DorsaVi Ltd

Investment Report

August 2025

PHOENIX
GLOBAL INVESTMENTS

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About: DorsaVi Limited

Overview

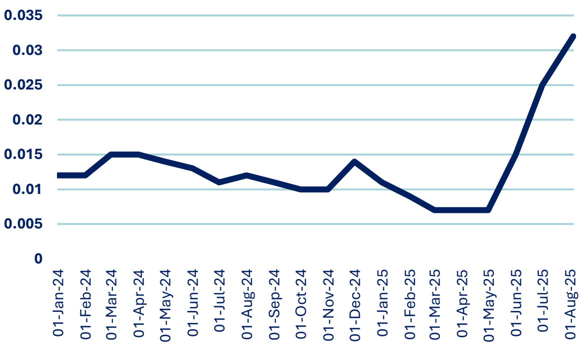
DorsaVi Ltd (ASX: DVL) is an Australian-based med-tech company that has historically focused on biomechanical sensor solutions for clinical, sports, and occupational safety applications. The company's proprietary wearable motion sensors, combined with data analytics, enable real-time measurement of human movement. DorsaVi transformed its strategy by acquiring exclusive global rights to a breakthrough memory technology developed by Nanyang Technological University (NTU), Singapore – Resistive Random Access Memory (RRAM). This pivot has repositioned DorsaVi as a hybrid med-tech and deep-tech company, targeting high-margin opportunities in semiconductor IP, edge computing, and embedded AI applications.

Share Price: 0.0320

ASX: DVL
Sector: Technology
05 August 2025

Metrics	Value
Valuation Measures	
Market Cap	AUD 29.16M
Enterprise Value	AUD 28.05M
Share Information	
Shares Outstanding	911.2M
52 week high/low (A$)	$0.0330 / $0.0060
% held by Board and Management	37%

ASX: DVL Share price (A$)



Source: Yahoo Finance

Key Products and Technologies

DorsaVi Becomes a Robotics Company: Neuromorphic Reflex Platform Powered by RRAM

DorsaVi is no longer just a wearable sensor company. It is now making a bold move to become a robotics-first technology company. At the centre of this transformation is its exclusive license to advanced Resistive RAM (RRAM) technology from NTU Singapore, which underpins DorsaVi's next-generation robotics reflex platform.

The company's mission now focuses on improving how robots sense and react. DorsaVi's RRAM-powered systems are designed to deliver ultra-fast, low-power reflexes, essential for the next wave of collaborative robots, prosthetics, and autonomous machines.

Engineered for Robotics Reflex: RRAM enables sub-millisecond response times, already demonstrated in robotic use cases such as soft grippers, exosuits, and mobile robots. These systems detect contact and react faster than traditional safety systems, offering better protection and control.

Robotics Platform Evaluation Underway: In July 2025, DorsaVi began a full technical and commercial evaluation of its "reflex silicon" under robotic conditions. Testing includes measuring latency, actuator control, and power efficiency. Results from this evaluation are expected within four weeks.

Targeted Robotic Applications

- Fast slip detection and grip control in robotic hands
- Reflex motor control for robotic arms and humanoid machines
- On-device EMG and ECG processing for prosthetics and assistive wearables
- Smarter, quicker decision-making in mobile robots

Neuromorphic Computing at the Edge: The RRAM architecture supports analog matrix–vector multiplication, which allows real-time decision-making right where sensing happens. This is critical for robots that need fast, accurate reflexes.

Built for Efficiency: The platform runs on microwatt-level power and wakes up instantly when needed, ideal for battery-powered, always-on robotic and wearable systems.

Manufacturing-Ready: DorsaVi's RRAM has been validated on 40nm CMOS with GlobalFoundries, making it suitable for integration into commercial ASICs and robotics systems today.

This shift in strategy marks a clear move. DorsaVi is committing to the future of robotics, with embedded intelligence and patented technology designed to improve safety, control, and performance across a broad range of robotic platforms.

NTU RRAM Technology and DorsaVi Strategic Partnership

Overview

DorsaVi's strategic partnership with Nanyang Technological University (NTU), one of global top-ranked research institutions, marks a turning point in the company's technological and commercial trajectory. This collaboration enables DorsaVi to expand beyond its legacy in motion analytics into the domain of advanced memory semiconductors.

The agreement with NTU grants DorsaVi exclusive access to a comprehensive portfolio of **nine background intellectual property (BG IP)**, covering patented innovations in oxide-based RRAM architectures, selector-less designs, and oxygen-gradient materials engineering. In addition, DorsaVi is a co-developer of **foreground IP (FG IP)** under a structured joint research roadmap, allowing for joint invention of new technologies with the option to secure exclusivity for commercial applications.

DorsaVi holds exclusive rights to deploy this technology in a wide range of high-growth verticals, including:

- Artificial Intelligence (AI) accelerators and embedded systems
- Spatial Computing (AR, VR,XR)
- Edge computing
- Internet of Things (IoT) devices
- Automotive
- Robotics
- Wearables
- Health-tech
- Drones

This transformative deal is underpinned by a sophisticated, milestone-driven commercialisation framework structured to ensure both flexibility and long-term value creation for DorsaVi:

- **Upfront Evaluation and Due Diligence**: DorsaVi immediately benefits from access to detailed technical documentation, patent disclosures, and lab data, with collaborative technical assessments and IP validation conducted by both DorsaVi and NTU's expert teams.
- **Staged Licensing and Maintenance Payments**: The agreement sees manageable staged payments SGD$400,000 across the first two years and SGD$700,000 over the following decade enabling DorsaVi to maintain full access to NTU's background IP and ongoing R&D, while providing regular technical updates, prototype access, and benchmarking support from NTU's leading-edge semiconductor facilities.
- **Optional Field-Specific Exclusivity**: DorsaVi gains strategic flexibility with robust territorial protections and can trigger fully exclusive rights in defined application verticals, such as edge AI, automotive, and health wearables, upon milestone-linked payments ensuring strong competitive insulation in these pivotal domains.
- **No Ongoing Royalties**: There are no recurring royalties or revenue splits on commercial sales. This capital-light structure empowers DorsaVi to efficiently monetise the IP through direct sales, licensing, and co-branded RRAM-integrated devices, maximising profit margins and supporting predictable, scalable revenue streams.
- **Industry-Leading Innovation Pipeline**: Backed by over a decade of NTU's research and the leadership of renowned Professor Lew Wen Siang, the patented RRAM portfolio features advances such as ultra-stable, low-voltage multi-layer architectures, robust plasma-enhanced interfaces, and simulation models for rapid hardware development. These innovations bolster DorsaVi's competitive advantage and provide broad opportunities for market expansion and defensible licensing.

By leveraging NTU's proven RRAM research and fabrication partnerships, including with GlobalFoundries and the Singapore National Research Foundation, DorsaVi is positioned to commercialise a globally competitive memory IP stack without the capital burden of building and operating semiconductor foundries.

This partnership lays the foundation for DorsaVi's transformation into a deep-tech IP leader. It provides the company with a robust innovation pipeline, valuable defensive IP, and licensing opportunities in critical markets where data security, energy efficiency, and AI performance are paramount.

NTU's IP stack includes 9 global patent families and several confidential know-how assets:

- **Filed Patents**: Cover oxide gradient engineering, oxygen-scavenging layers, multi-layered memory stacks, and ion-blocking barrier structures , all core to high-performance RRAM.

- **Filed Know-How**: Includes advanced fabrication methods, SPICE modeling libraries for circuit designers, and variation-tolerant sensing circuits that improve performance predictability.

- **Global Coverage**: Patents filed under PCT and in major jurisdictions such as the U.S., Europe, and Singapore ensuring legal defensibility in key semiconductor markets.

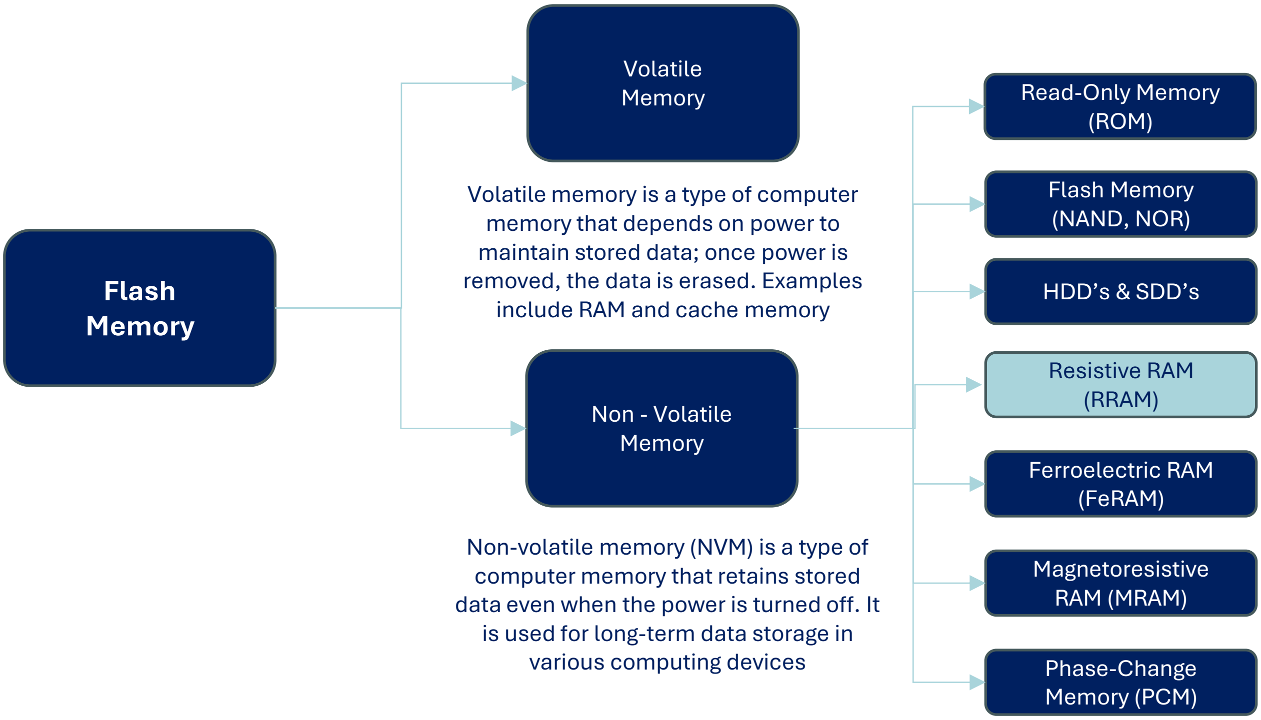
Key Patent and Know-How Assets in the NTU RRAM Portfolio

TD Ref	Title	Description
2021-239	Resistive Non-Volatile Memory with An Oxygen Gradient and Methods Of Fabricating The Sam	Provided as an electrically actuated resistive non-volatile memory and the method of fabricating the same. The resistive memory device comprises a first electrode, a second electrode, a buffer layer, and a primary memory layer disposed there between. Oxygen gradient is configured across the multiple layers. The memory device is advantageous because it can provide a multilayer memory cell structure with low power consumption, stable resistive switching and simple fabrication processes
2021-392	Non-Volatile Memory Containing Oxygen Scavenging Material Portions and Methods Of Making The Same	The invention provides for a resistive non-volatile memory comprising of oxygen scavenging materials. An exemplary embodiment of a non-volatile memory is included. In the present invention, a non-volatile memory with both stable resistive switching and high thermal budget can be achieved.
2022-316	Thin Film Multi-Layered Resistive Switching Memory Elements and Methods Of Fabricating The Same	The present invention relates a resistive switching memory element composed of thin films with multiple layers: main switching layer, a first and second electrode, a scavenger layer and a diffusion barrier layer. The main switching layer includes repeated units, and each unit has both barrier and active layer.
2022-377	Resistive Switching Memory Device with An Ion Obstruction Barrier Layer and Fabrication Method Thereof	An object of the present invention is to provide a resistive non-volatile memory device that are more reliable and have low operation voltages. According to the present invention, a resistive non-volatile memory device comprises a first electrode, a second electrode facing the first electrode and a resistive switching layer disposed between the first and second electrode. The resistive switching layer has multiple layers of metal oxide, with the first region as a buffer layer, the second region as the primary switching layer, and the third region as an ion obstruction barrier layer.
2023-276	Memory Device, Plasma Treatment, and Thermal Stability Improvement Thereof	This invention relates to use of novel plasma treatment on metallic electrode layer of oxide-based resistive switching memory cells. The plasma treatment improves thermal stability of the memory cell devices as well as its memory performance. The memory cell devices consist of an oxide resistive switching layer sandwiched between active and inert electrode. In the present invention, non-volatile memory cells with high thermal stability and high performance are demonstrated
2023-277	Memory Device, Via Oxygen Scavenging Electrode, and Methods Of Making The Same	This invention relates to novel oxide-based resistive switching memory cells and their integration approach with a transistor as a select device for memory array implementations. The reported memory cell devices exhibit excellent improvement in terms of memory window and variation under the controlled oxygen gradient across layers and incorporation of insertion layer. Highly reliable switching performance and thermal stability are demonstrated.
2023-362	SPICE Modeling Of Resistive Random Access Memories	An improved model is developed through exploring the currently available SPICE models for oxide-based bipolar RRAM devices. The Monte Carlo model is added in the model library for simulating device-to-device variability. The simulation results show that the improved model is accurate and robust to simulate resistive switching behaviours. This has been applied in the large-scale memory array simulation by the IC design team of the inventors.
2023-411	Method For Fabricating Resistive Switching Memory Cells	Embodiments of a method for device fabrication of resistive switching memory cells. In the invention, an annular-shaped pattern may be formed with positive lithography resist, offering flexibility in addressing a wide range of fabrication requirements, including but not limited to improving resolution and tuning of mask transmission. In the present invention, device sizes from 1 μm to 200 nm memory device cells with high endurance and high performance are demonstrated.
2021-063	Variation Tolerant Sensing Scheme for Resistive Random Access Memory	The invention is about IC design scheme for memory array such as 512kb, 512 x 1024 cells for main array, 512 x 128 cells for parity bits, and 512 x 2 cells for replica array. There are 16:1 column MUX and reading 72 bits (64 data bits + 8 parity bits), and use of replica array for reference generation. The invention enables differential sensing for large margin and simple operation for non-volatile memory.

This diverse and defensible IP foundation provides DorsaVi with the tools to scale RRAM into high-performance and high-reliability applications across edge computing, embedded AI, automotive, and secure storage. For investors, this portfolio represents a key value driver, each patent family and proprietary know-how filing serves not just as a technological asset but as a commercial moat. As adoption of AI and IoT accelerates, owning exclusive memory IP becomes increasingly valuable for chipmakers and device integrators. This positions DorsaVi to generate long-term, recurring revenue through licensing agreements and OEM partnerships.

Moreover, because IP-based businesses often enjoy higher gross margins and require lower capital expenditure compared to traditional hardware companies, DorsaVi can scale without dilutive funding. As the company expands its licensing base and vertically integrates into its own product lines, investors gain exposure to a deep-tech, capital-light business model with asymmetric upside, driven by tangible, patent-backed innovation.

NTU’s RRAM Technology – Architecture, Advantages, and IP



Volatile memory is a type of computer memory that depends on power to maintain stored data; once power is removed, the data is erased. Examples include RAM and cache memory

Non-volatile memory (NVM) is a type of computer memory that retains stored data even when the power is turned off. It is used for long-term data storage in various computing devices

RRAM (Resistive Random Access Memory) is a next-generation non-volatile memory technology that stores data by changing the resistance of a dielectric material, offering a major leap forward over traditional charge-based technologies such as Flash. NTU’s RRAM platform, exclusively licensed to DorsaVi for targeted commercial applications, stands out for its advanced design, superior performance metrics, and CMOS-compatible fabrication process.

RRAM vs Competing Memory Technologies

Speed (Read/Write)

RRAM delivers exceptional performance with read speeds ranging from 1–10 GB/s and write speeds between 0.1–1 GB/s. This positions it at the high end of non-volatile memory technologies, outperforming NAND Flash and matching or surpassing both PCM and MRAM. Such high bandwidth capabilities make RRAM particularly well-suited for real-time inference engines, AI accelerators, and embedded edge systems where latency and throughput are critical.

Power Consumption

One of RRAM's most important advantages is its ultra-low power requirement. Operating at voltages below 2.5V, RRAM significantly reduces energy usage per operation compared to NAND Flash and PCM, which rely on high-voltage or thermally intensive mechanisms. This low energy footprint makes it ideal for power-sensitive applications such as always-on IoT nodes, smart wearables, and battery-operated health monitors.

Endurance (Write Cycles)

RRAM exhibits endurance beyond 1 million write/erase cycles, with NTU’s proprietary designs showing consistent performance above 10 million cycles. This greatly surpasses NAND Flash, which typically degrades after 10,000–100,000 cycles. Although MRAM offers unlimited endurance, it remains expensive and lower in density. RRAM strikes a strong balance, providing high endurance with economical fabrication at standard CMOS nodes.

Scalability and Integration

RRAM is fabricated at the 40nm node and is inherently compatible with standard CMOS processes, enabling easy integration into ASICs, SoCs, and microcontroller platforms. This contrasts with MRAM and NOR Flash, which are harder to scale due to process complexity or lower density. RRAM’s scalability supports monolithic system integration, especially for edge AI devices where compact design and embedded intelligence are priorities.

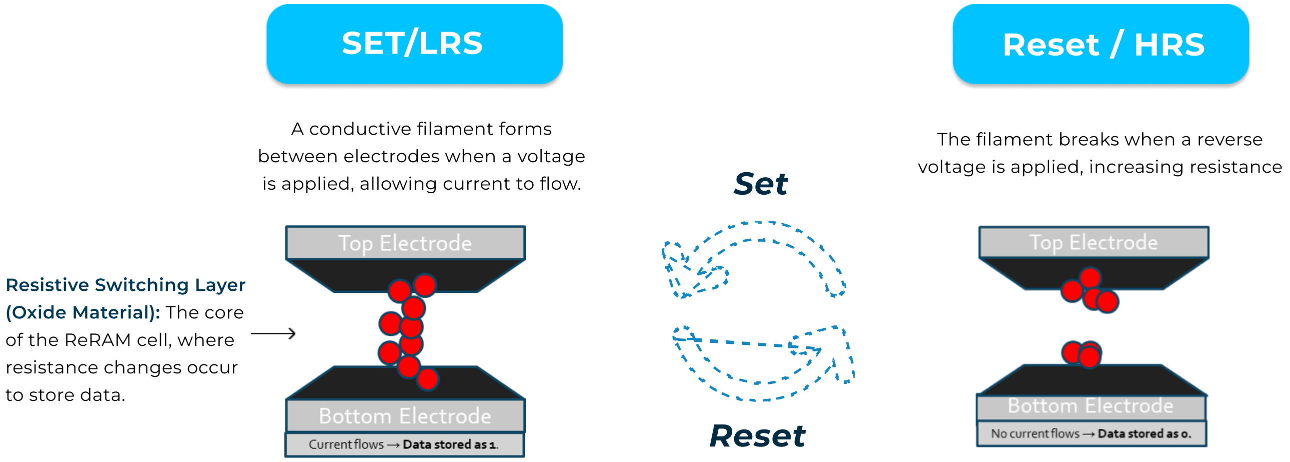
Use Cases

RRAM’s versatility allows it to serve across multiple high-growth markets: AI accelerators, storage-class memory for data centers, low-power embedded IoT modules, and secure wearables. Competing technologies often have a narrower focus e.g., NOR Flash is constrained to firmware storage, and PCM is mainly used in niche enterprise storage. RRAM’s ability to balance speed, endurance, power, and density gives it broad commercial applicability across the tech stack.

Memory Type	Read Speed (GB/s)	Write Speed (GB/s)	Power Consumption	Endurance (Write Cycles)	Use Cases
RRAM	1–10	0.1–1	Very Low	1,000,000+	AI accelerators, IoT, storage-class memory
PCM	1–3	0.1–1	Moderate	1–100,000,000	AI, persistent memory, edge inference
NAND Flash	0.4–0.8	0.1–0.6	High	10,000–100,000	SSDs, smartphones, portable storage
MRAM	1–4	1–2	Moderate	Unlimited	Automotive, industrial, embedded systems
NOR Flash	0.01–0.1	0.001–0.01	High	100,000+	Firmware, automotive, industrial controls

RRAM delivers a unique blend of **speed, endurance, power efficiency, and scalability** that makes it highly competitive, especially for **edge AI, embedded systems, and next-generation storage**. Unlike Flash or MRAM, it offers both high-speed and non-volatility with relatively low manufacturing complexity. With NTU’s proprietary RRAM stack, DorsaVi is positioned to lead in markets where **low-latency, high-reliability memory is mission critical**.

How Does RRAM Work ?



SET/LRS

A conductive filament forms between electrodes when a voltage is applied, allowing current to flow.

Reset / HRS

The filament breaks when a reverse voltage is applied, increasing resistance

Resistive Switching Layer (Oxide Material): The core of the ReRAM cell, where resistance changes occur to store data.

Operating on **resistive switching,** meaning it modifies the **resistance of a dielectric material to store binary data** (1's and 0's). This is a fundamental shift from transistor-based memory technologies like DRAM and Flash

RRAM operates by manipulating the electrical resistance of a dielectric (insulating) material, commonly a transition metal oxide such as HfO_2 or TiO_2, sandwiched between two electrodes. Unlike Flash memory, which stores information by trapping electrons, RRAM stores data based on physical changes in material structure, specifically the formation and disruption of conductive filaments.

These filaments form when a sufficient voltage is applied, causing ions (typically oxygen vacancies or metal ions) to migrate and create a low-resistance pathway. The binary states are defined as:

- **'0' (High Resistance State - HRS):** The filament is ruptured or absent, blocking current and representing an OFF state.
- **'1' (Low Resistance State - LRS):** A continuous filament bridges the electrodes, allowing current flow and representing an ON state.

This resistive switching is reversible:

- A **Set voltage** (positive polarity) initiates filament formation, writing a '1'.
- A **Reset voltage** (reverse polarity or lower threshold) breaks the filament, returning to '0'.

Key performance benefits include:

- **Non-volatility**: Data is retained without power, ideal for always-on edge systems.
- **High-Speed Operation**: Switching occurs in nanoseconds, supporting real-time decision-making.
- **Multi-Level Storage**: By controlling filament thickness and stability, RRAM can store more than one bit per cell (MLC).

Core Switching Mechanisms:

NTU's RRAM designs utilise two main switching paradigms:

1. **Valence Change Mechanism (VCM):** Utilises oxygen ion migration to modulate resistance within metal oxide layers. This approach is highly compatible with NTU's oxide gradient engineering and offers enhanced temperature stability.
2. **Conductive Bridge RAM (CBRAM):** Involves metal cation migration (e.g., Ag^+ or Cu^+) forming conductive bridges. While faster, it's less thermally robust than VCM and typically suited for niche embedded applications.

Types of RRAM and Comparative Features

To further evaluate the market potential and technical versatility of RRAM technologies, the following analysis breaks down key variants based on switching mechanisms, materials used, operating metrics, and commercial implications.

Type	Switching Mechanism	Materials Used	Switching Speed	Switching Voltage	Endurance (Cycles)	Retention	Power Consumption	CMOS Compatibility	Key Applications	Strengths
OxRAM	Oxygen vacancy filament formation/rupture	TiO_2, HfO_x, TaO_x	<10 ns	~1–2 V	Up to 10^9	>10 years @ 85°C	Low (<0.2 mW per bit)	High	Embedded memory, neuromorphic computing	High endurance, fast switching, CMOS-friendly, scalable to <5 nm
CBRAM	Electrochemical metal ion migration (Ag^+, Cu^+)	Ag/Cu, GeS_2, SiO_2	<10 ns	~0.2–1.5 V	10^4–10^6	Moderate	Ultra-low (<0.1 μW per bit)	Moderate	IoT, low-power edge devices	Ultra-low power, fast switching
Perovskite RRAM	Mixed ionic-electronic conduction	$Pr_{1-x}Ca_xMnO_3$ (PCMO), other perovskites	<10 ns	~1–3 V	10^3–10^5	Limited	Low–Moderate	Low–Moderate	Neuromorphic, analog computing	Analog switching ideal for AI, high tunability
Chalcogenide RRAM	Filamentary and phase-change behavior	$Ge_2Sb_2Te_5$ (GST)	~100 ns	>3 V	10^5–10^7	Good	Moderate	Low	Mid-endurance applications, data logging	Moderate endurance, good retention
Silicon Oxide RRAM	Silicon-based filament formation/rupture	SiO_2	~10–50 ns	~1–3 V	>10^8 (lab scale)	>10 years (under research)	Low	High	Embedded memory, wearables, edge AI	Highly scalable, CMOS-friendly, low-cost fabrication

Why OxRAM Stands Out Among Alternatives

Among all RRAM variants, **OxRAM (Oxide-based RRAM)** offers the most commercially viable mix of technical performance and manufacturability. Its **high switching speed (<10 ns)**, **excellent endurance (up to 10^9 cycles)**, and **10+ years of thermal retention** at elevated temperatures make it ideal for AI, IoT, and embedded computing platforms. Unlike CBRAM or Perovskite RRAM, OxRAM is both **CMOS-compatible** and scalable to <5nm nodes, allowing it to integrate seamlessly into logic circuits and system-on-chip designs.

While MRAM boasts unlimited endurance, it comes at the cost of complexity and low density. PCM, although high in endurance, is power-hungry and less suitable for low-power use cases. Chalcogenide and Silicon Oxide RRAM types are either slower, harder to manufacture at scale, or still in research phases.

OxRAM's superior balance of performance, power efficiency, scalability, and ecosystem readiness is precisely why NTU and by extension, DorsaVi have prioritised this material class for IP licensing, ASIC integration, and next-gen memory monetisation strategies. The global RRAM landscape comprises several material types and switching mechanisms, each with unique benefits and trade-offs.

OxRAM – Oxygen Vacancy Based RRAM: OxRAM, such as the RRAM developed by NTU, relies on the formation and rupture of conductive filaments via oxygen vacancies in metal oxides like TiO_2, HfO_2, and TaO_x. It supports ultra-fast switching (<10 ns), operates at modest voltages (~1–2V), and demonstrates excellent endurance (up to 10^9 cycles). Its data retention exceeds 10 years at 85°C and it is highly compatible with standard CMOS fabrication. This makes OxRAM ideal for neuromorphic computing and embedded memory. Its main limitation lies in potential variability at smaller nodes, which NTU addresses through oxygen gradient engineering.

CBRAM – Conductive Bridge RAM

CBRAM uses electrochemical migration of metal ions (Ag^+, Cu^+) to form conductive bridges. It also offers sub-10 ns switching and ultra-low power use (<0.1 μW/bit), making it attractive for IoT and edge devices. However, CBRAM has lower endurance (10^4–10^6 cycles) than OxRAM and is more prone to instability under high-temperature conditions.

Perovskite RRAM

This type uses mixed ionic-electronic conduction within perovskite materials (e.g., PCMO). It is promising for analog switching and neuromorphic applications but suffers from poor retention, low CMOS compatibility, and environmental instability, making it less viable for commercial integration at scale.

Chalcogenide RRAM

Based on phase-change behavior (like GST), Chalcogenide RRAM is slower (~100 ns) and requires high voltages (>3V). It offers good retention and moderate endurance but lacks CMOS compatibility, making it suitable mainly for logging or mid-performance memory needs.

Silicon Oxide RRAM

This RRAM type forms filaments in silicon oxide (SiO_2), showing high theoretical endurance (>10^8 cycles) and solid retention. While it is highly CMOS-compatible and suitable for wearables and edge AI, it remains largely in the research phase due to switching uniformity challenges.

Engineering Advancements at NTU:

NTU enhances RRAM performance through:

- **Oxygen Gradient Control**: Tuning oxygen vacancy concentration for reliable switching behavior and minimised variability.
- **Barrier Layer Insertion**: Prevents ion diffusion beyond target zones, reducing read disturb errors.
- **Plasma Surface Treatments**: Stabilises surface conditions and boosts device endurance.
- **Ion Obstruction Architectures**: Improves filament confinement, essential for MLC and low-power operation.

These enhancements directly benefit real-world applications where thermal reliability, endurance, and precision switching are non-negotiable, such as in automotive-grade microcontrollers, remote wearables, and neuromorphic AI.

This foundation enables DorsaVi to not only develop high-performance memory IP but also integrate it into diverse verticals such as wearables, telehealth, defence, and industrial IoT. The company's exclusive access to this RRAM technology underpins its ability to secure strategic partnerships, enter OEM licensing deals, and co-develop custom ASICs for edge AI solutions.
For investors, this IP base enhances the company's valuation outlook by positioning it as an upstream IP licensor and embedded AI hardware innovator. With strong relevance to multiple $10B+ markets and scalable licensing potential, DorsaVi's RRAM portfolio represents a rare, high-potential asset class in the public tech equity landscape.

DorsaVi's RRAM Key Technical Indicators and Performance Metrics

NTU's oxide-based RRAM technology, now licensed to DorsaVi, has undergone extensive reliability, endurance, and device uniformity testing. The results validate its commercial viability and scalability for embedded memory, AI, and IoT applications.

Device Structure and Forming Voltage

NTU's RRAM adopts a **1-Transistor-1-Resistor (1T1R)** configuration, an industry-standard architecture for ensuring precise switching, minimal cross-talk, and compatibility with CMOS fabrication. This design supports integration into standard SoCs and microcontroller platforms.

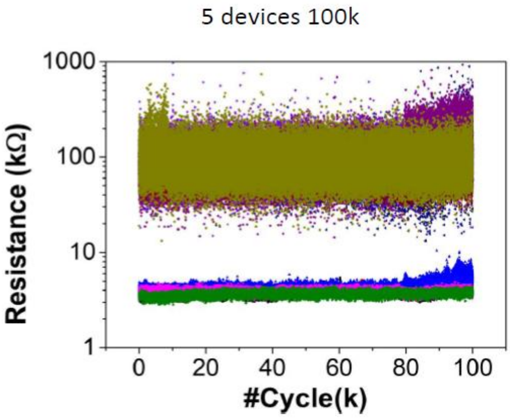
- **Forming Voltage:**
  The devices require a forming voltage of **≤ 2.5V**, enabling low-voltage operation. This aligns well with the requirements of energy-efficient devices and supports logic-level integration with conventional microelectronics.
- **DC I-V Characteristics:**
  The plotted I-V curves of 1T1R cells show clear switching thresholds and repeatability, highlighting consistent performance between high-resistance (HRS) and low-resistance states (LRS) across voltage sweeps.

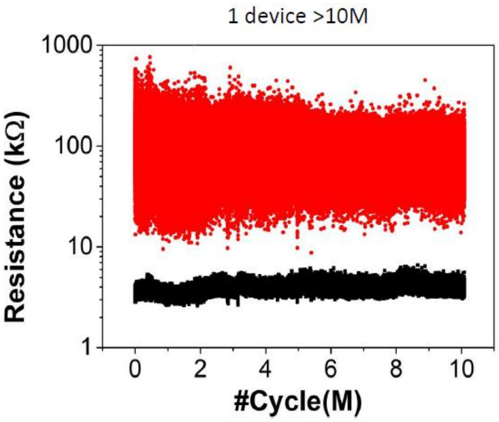
Endurance

NTU's RRAM exhibits strong endurance under read-intensive cycling conditions:

- **Testing Protocol:**
  Endurance was tested using **continuous SET and RESET operations**, with resistance measured after every switching cycle to simulate real-world read stress.
- **Results:**
  - **5 devices** showed stable performance through **100,000 full SET/RESET cycles**.
  - **1 device** successfully demonstrated **>10 million cycles (10^7)**, setting a benchmark for high-endurance memory.

These results confirm RRAM's suitability for high-write frequency applications like industrial monitoring, AI inference engines, and data logging in dynamic environments.

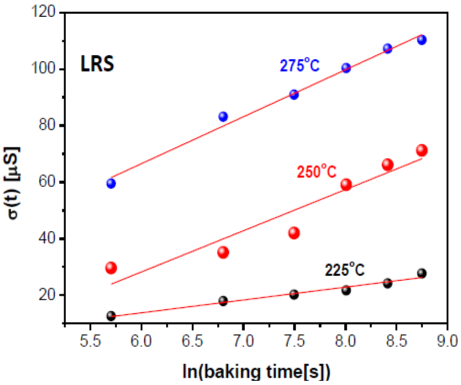


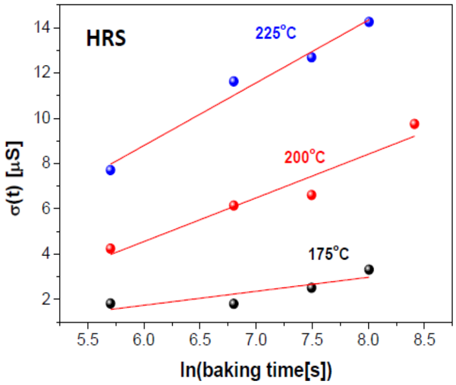


Retention

NTU’s RRAM technology maintains strong data retention characteristics over long periods and extreme temperatures:

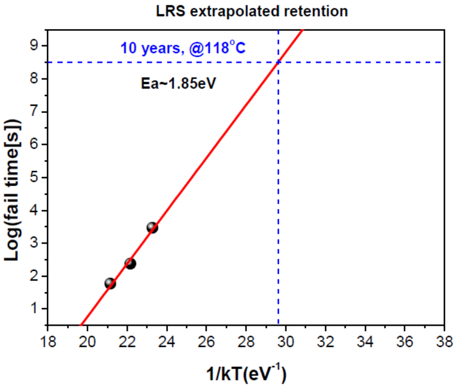
- **Low Resistance State (LRS):** Retention extrapolated to **>10 years at 118°C**, demonstrating durability even in elevated thermal environments.
- **High Resistance State (HRS):** Also validated to **retain for over 10 years at 85°C**, which meets and exceeds most industrial and automotive NVM requirements.

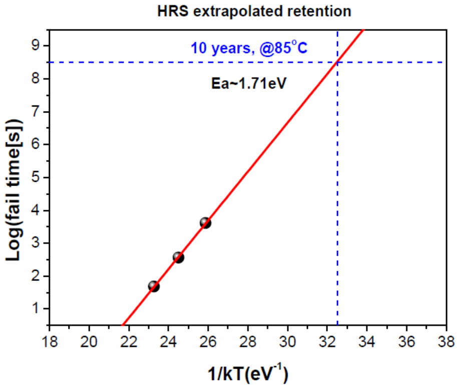




Activation Energy

- LRS: ~**1.85 eV**
- HRS: ~**1.71 eV**. These figures highlight the high thermal activation barriers needed to alter the resistance states, confirming excellent non-volatility and long-term stability.





Variability and Reliability

Consistent behavior across devices is crucial for large-scale integration. NTU’s testing shows excellent repeatability and uniformity:

- **Device-to-Device Consistency:** Evaluated across **>10,000 switching cycles**, confirming minimal deviation in SET and RESET resistance thresholds.
- **Failure Criteria Thresholds:**
  - HRS: $\mu - \sigma > 10\ \mathrm{k\Omega}$
  - LRS: $\mu + \sigma < 5\ \mathrm{k\Omega}$ These statistical limits affirm consistency across fabricated units and support deployment in multi-bit and AI-integrated memory systems.

Performance Metrics Summary (40nm Node)

Metric	DVL’s RRAM Performance Metrics
Process Node (nm)	40
Memory Type	1T1R
Endurance (cycles)	>10 Million
Retention	>10 years@ 85°C
Write Voltage (V)	2-2.5
Write Speed	50-200ns

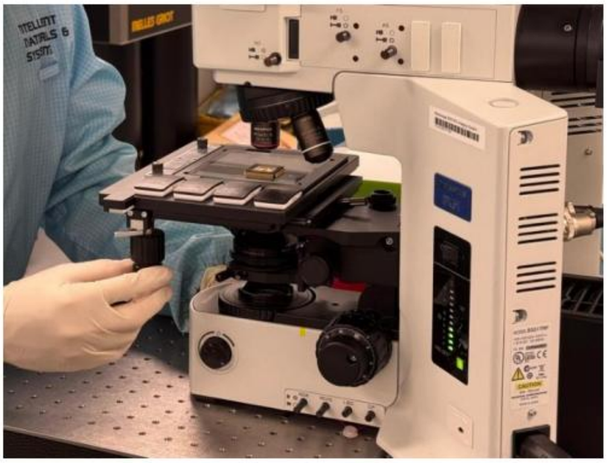
Strategic Use Cases and Immediate Focus

DorsaVi's initial deployment of RRAM technology will focus on applications where rapid response and low energy consumption are essential, such as EMG signal tagging and ECG peak detection. These medical use cases benefit directly from RRAM’s faster performance and reduced power draw, which also lessens wear on traditional NAND storage. This paves the way for more robust real-time diagnostics and continuous patient monitoring.

Looking forward, the platform’s core strengths high reliability, low power operation, and on-device processing make it well-suited for expanding into advanced medical and wearable domains, including:

- Adaptive controllers for prosthetics
- Implantable neurostimulation and cardiac devices
- Gesture-based and haptic feedback wearables
- Multimodal, skin-integrated sensors (such as electronic skin)
- Closed-loop therapeutic monitoring and intervention systems

These areas all require the speed, endurance, and energy efficiency that RRAM-enabled architectures can provide, reinforcing DorsaVi's ability to lead in next-generation health technology.



(Figure 1: Demonstrating dorsaVi’s RRAM during Evaluation)

Enhancing DorsaVi's Wearable Sensors with NTU Singapore’s Advanced RRAM Integration

DorsaVi's exclusive worldwide licence to Nanyang Technological University Singapore’s (NTU Singapore) advanced resistive random-access memory (RRAM) technology represents a pivotal step in transforming the performance and capabilities of its FDA-cleared wearable sensor platforms. This integration empowers DorsaVi to meet the rapidly increasing demand for energy-efficient, intelligent sensor systems in remote injury rehabilitation, elite sports performance tracking, and workplace safety.

Core Technology Highlights

World-First RRAM Innovations:

NTU Singapore’s RRAM portfolio, developed over a decade by Professor Lew Wen Siang and his team, is distinguished by several industry-leading breakthroughs:

- **Tailored Memory Layer Materials**: The main memory layer features precisely engineered defect densities, achieved through advanced materials engineering and multi-layer thin film stacks. This results in exceptionally stable device operation at low voltages, ideal for energy-constrained, battery-powered wearables.
- **Enhanced Thermal Robustness**: A patented plasma treatment and sophisticated ion obstruction barrier fortify device interfaces. This delivers ultra-high endurance and thermal stability, ensuring reliable operation in challenging clinical, sporting, and industrial environments.
- **Patented Architectures**: Nine protected patent families ready for commercialisation, offering tunable properties to support current and emerging applications spanning AI-on-chip, Edge computing, advanced IoT, AR/VR, automotive, robotics, and health-tech.

Key Technical Benefits and Strategic Value for DorsaVi

1. Extended Battery Life and Superior Reliability

- **Multi-layered Architecture**: Advanced RRAM cells are constructed with multiple, controlled layers each performing specialised roles in memory retention, switching, and performance stability. Controlled defect densities and engineered interfaces mean devices use significantly less power, minimise data loss, and exhibit high endurance even in variable temperature and usage scenarios.
- **Impact on DorsaVi Sensors**:
  - Wearable devices last longer between recharges, optimising usability for continuous monitoring in clinical, sporting, or workplace safety contexts.
  - The ultra-stable operation allows sensors to deliver 24/7, real-time motion and physiologic data in settings like remote aged care, occupational safety, or intensive rehabilitation programs.
  - Greater durability reduces device replacement cycles, offering both end users and healthcare providers cost savings and improved operational uptime.

2. **Scalable, Foundry-Compatible Manufacturing**
    - **Production Ready for Scale**: RRAM device architecture is fully compatible with standard, high-volume semiconductor manufacturing. This removes technical and financial barriers to scaling production, enabling rapid entry into global supply agreements.
    - **Commercial Advantages for DorsaVi**:
        - The ability to mass-produce RRAM-enhanced sensors via existing foundry partners accelerates time-to-market and preserves working capital.
        - Supports OEM partnerships and licensing deals across high-growth segments, digital health, consumer wearables, industrial IoT opening recurring revenue streams.
        - Capital-light expansion model: DorsaVi avoids the need to invest in and operate its own fabrication facilities, focusing resources on product innovation and market development.

3. **Accelerated Product Development Using Advanced Circuit Modelling**
    - **SPICE Modelling & Monte Carlo Methods**:
        - Access to industry-proven SPICE simulation models and robust IC design tools allows DorsaVi's engineers to meticulously simulate various memory behaviours virtually, prior to hardware prototyping.
        - Monte Carlo simulations support device-to-device variability analysis, ensuring predictable large-scale sensor array performance.
    - **Business Impact**:
        - Rapid, low-risk design cycles, and reduced R&D spend vital for highly regulated and specialised markets like hospital systems, physiotherapy networks, or occupational health safety monitoring.
        - Strengthens DorsaVi's partner engagement: validated, simulation-based designs enable faster, more flexible co-development and licensing arrangements, including joint ventures for new regional or vertical markets.

4. **AI-Ready, Miniaturised Sensing with Local Edge Processing**
    - **Compact RRAM Cells & Variation-Tolerant Design**:
        - RRAM’s small footprint and process stability underpin extremely compact, high-reliability chips capable of integrating both memory and local AI logic.
        - Advanced “in-memory computing” and analog switching properties allow neuromorphic functions, adaptive learning, and pattern recognition to be performed directly in the sensor.
    - **Market Differentiators**:
        - DorsaVi's next-gen sensors can analyse data in real-time at the source, drastically reducing reliance on cloud connectivity. This enables instant feedback for rehabilitation, athletic assessment, and safety interventions improving reactivity, privacy, and reliability.
        - Local processing enhances data privacy (vital for healthcare and Europe’s GDPR), ensures high uptime in connectivity-limited settings, and supports deployment for mission-critical or remote environments (e.g., mining, logistics, disaster response).
        - By moving to on-device AI, DorsaVi sets the stage for smart features (e.g., fall detection, motion coaching, predictive maintenance) that previously required external hardware or high cloud fees.

Unlocking Next-Generation Sensor Performance with NTU Singapore's Advanced RRAM Technology

DorsaVi's exclusive licence to Nanyang Technological University Singapore's (NTU Singapore) advanced resistive random-access memory (RRAM) marks a pivotal leap in the company's transformation of wearable biosensor technology. Rigorous evaluation confirms that integrating RRAM into DorsaVi's sensor and AI platforms delivers measurable system-level gains in speed, endurance, and energy efficiency directly supporting DorsaVi's strategy for intelligent, low-power, edge processing in real-time biosignal applications.

Four Strategic Advantages Delivered by RRAM Integration

1. **Smarter, Faster Sensors**
   DorsaVi's phased approach will implement RRAM first as part of a hybrid memory (NAND flash + RRAM), then progress to RRAM-only solutions. This efficiently upgrades performance without additional manufacturing costs. Compared with legacy memory, RRAM provides up to 10,000x faster read access and 5–50x faster write speeds. The platform also enables "in-sensor computing" processing and communication on the device itself, laying the groundwork for more responsive, real-time smart sensors in EMG, ECG, and other biomedical applications. These gains translate to longer battery life and robust responsiveness essential for medical, industrial, and sports use cases.

2. **Lower Operating Costs and Stronger Margins**
   With RRAM-driven local data processing, there is a significant reduction in external data transmission, cloud storage, and bandwidth use. This minimises operational expenditure, extends the lifespan of sensors (as RRAM endures 10–100x more program/erase cycles than conventional memory), and reduces device replacement frequency. Cumulatively, these improvements are projected to save DorsaVi up to AUD$150,000 annually in cloud infrastructure costs, enhancing operational efficiency and supporting higher profit margins.

3. **Edge AI, Built Right In**
   RRAM's ability to function as both digital and analog memory means AI processing moves onto the sensor itself. Features like fall detection, motion analysis, and posture correction can operate independently of external processing or cloud access. This level of integration also supports "brain-inspired" computing (neuromorphic architectures), positioning DorsaVi at the forefront of sectors like smart robotics, drones, autonomous systems, and next-generation wearables.

4. **Expansion into New Markets**
   The miniaturised, durable, and energy-efficient nature of RRAM-based hardware enables DorsaVi to target high-growth markets far beyond healthcare, including logistics, agriculture, industrial automation, and consumer electronics. Robust intellectual property protections in regions like the USA, EU, Singapore, and Australia secure these opportunities and ensure DorsaVi retains a strong competitive position as the global demand for intelligent edge sensing accelerates. This expanded versatility opens new pathways for commercial collaborations and future-proofs the company as new applications for smart, secure, energy-efficient devices emerge.

Real-World Impact and Next Steps

Performance benchmarking in clean room trials demonstrates that RRAM-enabled DorsaVi sensors deliver faster and more accurate real-time data handling, longer operational uptime with smaller batteries, increased device lifespan, and greatly improved responsiveness qualities critical for advanced rehabilitation, patient monitoring, and adaptive control in prosthetics and e-skin platforms. The ongoing evaluation will further address long-term device stability, miniaturisation, and hardware-software optimisation, ultimately supporting clinical-grade rollouts across a diversified sensor portfolio.

Building for Market Leadership

By integrating NTU Singapore's world-leading RRAM portfolio, DorsaVi sets a new standard in bio signal sensing ,combining smarter system performance with reduced costs and new commercial opportunities. This foundation supports sustainable shareholder value, market leadership, and positions DorsaVi at the centre of the next wave of innovation in healthcare, workplace safety, and human performance monitoring worldwide.

Strategic Expansion into Robotics and Reflex Intelligence

On 29th July 2025, DorsaVi (ASX: DVL) unveiled an important strategic pivot by extending its advanced memory evaluation program into the robotics sector. Building on its success with integrating resistive random-access memory (RRAM) into wearable medical sensors, the company is now targeting a new class of embedded systems: ultra-low latency robotic reflex platforms.

This effort seeks to deliver sub-millisecond reflex latency through the use of RRAM-based "reflex silicon," designed to support distributed edge computing directly at the sensor node. This innovation is especially critical in dynamic and human-interactive environments such as collaborative robots (co-bots), autonomous mobile robots (AMRs), soft grippers, exosuits, and prosthetics.

Unlike traditional centralised robotic architectures, which suffer from bottlenecks introduced by sensor readout, fieldbus communication, and CPU-bound processing, RRAM-based reflex systems aim to eliminate latency by enabling sensing, memory, and computation within the same local node. This allows robots to detect and respond to contact events in microseconds, significantly enhancing safety, dexterity, and uptime.

Key Technical Highlights of the Reflex Evaluation Program:

- Write latency improvements of up to 50× compared to legacy memory technologies
- Read latency accelerated by more than 5,000×, reaching sub-10 ns access times
- 8–10× reduction in energy consumption per bit
- Over 10 million write/erase cycles validated in edge-use conditions
- Power budgets in the microwatt range with near-zero standby power

RRAM Performance Comparison Table

Metric	Legacy Memory	RRAM-Enabled System
Write Latency	1,000–10,000 ns	200 ns
Read Latency	50,000–100,000 ns	<10 ns
Write Energy (per bit)	1,250 pJ	<200 pJ
Program/Erase Endurance	10^4–10^5 cycles	>10^7 cycles
Retention Stability	10 years @ 85°C	>10 years @ 85°C

These enhancements, validated in prior biomedical trials and now extended to robotic use cases, establish RRAM as a foundational enabler of neuromorphic and reflexive intelligence. By supporting analog matrix-vector multiplication (MVM), RRAM arrays also open the door to on-chip AI, enabling local pattern recognition, slip detection, motion inference, and tactile control, all without reliance on cloud infrastructure.

How RRAM Transforms Key Robotic Subsystems

Robotic Subsystem	RRAM-Enabled Advantage
Tactile Sensing	Skin-level sensors with <50 μs latency for real-time haptic feedback
Motion Control	Neuromorphic control loops reacting in microseconds
Power Systems	μW-level event-driven wakeups extend AMR and wearable robot lifetimes
Soft Grippers	Slip detection and adaptive force control at >1 kHz bandwidth
Prosthetics/Exosuits	Real-time EMG/ECG processing with integrated on-node memory and logic

DorsaVi is currently engaged in robotic-specific benchmarking under actuator load and tactile sensing conditions, with evaluation results expected within four weeks. Hardware demonstrators, prosthetic integration pilots, and academic collaborations are underway to translate these findings into commercial platforms. This initiative directly builds upon the company’s exclusive access to nine global RRAM patents and strengthens its position at the intersection of wearable intelligence and robotic autonomy.

Peer Analysis: DorsaVi Ltd vs. ASX Semiconductor Peers

DorsaVi (ASX: DVL) is transitioning from a motion analytics company into a deep-tech semiconductor innovator through its exclusive partnership with NTU Singapore. By acquiring and licensing advanced oxide-based RRAM IP, DorsaVi is positioning itself at the intersection of memory innovation and edge intelligence. When compared to ASX-listed semiconductor peers, DorsaVi offers strategic differentiation in embedded RRAM IP, health tech integration, and edge AI enablement.

Benchmark Positioning

DorsaVi's commercial roadmap focuses on integrating RRAM into edge compute platforms, especially for wearables, telehealth, industrial IoT, and AI analytics. Its access to NTU's memory IP allows DorsaVi to compete across both RRAM and neuromorphic memory domains, with near-term licensing and product integration potential.

Comparative Overview

Company	Ticker	Market Cap (A$M)	Technology Focus	Commercial Stage	Key Differentiators
DorsaVi	DVL	~29	OxRAM Memory IP + Edge AI	Licensing + Product Integration	Exclusive IP from NTU; AI + health tech integration
Weebit Nano	WBT	~370	RRAM Memory IP	IP licensing, early PoCs	Advanced RRAM, no AI integration
BrainChip	BRN	~465	Neuromorphic Processors	R&D / pilot partnerships	Spiking neural networks, unique AI architecture
4DS Memory	4DS	~68	MRAM Technology	R&D / licensing	MRAM focus, not AI-enabled
Archer Materials	AXE	~65	Quantum & Biosensors	R&D phase	Quantum computing and biosensor materials focus

Strategic Advantages of DorsaVi

- **Integrated Memory IP with Industry Applications**
  DorsaVi is one of the only listed companies integrating next-generation RRAM IP into vertically specific products across health tech, industrial safety, and wearables. Its ViMove+ and Video AI platforms provide a real-world application layer above the memory substrate, unlike most peers focused solely on chip-level R&D.
- **Exclusive Partnership with NTU Singapore**
  Backed by a $120M research effort and fabricated on 12" wafers, DorsaVi's RRAM IP comes from a mature development program with GlobalFoundries. This gives DorsaVi immediate access to a scalable memory architecture that is production-ready and peer-reviewed (ACS Nano, Nanoscale Horizons 2024).

- **Commercialisation Optionality**
  DorsaVi has two monetisation tracks: (1) licensing RRAM IP to semiconductor partners, and (2) embedding the memory into its own sensor platforms for healthcare, biomechanics, and AI analytics. This hybrid model offers greater flexibility than companies solely dependent on OEM or foundry partnerships.
- **Low-Power Architecture Optimised for Edge AI**
  NTU RRAM supports <2.5V operation with <0.2 mW per bit consumption and high endurance (>10M cycles). This makes it ideal for integration into DorsaVi's edge platforms where power constraints and miniaturisation are critical.
- **Valuation Upside and Market Opportunity**
  With a current market cap of ~A$29 million, DorsaVi is undervalued relative to its IP and commercial positioning. As edge AI and embedded memory markets expand, DorsaVi is well-placed to benefit from licensing revenue, AI-chip partnerships, and application-layer AI growth in healthcare and wearables.

Technical Comparison of NTU’s RRAM with Competitors

NTU’s oxide-based RRAM, developed in collaboration with GlobalFoundries and now exclusively licensed by DorsaVi, demonstrates superior performance across endurance, power efficiency, and manufacturability. Unlike many commercial solutions that trade off power for density or require advanced nodes for reliability, NTU’s solution delivers exceptional technical balance on a mature and cost-effective 40nm node.

Comparative Table: RRAM Technology Players

Features	NTU x GF	Weebit Nano (SkyWater S130)	Crossbar RRAM	TSMC RRAM	IMEC / Intel RRAM	4DS (PMCO)	Ramxeed
Process Node	40nm	130nm	<40nm	16nm	14nm (research)	60nm (20nm R&D)	Not Specified
Endurance (Write Cycles)	10M+	100K – 1M	1M – 10M+	1M+	10M+ (lab)	10M+	0.5M – 1M
HRS/LRS Ratio	~26X	Not Disclosed (ECC used)	~10 – 100X	~50X+	~100X+	Not Disclosed	Not Specified
Read Latency	10–20ns	<20ns (system level)	<10ns	~10ns	Sub-10ns	Not Specified	Not Specified
Write Voltage	<2.5V	3.3V – 3.6V	1.8V – 2.5V	~2V	1.5V (R&D)	Not Specified	1.6V – 3.6V
Density	1Mb	256Kb – 2Mb	Mb – Gb	Mb (SoC-level)	GB-scale (experimental)	Mb – Gb	Mb-level
Retention @ 85°C	>10 years	>10 years	>10 years	>10 years	>10 years	Not Specified	Not Specified

Why NTU RRAM Outperforms

1. High Endurance at a Mature Node

NTU's RRAM exceeds **10 million write cycles** on a **40nm process**, a rare feat as most competitors require 130nm+ or sub-20nm nodes to achieve similar or lower endurance levels. This positions DorsaVi to scale without needing expensive node transitions.

2. Energy-Efficient Write Operation

With **<2.5V write voltage**, NTU's RRAM consumes significantly less power than Weebit Nano (3.3–3.6V) or Ramxeed. This makes it ideal for battery-operated edge AI systems, wearable tech, and energy-constrained industrial devices.

3. Strong Signal Integrity (HRS/LRS Ratio)

A **~26× HRS/LRS ratio** offers strong noise margins and less reliance on ECC (Error Correction Code), unlike some commercial designs. This enhances intrinsic data integrity, especially valuable in AI accelerators and neuromorphic devices.

4. Read Latency Optimised for Real-Time Compute

With a **10–20ns read latency**, NTU's solution balances fast access with reliable retention. It performs comparably to or better than leading-edge technologies like Crossbar (<10ns) and TSMC (~10ns) but without requiring 16nm or lower fabrication nodes.

5. Superior Retention and Stability

Retention testing demonstrates stable performance **beyond 10 years at 85°C**, supporting long-term storage in high-temperature environments such as automotive and industrial electronics.

6. Cost-Optimised Manufacturing

Manufacturing at **40nm** allows cost-effective scaling without needing access to expensive cutting-edge nodes (like 14nm or 16nm). This gives DorsaVi a **relative cost advantage** for mass deployment across edge, IoT, and embedded markets.

Competitive Advantage Summary

Positioning	Value Proposition
Differentiation Focus	Research-grade endurance and retention at a mainstream node, ideal for edge AI & IoT
Unique Specs at Mature Node	Only 40nm platform offering >10M cycles, 10–20ns latency, and ~26× HRS/LRS
Cost Leadership	Low voltage, moderate density (1Mb), and mature-node process reduce integration cost
Long-Term Reliability	>10-year retention @ 85°C positions it for industrial, medical, and automotive uses

Strategic Positioning and Commercialisation Roadmap

Monetisation Model

DorsaVi's transition into the deep-tech semiconductor sector is underpinned by a multi-pronged monetisation strategy. This approach leverages the scalability of IP licensing, the differentiated value of vertical product integration, and the long-term value creation from collaborative ecosystems:

1. **IP Licensing to Semiconductor OEMs**
   DorsaVi will monetise its exclusive rights to NTU’s RRAM through high-margin licensing agreements with global semiconductor OEMs. This capital-efficient model eliminates the need for in-house chip fabrication, allowing DorsaVi to earn recurring royalties or one-time licensing fees by enabling third-party foundries to embed NTU RRAM IP into their logic, AI, and embedded memory solutions.

2. **Direct Integration into DorsaVi's Proprietary Devices**
   DorsaVi plans to integrate RRAM directly into its existing suite of commercialised sensor technologies including ViMove+, ViSafe+, and AI-based video analytics platforms. Embedding RRAM will enhance on-device intelligence, eliminate external memory bottlenecks, and improve power efficiency across wearables, industrial diagnostics, and real-time health monitoring. This also offers differentiated market value in the digital health, workplace safety, and elite sports sectors.

3. **Joint Ventures & Strategic Partnerships**
   DorsaVi is actively exploring co-development initiatives and strategic alliances with partners across defence, industrial automation, and medical technologies. These joint ventures will co-finance ASIC and SoC development, drive RRAM adoption in secure-edge environments, and fast-track industry-specific certifications, thereby increasing IP stickiness and unlocking long-term recurring revenue.

Execution Timeline

DorsaVi's roadmap reflects a phased approach to commercialisation, balancing early revenue generation with deep IP value capture and scalable deployment:

Year 1–2: Validation & Early Commercialisation

- Development and launch of RRAM-enabled prototypes in collaboration with NTU and GlobalFoundries
- Technical benchmarking and publication in academic/industry journals
- Initiation of OEM licensing discussions targeting AI chipmakers and IoT device manufacturers
- Integration of RRAM modules into select ViMove and ViSafe platforms for live pilot testing

Year 2–3: Foreground IP Conversion & ASIC Integration

- Co-development of Foreground IP (FG IP) with NTU to refine AI + memory integration pathways
- Conversion of FG IP into exclusive licensing fields across specific verticals (e.g., edge AI, digital health)
- Fabrication of RRAM-based ASIC or SoC prototypes for embedded use cases
- Entry into funded joint ventures with sector-focused OEMs and government tech programs

Year 3–5: Scaling Monetisation & Global Expansion

- Expansion of licensing deals across semiconductor ecosystems, particularly in Asia and North America
- Strategic scaling through contract manufacturers and ecosystem partners for wearable and industrial-grade devices
- Diversification into smart city, automotive diagnostics, and secure edge compute verticals
- Potential spin-out or listing of the IP business unit depending on capital markets and strategic alignment

This commercialisation roadmap combines DorsaVi's agility in product deployment with the economic leverage of high-value semiconductor IP. By targeting capital-light monetisation pathways, the company is positioned to create defensible revenue streams and enter billion-dollar markets in health tech, edge AI, and embedded intelligence.

Commercial Applications and Market Opportunity

DorsaVi's exclusive access to NTU's oxide-based RRAM technology positions the company to address a broad spectrum of high-growth verticals that demand ultra-low-power, high-endurance, and compact memory solutions. Each of these sectors is undergoing rapid transformation, driven by AI, edge computing, and next-gen embedded electronics. DorsaVi's capital-light business model and vertically integrated hardware-software platforms offer strategic leverage to enter these markets through licensing, co-development, and direct integration.

Sector	Application Examples	Market Size by 2030
Wearable Tech	Wearables for home diagnostics, movement tracking, posture correction, fitness sensors, smartbands	$233B+
IoT Devices	Smart lighting, home automation, environmental sensors, industrial IoT, anomaly detection systems	$181B+
Spatial Computing	Real-time 2D-to-3D conversion, AR/VR headsets, immersive video, smart glasses and metaverse interfaces	$286B+
Edge AI	On-device NLP, object detection, AI-enhanced cameras, translation engines, edge compute accelerators	$151B+
Sports Tech	Motion analytics, biomechanical feedback tools, real-time athlete performance monitoring, wearable telemetry	$68B+
Defence Tech	Secure embedded memory, battlefield wearables, soldier health telemetry, encrypted logging nodes	$238B+

Wearable Health Tech

The global wearable medical devices market was valued at **USD 91.21 billion in 2024** and is projected to reach **USD 324.73 billion by 2032**, growing at a CAGR of **17.8%**. In 2024, North America alone accounted for **46.09%** of the global share. According to mHealth Intelligence, approximately **35% of U.S. adults use wearable healthcare devices**, highlighting widespread adoption.

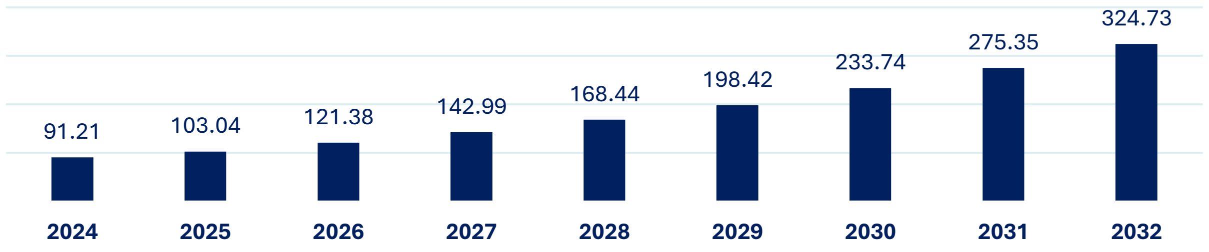
DorsaVi's RRAM-enabled platforms offer a high-value solution to this market. Integrated into compact biometric monitoring wearables such as smart rings, in-ear medical sensors, or patch-based diagnostics. DorsaVi's embedded memory supports continuous on-device analytics for metrics including ECG, heart rate variability, SpO_2, and sleep patterns.

Key advantages of using DorsaVi's RRAM IP in wearables:

- **Ultra-low power draw** enabling multi-day operation on a single charge
- **<2.5V operating voltage** ideal for small batteries
- **On-device processing** without constant cloud connectivity, improving data security and battery life
- **Fast local memory access** with long retention and minimal latency

These features are tailored for the next generation of medical-grade wearables that must function in real time, with limited power and no reliance on continuous wireless transmission.

The Global Wearable Medical Devices Market Size (USD Bn)



Source: Fortune Business Insights

IoT Devices

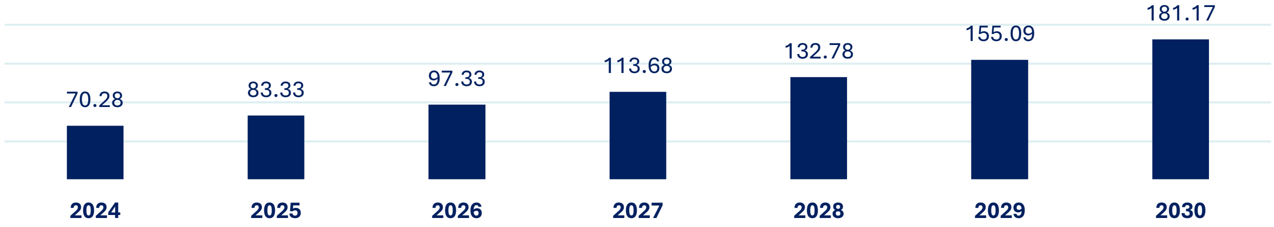
The global Internet of Things (IoT) devices market was valued at USD 70.28 billion in 2024 and is projected to grow to USD 181.17 billion by 2030, reflecting a compound annual growth rate (CAGR) of 16.8% from 2025 to 2030. The market is expected to reach USD 83.33 billion in 2025 as the adoption of IoT accelerates across industries.

This robust expansion is driven by technological convergence, particularly the rise of 5G connectivity, edge computing, and the growing need for real-time data analytics. These innovations are transforming operational efficiency across sectors like healthcare, manufacturing, and smart infrastructure, while enabling the creation of intelligent, connected products and services.

North America led the global IoT devices market in 2024, capturing over 34% market share, bolstered by widespread adoption of smart consumer electronics, increasing deployment of IoT-enabled systems, and a mature telecom infrastructure. The ongoing rollout of 5G across the region is expected to further accelerate device connectivity and data transmission, reinforcing North America's dominant position in the global IoT landscape.

DorsaVi's RRAM-enabled solutions are uniquely suited for the demands of IoT devices operating in real-time, edge-based environments. Embedded in compact, battery-powered devices, ranging from industrial sensors to smart home modules

The Global Internet of Things (IoT) Devices Market Size (USD Bn)



Source: Grand View Research

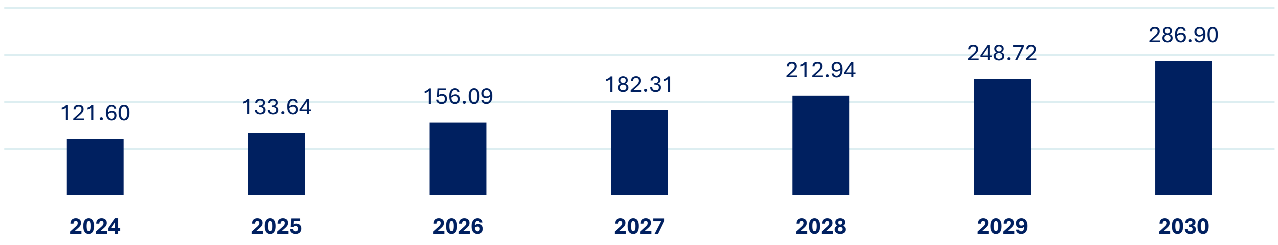
AR/VR and Spatial Computing

Spatial computing requires ultra-low latency, high-bandwidth data processing and precise real-time responsiveness especially in use cases like smart eyewear and augmented/virtual reality (AR/VR). DorsaVi's RRAM-enabled memory architecture offers key advantages in this domain:

- **Real-time 2D-to-3D data transformation** on device, enabling continuous depth mapping and environmental awareness
- **Ultra-low power operation**, reducing thermal output and enabling lightweight, extended-use wearables such as AR glasses
- **Compact integration into ASICs**, allowing spatial compute functionality in slim, user-facing devices
- **Instant memory access with >10-year retention**, supporting smooth transitions between active and passive compute modes

By enabling persistent, secure, and efficient data processing within spatial computing interfaces, DorsaVi's RRAM IP becomes essential to powering the next generation of immersive, intelligent digital interactions.

The Global Spatial Computing Market Size (USD Bn)

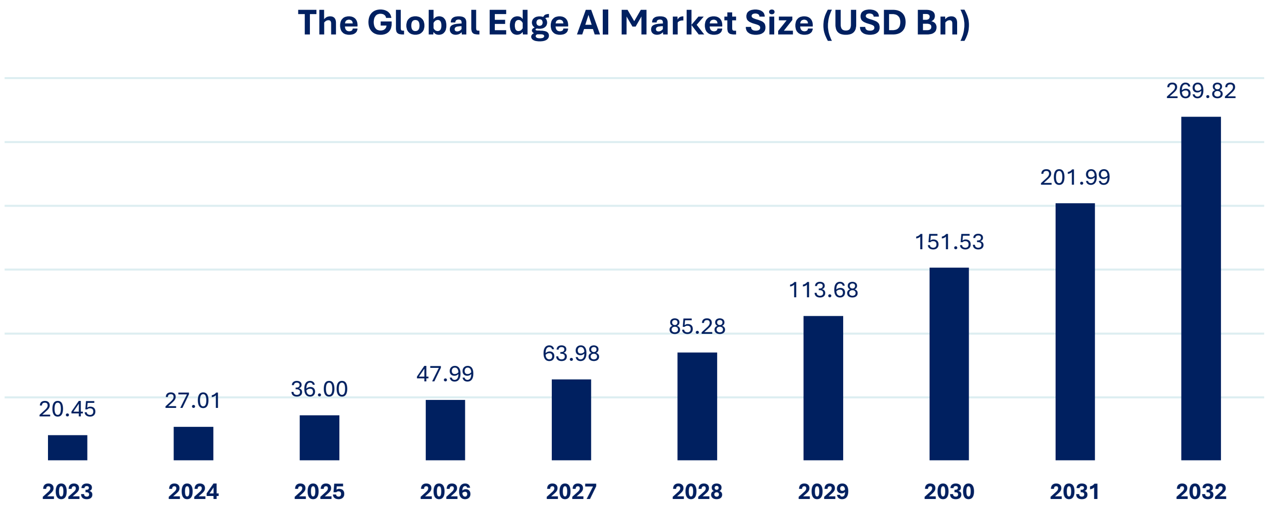


Source: Prophecy Market Insights

Edge AI

The global edge AI market was valued at **USD 20.45 billion in 2023** and is projected to reach **USD 269.82 billion by 2032**, representing a CAGR of **33.3%**. In 2024 alone, the market is expected to reach approximately **USD 27.01 billion**, driven by the proliferation of edge devices in consumer, industrial, and healthcare sectors each demanding low-latency, real-time intelligence without reliance on cloud infrastructure.

DorsaVi's RRAM technology directly addresses the memory and power bottlenecks of edge AI workloads. By enabling low-voltage, high-speed memory access on compact chips, DorsaVi empowers smart rings, posture-correcting wearables, and mobile diagnostic tools to run embedded AI features like motion classification, voice recognition, and biometric analysis in real time without compromising battery life or responsiveness



Source: Fortune Business Insights

Sports Tech

The global sports technology market is projected to grow from **USD 34.25 billion in 2025** to **USD 68.70 billion by 2030**, advancing at a **14.9% CAGR**. This rapid expansion is fueled by the integration of wearable technologies, AI-powered analytics, and immersive applications like augmented and virtual reality (AR/VR) that enhance both performance and fan engagement.

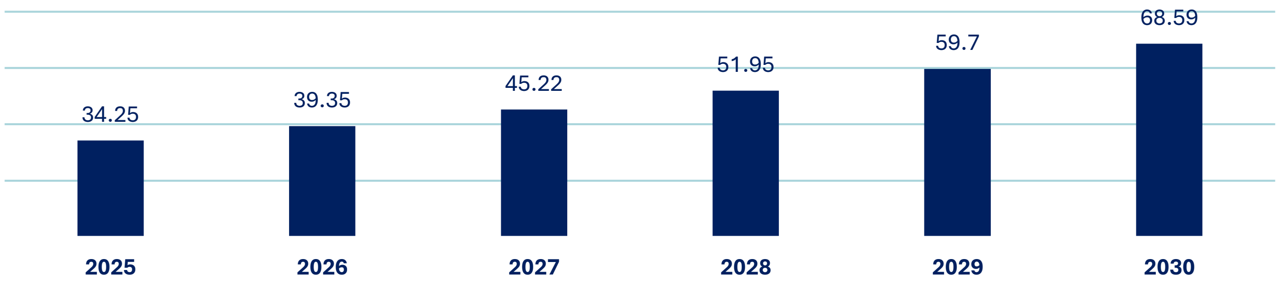
The demand for personalised training feedback, injury prevention, and enhanced athlete-coach interaction is transforming sports science. At the same time, partnerships among leagues, broadcasters, and sports tech firms continue to drive innovation across consumer and elite-level athletic performance platforms.

DorsaVi is well-positioned to capitalise on this opportunity through its RRAM-integrated wearable platforms that deliver:

- **On-body diagnostics** with embedded analytics for fatigue detection, gait analysis, and postural correction
- **Real-time biomechanical feedback** for athletic training and rehabilitation, eliminating the need for cloud-connected processing
- **Extended battery life and low-latency processing**, enabling wearables that operate continuously across full training sessions
- **Resilient memory performance** in dynamic environments, ideal for elite sports, military training, and occupational risk assessment

DorsaVi's ability to integrate fast, non-volatile memory into field-tested wearable platforms offers a unique solution to the evolving needs of the global sports tech ecosystem.

Sports Tech Market Size (USD Billion)



Source: Markets and Markets

Defence Tech

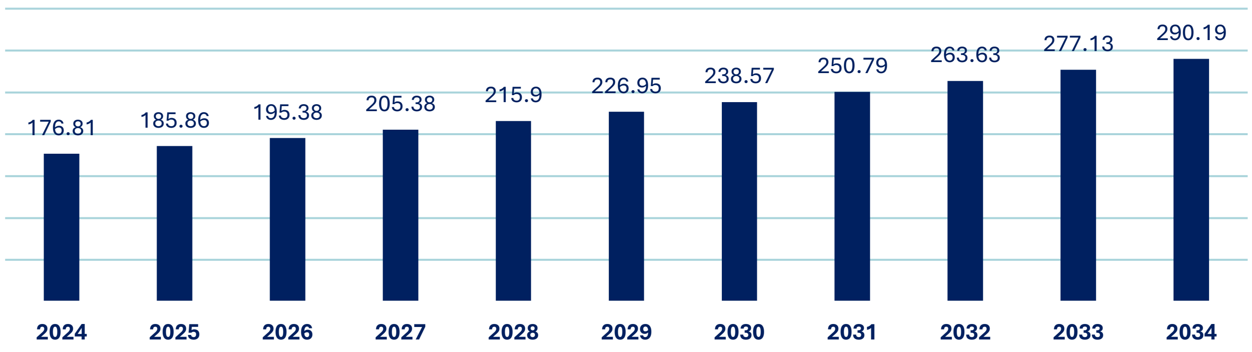
The global defence electronics market size stood at **USD 176.81 billion in 2024** and is expected to increase from **USD 185.86 billion in 2025** to approximately **USD 290.19 billion by 2034**, growing at a CAGR of **5.08%**. The defence sector is undergoing a major digital transformation driven by the integration of artificial intelligence (AI), edge computing, and connected military-grade IoT devices.

DorsaVi's RRAM-enabled platforms are strategically aligned with high-priority defence applications such as:

- **Secure embedded memory** for mission-critical systems that require encrypted data storage with high resilience against tampering and physical stress
- **Battlefield wearables** that deliver low-power, real-time diagnostics and tactical insights to soldiers in active environments
- **Soldier health telemetry systems**, capable of locally processing biometrics such as heart rate, hydration, fatigue, and stress without cloud dependence
- **Encrypted logging nodes** designed for portable or unmanned systems requiring persistent, secure audit trails under extreme conditions

With increasing investment across airborne, land, and space-based platforms, DorsaVi's compact, high-endurance RRAM IP can help fulfill next-generation military requirements where reliability, energy efficiency, and data sovereignty are essential.

Defence Tech Market Size (USD Billion)



Source: Precedence Researcher

Conclusion: Why DorsaVi Ltd (ASX: DVL) Is a Strong Opportunity for Investors

DorsaVi Ltd represents a rare combination of healthcare innovation, neuromorphic robotics, and deep-tech semiconductor advancement. Through its exclusive partnership with Nanyang Technological University (NTU), DorsaVi has acquired access to a world-class RRAM IP portfolio, positioning the company as a first mover in ultra-low power, high-endurance, non-volatile memory for edge systems. Fabricated in collaboration with GlobalFoundries, this breakthrough delivers high endurance (10M+ write cycles), low voltage (<2.5V), sub-20ns latency, and >10-year retention at 85°C, making it ideal for robotics, edge AI, IoT, wearable health, and defence applications

For investors, DorsaVi represents a rare combination of:

- **Exclusive IP Access**: Only listed ASX company with secured rights to NTU’s oxide-based RRAM platform, developed over six years with $120 million in R&D and validated at the 12” wafer level.
- **Capital-Light Monetisation**: With no need to build or operate a fabrication facility, DorsaVi can pursue high-margin, low-overhead revenue through global IP licensing, ASIC partnerships, and OEM co-development.
- **Exposure to High-Growth Markets**: RRAM integration unlocks DorsaVi's access to total addressable markets exceeding $1 trillion, spanning wearables ($233B), spatial computing ($286B), edge AI ($151B), and defence electronics ($290B).
- **Full-Stack Commercialisation Path**: Beyond licensing, DorsaVi is able to embed its RRAM technology into proprietary platforms such as ViMove+, ViSafe+, and Video AI enabling vertical integration from memory to software-driven diagnostics.
- **Compelling Valuation Arbitrage**: Trading below ~AUD 29 million in market capitalisation, DorsaVi offers asymmetric upside potential compared to semiconductor and memory peers such as Weebit Nano ($370 milliion), BrainChip ($465 milliion), and 4DS Memory (~$68 million), many of which do not have productised platforms or exclusive access to academically and commercially validated IP.
- **Multiple Near-Term Catalysts**: Upcoming RRAM prototype demonstrations, potential OEM licensing announcements, and expansion into embedded AI health and defence verticals are expected to drive visibility and re-rating potential.
- **Reflex Robotics Differentiation:** RRAM-enabled neuromorphic architecture allows ultra-low latency, on-node computation that powers reflexive control loops, critical for advanced robotic systems such as collaborative arms, prosthetics, and autonomous mobile platforms.

In a macro environment demanding decentralised intelligence, real-time actuation, and low-power compute at the edge, DorsaVi's technology is no longer limited to health, it’s built for the future of robotics. The company is now aligning its commercial focus entirely around robotics as a core business. Its patented RRAM platform, embedded AI capability, and validated edge reflex performance create a compelling foundation for investors seeking early exposure to one of the most impactful hardware shifts in the intelligent systems space.

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