Micron Unveils World's First 1.5TB microSD Card and Automotive Functional Safety-Certified Memory to Fuel Data at Intelligent Edge

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Embedded solutions and partnerships bring Micron's 176-layer NAND and 1α DRAM innovations to industrial and automotive markets

NUREMBERG, Germany, June 21, 2022 (GLOBE NEWSWIRE) -- Embedded World – Micron Technology, Inc. (Nasdaq: MU), today announced expansions to its embedded product portfolio and ecosystem partnerships to deliver powerful solutions optimized for complex memory and storage demands at the intelligent edge. The company is sampling to customers the world's highest-capacity microSD card, the i400, at an unprecedented density of 1.5 terabytes (TB). This card is designed for industrial-grade video security with the world's first 176-layer 3D NAND , also pioneered by Micron. To better provide its high-performance, ruggedized solutions to the industrial market, Micron is also adding partners to its Industrial Quotient (IQ) partner program. Additionally, the company is announcing it has received the first International Organization of Standardization (ISO) 26262 Automotive Safety Integrity Level (ASIL) D certification of memory for its low-power double data rate 5 (LPDDR5) DRAM, which is based on its first-to-market 1α (1-alpha) process node. With next-generation advanced driver-assistance systems (ADAS) applications requiring increasing levels of autonomy and safety, this certification validates that Micron's LPDDR5 meets strict functional safety standards and positions it to enable innovations that will unleash full autonomy in intelligent vehicles.

As 5G, artificial intelligence (AI) and the internet of things (IoT) converge at the edge, the world is experiencing an explosion of devices across autonomous vehicles, video security, smart factories, energy infrastructure, robotics, industrial transport, health care and more. ABI Research estimates 25 billion connected IoT devices by 2026,[1] each generating enormous amounts of mission-critical data. This data increasingly needs to be stored, managed and analyzed at the edge — where it is created — for actionable real-time insights. Facilitating these tasks requires industrial-grade memory and storage capable of processing massive data sets in harsh conditions, from high temperatures to shock and vibrations.

"With edge devices generating critical insights for everything from public safety to vehicle autonomy to manufacturing operations, today's smart applications cannot afford to compromise on latency or quality," said Kris Baxter, corporate vice president and general manager of Micron's Embedded Business Unit. "Micron's newest high-performance, ruggedized solutions — our i400 microSD card for video security and automotive ASIL-D-qualified LPDDR5 — will unlock new value for businesses and drive the rapid innovation needed at the intelligent edge."

These solutions generate more value for enterprises at the intelligent edge with proprietary features purpose-built for industrial applications. Unlike consumer-grade memory and storage that can malfunction in industrial environments and result in critical data loss or disrupted operations, Micron's i400 and automotive LPDDR5 are uniquely tailored to offer the longevity and reliability needed to speed innovation and extract greater business value at the edge.

World's first 1.5TB microSD delivers industrial storage for AI-enhanced video security
With rising demand for real-time video security, the internet protocol video security and video security-as-a-service (VSaaS) market is estimated to be worth $83 billion by 2030.[2] Fleet dash cameras, smart home security, police body cameras and AI-enabled cameras in factories all need storage capable of handling media-rich data. As the world's highest-capacity microSD card, Micron's i400 is ideally suited for video storage at the edge and hybrid VSaaS deployments.

The substantial 1.5TB density can store up to four months or 120 days of video security media locally, enabling users to optimize what data is stored in the cloud. The high capacity eliminates the need to continuously upload data to the cloud for primary storage, a process that guzzles network bandwidth and operational expenses.[3] Small businesses looking to reduce expensive bandwidth or remote sites — such as cargo ships or oil rigs with limited connectivity — can instead periodically upload data to the cloud for backup while relying day to day on i400 storage at the edge. Bringing primary storage to the edge enables real-time AI analytics and faster decision-making within smart cameras. This speed is especially crucial for critical law enforcement, public health or safety decisions.

Unlike most cards on the market that are consumer-grade and have limited write capability, the i400 is designed for the video security environment with features such as:

- Five years of high-quality continuous 24x7 recording
- Ability to concurrently handle 4K video recording and up to eight AI events per second, such as object detection and classification like license plate or facial recognition
- Two million hours for mean time to failure

Micron is sampling the i400 to customers, including Verkada, a cloud-managed enterprise building-security provider. Verkada protects over 12,000 organizations, including 43 of the Fortune 500, with its intelligent cameras and recently donated cameras to Asian American-owned businesses seeking enhanced safety to address the spike in anti-Asian hate crimes, which have risen by 339% in the U.S. last year.

"Micron's industrial-grade storage is key to helping us protect our customers and communities, from schools to large enterprises, by meeting the most demanding of video retention and security requirements," said Raj Misra, vice president of hardware engineering at Verkada. "The latest i400 solution will provide further peace of mind by enabling greater video storage at the edge and faster in-camera AI analytics — important in crises where response time is paramount."

Micron achieves world's first LPDDR5 ISO 26262 ASIL-D certification
ADAS-enabled vehicles now run over 100 million lines of code and require hundreds of tera operations per second, rivaling data center compute. Gartner® projects the worldwide factory-fitted automotive memory market will grow to nearly $15 billion in 2026, quadrupling from $3.3 billion last

year.[4] At the same time, automakers must comply with strict functional safety standards for electronic systems. Trusted, high-performance memory is imperative for reliably powering safety-critical applications such as adaptive cruise control, lane departure warning and blind-spot detection. It is also key to unlocking ADAS technologies such as autonomous valet parking and ridesharing, 4D digital imaging radar, and hands-free experiences that will pave the way for full Level 5 autonomy.

Filling these needs, Micron's automotive LPDDR5 memory is now certified by exida, a renowned expert in automotive safety, for the most stringent safety integrity level, ASIL D, under ISO 26262. LPDDR5's high performance, power efficiency and low latency also provide the headroom to keep pace with rising bandwidth requirements of next-generation automotive systems. Now in mass production in 48- and 96-gigabit densities, Micron's LPDDR5 offers:

- **Proprietary on-chip safety features**, including capabilities to detect and alert the system of systematic and random hardware faults so the vehicle can intelligently react and respond
- **Up to 50% increase in data access speeds**, enabling near-instantaneous decision-making from intelligent vehicles' multiple sensors and inputs, such as radar, lidar, hi-resolution imaging, 5G networking and optical image recognition[5]
- **Over 30% improvement in power efficiency**, minimizing power consumption for electric and conventional vehicles and resulting in greener, longer-range transportation with lower emissions[6]

While the ISO 26262 standard does not explicitly require memory to be ASIL-compliant today, Micron has gone the extra mile to achieve this industry-first certification and architect its proprietary on-chip safety features, recognizing how critical memory is to safety applications. These one-of-a-kind capabilities significantly reduce the burden for automakers by minimizing their need to build in additional mechanisms to mitigate risk, thereby simplifying system design and accelerating time to market. Beyond the product certification of LPDDR5 for ASIL D, exida has also certified Micron's process capability to develop any synchronous DRAM product according to ISO 26262 requirements. This capability equips the company to release additional solutions in its portfolio of automotive solutions based on ISO 26262 soon.

These certifications follow Micron's 2021 milestone of sampling the industry's first LPDDR5 hardware-evaluated to meet ASIL-D suitability requirements and of establishing an office of functional safety. The office is dedicated to collaborating with customers on the memory requirements of designing safe automotive systems through Micron labs in Munich, Detroit, Shanghai, Tokyo and beyond.

Micron's Industrial Quotient partner program gains traction with new additions
Complementing these developments, Micron is adding embedded and edge computing module providers congatec and PHYTEC to its IQ partner program. The IQ program fosters close collaboration with ecosystem partners to produce solutions that are tightly aligned to the industrial market's demanding requirements for quality, longevity, ruggedization and reliability. These characteristics are vital for industrial implementations, such as factories, that need equipment to run smoothly for decades.

Congatec and PHYTEC design and manufacture computer-on-modules and system-on-modules, respectively, used in medical technology, industrial automation, renewable energy, aerospace, transportation and other industries. The addition of these two companies, both based in Germany, make Micron's trusted memory and storage solutions more broadly accessible to the industrial market and better serve the burgeoning European Industry 4.0 market.

These product portfolio and partner updates strengthen Micron's leadership in intelligent edge markets, with the company uniquely positioned in both the automotive[7] and industrial[8] segments as the memory market share leader.

Resources

- Solutions overview: Micron Industrial microSD Cards: The Card That Never Sleeps
- Blog: Micron Delivers ASIL-D ISO 26262-Certified LPDDR5 for Safety Requirements
- Product page: Functional Safety for Automotive
- Podcast: Chips Out Loud: Industry-First ASIL-D ISO 26262-Certified LPDDR5 to Address Advanced Automotive Applications With Strict Safety Requirements
- Blog: Why Building Solutions With Industrial-Grade Products Really Matters
- Program page: Industrial Quotient Partners
- Video: Micron's Industrial Quotient

About Micron Technology, Inc.
We are an industry leader in innovative memory and storage solutions transforming how the world uses information to enrich life *for all*. With a relentless focus on our customers, technology leadership, and manufacturing and operational excellence, Micron delivers a rich portfolio of high-performance DRAM, NAND and NOR memory and storage products through our Micron® and Crucial® brands. Every day, the innovations that our people create fuel the data economy, enabling advances in artificial intelligence and 5G applications that unleash opportunities — from the data center to the intelligent edge and across the client and mobile user experience. To learn more about Micron Technology, Inc. (Nasdaq: MU), visit micron.com.

[1] ABI Research, IoT Market Tracker – Worldwide, 2Q 2022

[2] Allied Market Research, IP Video Surveillance and VSaaS Market By Product Type (Hardware, Software, Cloud Based Solutions, and Services) and Application (Banking & Financial Sector, Retail, Government & Higher Security, Manufacturing & Corporate, Residential, Entertainment, Healthcare, and Others) — Global Opportunity Analysis and Industry Forecast, 2021-2030

[3] Assumes a bit rate of 1 megabit per second

[4] Gartner, Semiconductor and Electronics Forecast Database, Worldwide, 1Q22 Update

[5] Compares Micron's LPDDR5 with random fault coverage to like devices without safety features

[6] Compares Micron's LPDDR5 with random fault coverage to like devices without safety features

[7] Automotive market share calculated by revenue; Gartner, Market Share: Semiconductors by End Market, Worldwide, 2021

[8] Industrial market share calculated by revenue; OMDIA, Industrial Semiconductor Market Tracker — 4Q21 Analysis

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