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ASX: NVU

EMASS Achieves Always-On Keyword Spotting for Next-Generation Hearables

Reference design integrates STMicroelectronics inertial sensing with EMASS ECS-DoT on-device AI to enable ultra-low-power voice interaction in hearable devices

Highlights

- EMASS successfully co-develops reference design combining STMicroelectronics (ST) inertial measurement unit (IMU) technology, the LSM6DSV16BX, with EMASS's ECS-DoT edge-AI System-on-Chip (SoC) for hearable applications.

- The reference design enables always-on keyword spotting in bone-conduction hearables, combining ST's motion-triggered wake-up detection with EMASS's on-device AI inference to deliver hands-free voice interaction at sub-milliwatt power levels.

- ECS-DoT delivers sub-milliwatt operation and sub-10ms response latency, enabling engineers to add intelligent voice recognition to hearable designs without impacting battery life or user experience.

- The market targets the rapidly growing hearable and wearable market, projected to exceed US$232 billion by 2030[1], where always-on, low-power voice interaction is a critical differentiator.

- The reference design will be showcased live at Embedded World 2026 (Nuremberg, Germany), with EMASS demonstrating the integrated system at Hall 4, Booth 4-483 during 11-13 March 2026.

Nanoveu Limited (ASX: NVU, OTCQB: NNVUF) (Nanoveu or the Company), a technology innovator across advanced semiconductor, visualization, and material science, is pleased to announce the reference design for bone-conduction hearable applications by its wholly-owned subsidiary, Embedded A.I. Systems Pte Ltd (EMASS).

The reference design integrates ST's inertial measurement unit (IMU) technology with EMASS's ECS-DoT AI-enabled System-on-Chip (SoC), creating a complete, power-optimised pipeline for always-on keyword spotting in wearable devices. ST's motion sensing capability triggers system activation when jaw movement is detected, while ECS-DoT performs real-time keyword recognition directly on the device — eliminating the need for continuous microphone monitoring or cloud-based processing.

Why This Reference Design Matters

Today's hearable devices face a fundamental engineering challenge: delivering responsive, hands-free voice interaction without draining battery life. Continuously active microphone monitoring and cloud-dependent keyword detection create unacceptable power overhead for battery-powered wearables, limiting practical always-on capability.

ST's MEMS IMU technology, the LSM6DSV16BX, provides a proven, ultra-efficient mechanism for detecting meaningful physical signals such as jaw movement. By using this motion signal to wake the audio subsystem only when the user is likely speaking, idle power draw is dramatically reduced. EMASS's ECS-DoT then handles the computationally intensive task of keyword recognition entirely on-device, at sub-milliwatt power and sub-10ms latency, without transmitting data to the cloud.

The result is an integrated reference design that enables a new class of hearable product capability. For engineers and OEMs, this translates into:

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[1] GlobalData, February 2026

- **Always-on voice activation without battery penalty:** Motion-triggered wake-up ensures the system is active only when needed, extending battery runtime significantly compared to continuously-on approaches.

- **No cloud dependency:** Keyword recognition runs entirely on-device, eliminating latency, privacy concerns, and recurring cloud processing costs.

- **Sub-10ms response:** Local inference means voice commands are acted on in real time, with no perceptible delay for the end user.

- **Validated system blueprint:** The reference design gives product teams a fast-track path to integrate always-on voice interaction into hearable and wearable products.

Reference Design Details and Demonstrations

The hearable reference design demonstrates a complete, validated system pipeline for always-on voice interaction in bone-conduction hearable devices:

- **Motion-Triggered Activation:** ST's IMU monitors jaw movement to detect user intent, waking the audio processing subsystem only when interaction is likely — eliminating idle power draw from continuous microphone monitoring.

- **On-Device Keyword Spotting:** EMASS's ECS-DoT performs real-time audio classification and keyword recognition locally on the device, with no cloud dependency and sub-10ms response latency.

- **Ultra-Low Power Operation:** The combined solution targets sub-milliwatt system power in standby, enabling always-on intelligence in battery-powered hearable devices without compromising battery life or device form factor.

"Hearables represent one of the fastest-growing segments for always-on edge AI, and this reference design demonstrates how purpose-built AI silicon can deliver capabilities that weren't previously practical in wearable form factors," said Mark Goranson, Nanoveu's CEO of Semiconductor Technologies. *"By pairing ST's proven inertial sensing with ECS-DoT's on-device AI, we're giving engineers a clear path to add intelligent, low-power keyword spotting to bone-conduction and other hearable designs."*

EMASS will demonstrate the reference design live at Embedded World 2026 (Nuremberg, Germany, 11–13 March 2026). Attendees can experience the integrated system at EMASS's booth in **Hall 4, Booth 4-483**.

What this means for Nanoveu / EMASS

- **Expanded hearable and wearable market opportunity**: The hearable market is one of the fastest-growing segments in consumer electronics. This reference design positions EMASS to capture design-in opportunities with product teams targeting always-on voice interaction in bone-conduction earphones, hearing aids, smart glasses, and other wearable platforms.

- **Demonstration of multi-modal AI differentiation**: By combining motion sensing with audio AI inference, the reference design showcases ECS-DoT's ability to orchestrate multiple sensor modalities — a core differentiator versus single-modality competitors.

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

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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.