage for 16nm ECS-DoT SoC, Strengthening Leadership in Ultra-Low-Power Edge AI

Full 16nm front-end, synthesis and physical design completed, marking a key inflection point for next-generation ultra-low-power Edge AI platform

Highlights

- EMASS's next-generation 16nm ECS-DoT Edge AI SoC has completed front end design, synthesis and physical design, and is now in the final GDS (graphic data system) sign-off stage ahead of tape-out and fabrication at TSMC, advancing Nanoveu's Atoms-to-Apps silicon roadmap.
- **EMASS is setting the pace among Edge AI SoC peers by delivering an ultra-low-power 16nm AI SoC** purpose-built for always-on edge intelligence and wireless modules, positioning Nanoveu at the forefront of advanced-node Edge AI silicon.
- New 16nm architecture integrates an on-chip **Bluetooth Low Energy (BLE) subsystem**, eliminating the need for external wireless ICs and reducing board complexity and bill-of-materials cost.
- Substantially **expanded on-chip SRAM** supports larger neural networks, higher-throughput vision and sensor workloads, and reduced off-chip accesses for improved energy efficiency.
- A new **adaptive fine-grained power-management fabric** enables always-on intelligence with microsecond wake-up behaviour for battery-powered and energy-harvesting applications (without using DVFS).
- Dedicated **AI acceleration module for object detection** is designed to speed up lightweight on-device vision models (e.g. YOLO-Nano, MobileNet-SSD heads, FOMO-style detectors), lowering latency and boosting throughput for edge vision use cases.
- Integration of a new **hardware floating-point unit (FPU)** with FP16/FP32 support enhances DSP performance, mixed-precision AI workflows and developer experience across compilers and libraries.
- This advanced 16nm SoC has been advanced by a highly focused IC design team, underscoring EMASS's ability to execute complex semiconductor programs with exceptional efficiency.

Nanoveu Limited (ASX: NVU, OTCQB: NNVUF) (Nanoveu or the Company), a technology innovator across advanced semiconductor, visualisation and materials science applications, is pleased to advise that its wholly owned subsidiary, Embedded A.I. Systems Pte. Ltd (**EMASS**), has achieved a major milestone in the development of its next-generation 16nm ECS-DoT AIoT system-on-chip (**SoC**).

The 16nm ECS-DoT SoC has now completed the full front end, synthesis and physical design flow and has entered final GDS (Graphic Data Stream) sign-off, placing EMASS at the final stage ahead of tape-out and fabrication at TSMC. Reaching this point represents a decisive transition from design execution to silicon realisation in advanced-node semiconductor development. **The next-generation SoC unifies wireless connectivity, expanded memory, enhanced AI acceleration and advanced low-power capabilities into a single, ultra-efficient edge intelligence platform.**

Key Enhancements in the 16nm ECS-DoT SoC

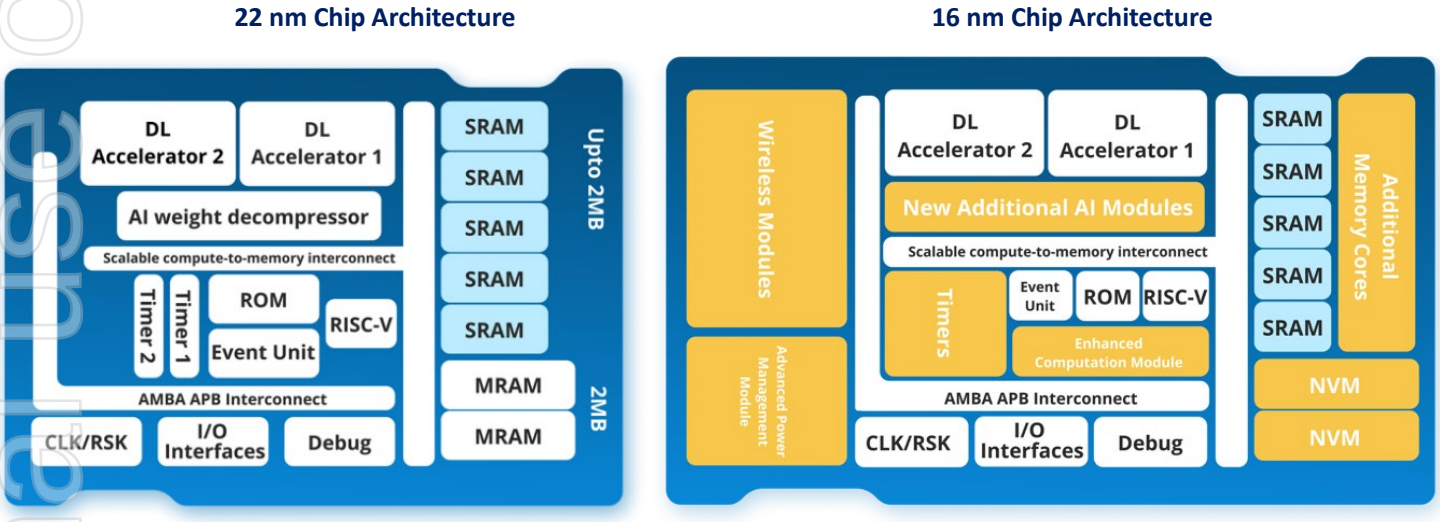

Figure 1. *Technical Schematic diagrams of the 22nm and 16nm ECS-DoT architecture, illustrating the addition of new AI, wireless, power-management and memory subsystems while also providing 50% area benefits with simultaneous 25% power benefits.*

1. Fully Integrated Bluetooth Low Energy Subsystem (Analog + RF)

ECS-DoT integrates a Bluetooth Low Energy (**BLE**) subsystem directly on-chip, incorporating the full analog and RF signal chain. This includes the analog front end, RF transceiver, PLLs and on-chip matching networks.

By bringing the entire BLE path into the SoC, EMASS aims to:

- Eliminate the need for external wireless ICs in many designs;
- Reduce board area, bill-of-materials (BoM) cost and design complexity; and

This integration positions ECS-DoT as a more self-contained platform for wearables, industrial sensors, trackers and other connected devices where PCB footprint and power are at a premium.

2. Expanded On-Chip Memory

The 16nm ECS-DoT features a major increase in on-chip SRAM capacity compared to prior generations. The expanded memory is designed to:

- Support larger and more complex neural networks;
- Enable higher-throughput vision and multi-sensor fusion workloads; and
- Reduce reliance on off-chip memory, improving both latency and energy efficiency.

This upgrade strengthens the platform's suitability for more demanding AI applications and lays the foundation for potential future variants that may incorporate emerging non-volatile memory technologies.

3. New Adaptive Fine-Grained Power-Management Architecture

The new device introduces EMASS's most advanced power-management fabric to date. The architecture includes:

- Fine-grained power gating across key functional domains;
- Dynamic clock gating for workload-aware optimisation;
- Autonomous low-power states managed through internal controllers; and
- Microsecond-level sleep/wake behaviour designed for always-on monitoring.

Importantly, this design does **not** rely on dynamic voltage and frequency scaling (**DVFS**), instead focusing on architectural and circuit-level techniques to minimise power. This approach is intended to enable ultra-low-power intelligence suitable for battery-powered and energy-harvesting scenarios across wearables, smart tags, industrial sensors and environmental monitoring.

4. Dedicated AI Acceleration Module for Object Detection

To broaden its AI capabilities beyond general inference, the 16nm ECS-DoT adds a dedicated compute engine optimised for **real-time object detection**.

This accelerator is designed to support and speed up lightweight vision models such as:

- YOLO (You Only Look Once)-Nano-class architectures;
- MobileNet-SSD style detection heads; and
- FOMO (Faster Objects, More Objects)-style event and object detectors.

By offloading these workloads from the main cores, the new engine aims to deliver higher throughput and lower inference latency for edge vision use cases, including drones, smart cameras, retail analytics, safety systems and industrial inspection.

5. Integrated Floating-Point Unit (FPU)

For the first time in the ECS-DoT family, the 16nm generation incorporates a hardware floating-point unit supporting **FP16 and FP32** operations.

The FPU is designed to:

- Accelerate digital signal processing (DSP) and algorithmic kernels;
- Enable mixed-precision AI workflows where portions of the pipeline may benefit from floating-point; and
- Improve developer experience through better alignment with existing toolchains, libraries and frameworks that assume native floating-point support.

This addition broadens the range of applications that can be efficiently ported to ECS-DoT and simplifies migration for developers working with existing floating-point codebases.

Silicon Validation and Benchmarking

Following tape-out and receipt of first 16nm ECS-DoT silicon from TSMC, EMASS will undertake a structured silicon validation and characterisation program covering power, performance and functional reliability across Edge AI workloads.

Upon completion, the Company expects to release a summary of measured power and performance metrics based on silicon data. This disciplined approach ensures that any reported metrics are grounded in validated hardware behaviour under representative real-world operating conditions, rather than pre-silicon projections or simulation-only estimates.

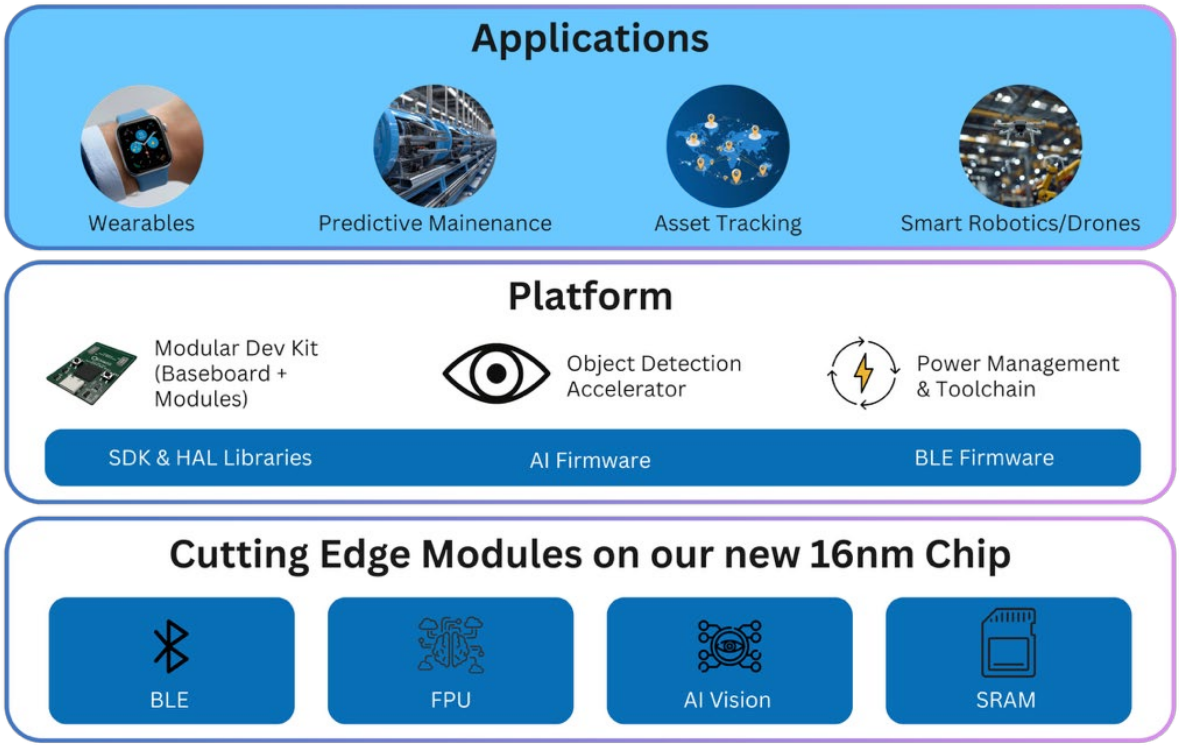

***Figure 2**. EMASS's Atoms-to-Apps edge intelligence stack, showing how the 16nm ECS-DoT SoC, platform software and development tools enable deployment across predictive maintenance, healthcare wearables, asset tracking and smart robotics/drones.*

A Major Step Toward Next-Generation Edge Intelligence

With these architectural advancements, the 16nm ECS-DoT evolves from a specialised AI core into a fully integrated edge intelligence SoC, combining:

- Compute and AI acceleration;
- Wireless communication;
- Expanded on-chip memory; and
- An advanced low-power fabric

into a single, tightly integrated platform.

This highlights EMASS's Atoms-to-Apps methodology, where architecture, algorithms, hardware and system design are co-optimised from the outset to enable rapid innovation.

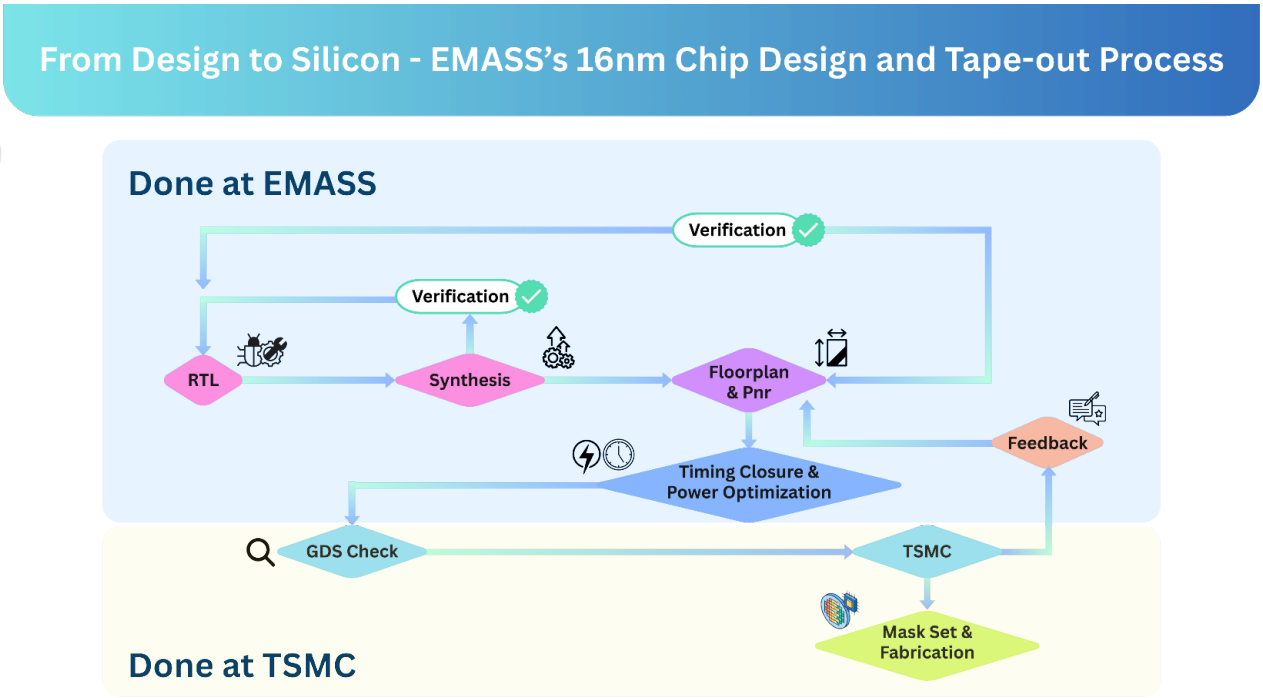

Figure 3. *Conceptual Image illustrating the tape-out process.*

Dr. Mohamed M. Sabry Aly, Founder of EMASS and Director of Nanoveu, commented: "*This major milestone reinforces EMASS's commitment to delivering cutting-edge, energy-efficient AI silicon designed from the ground up for real-world deployment. Reaching the final stages of GDS for our 16nm ECS-DoT SoC is not only a validation of our Atoms-to-Apps design philosophy, but it also marks an important step towards bringing the next generation of edge intelligence to our partners and customers*."

Nanoveu will provide further updates as ECS-DoT progresses through final GDS sign-off, tape-out, fabrication and subsequent silicon validation.

This announcement has been authorised for release by the Board of Directors.

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Nanoveu Media
Alfred Chong, Nanoveu MD and CEO
P: +65 6557 0155
E: info@nanoveu.com

About Nanoveu Limited

Further details on the Company can be found at https://nanoveu.com/.

EMASS is a pioneering technology company specialising in the design and development of advanced systems-on-chip (SoC) solutions. These SoCs enable ultra-low-power, AI-driven processing for smart devices, IoT applications, and 3D content transformation. With its industry-leading technology, EMASS will enhance Nanoveu's portfolio, empowering a wide range of industries with efficient, scalable AI capabilities, further positioning Nanoveu as a key player in the rapidly growing 3D content, AI and edge computing markets.

EyeFly3D™ is a comprehensive platform solution for delivering glasses-free 3D experiences across a range of devices and industries. At its core, EyeFly3D™ combines advanced screen technology, sophisticated software for content processing, and now, with the integration of EMASS's ultra-low-power SoC, powerful hardware.

Nanoshield™ is a self-disinfecting film that uses a patented polymer of embedded Cuprous nanoparticles to provide antiviral and antimicrobial protection for a range of applications, from mobile covers to industrial surfaces. Applications include *Nanoshield™ Marine*, which prevents the growth of aquatic organisms on submerged surfaces like ship hulls, and *Nanoshield™ Solar*, designed to prevent surface debris on solar panels, thereby maintaining optimal power output.

Forward Looking Statements This announcement contains 'forward-looking information' that is based on the Company's expectations, estimates and projections as of the date on which the statements were made. This forward-looking information includes, among other things, statements with respect to the Company's business strategy, plans, development, objectives, performance, outlook, growth, cash flow, projections, targets and expectations and related expenses. Generally, this forward-looking information can be identified by the use of forward-looking terminology such as 'outlook', 'ambition', 'anticipate', 'project', 'target', 'potential', 'likely', 'believe', 'estimate', 'expect', 'intend', 'may', 'mission', 'would', 'could', 'should', 'scheduled', 'will', 'plan', 'forecast', 'evolve' and similar expressions. Persons reading this announcement are cautioned that such statements are only predictions, and that the Company's actual future results or performance may be materially different. Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the Company's actual results, level of activity, performance, or achievements to be materially different from those expressed or implied by such forward looking information.