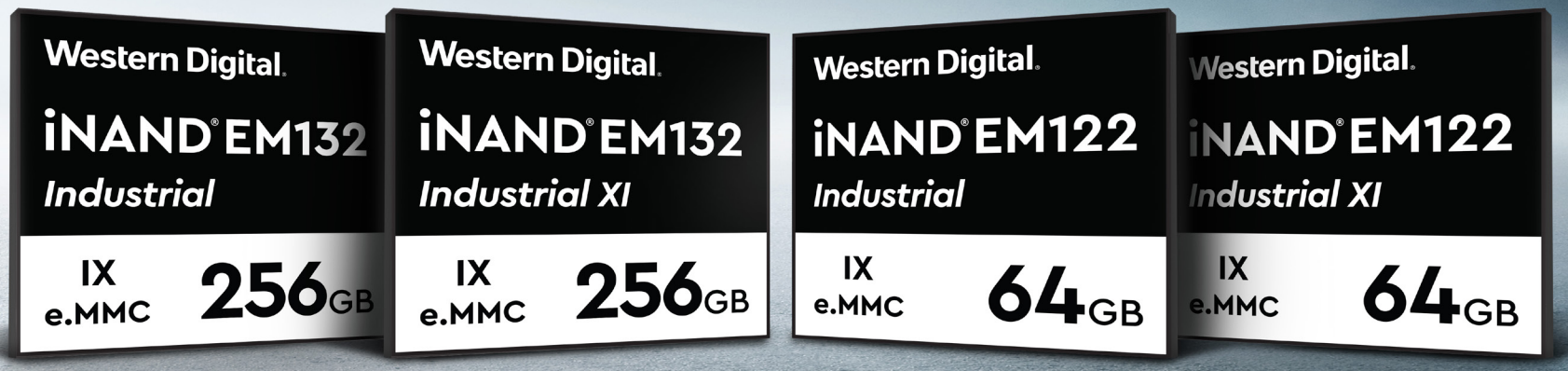
Western Digital.

Industrial-Grade e.MMC Embedded Flash Drives

With advanced features designed for your industrial and IoT applications

Western Digital's iNAND® industrial-grade e.MMC Embedded Flash Drives (EFDs) deliver robust storage solutions for industrial and IoT applications requiring high durability, high reliability, and high performance across a wide range of operational requirements. Smart partitioning, a sophisticated read refresh algorithm, power-fail immunity and additional advanced features make these some of the most advanced EFDs on the market. With industry-leading features including 3D technology, iNAND SmartSLC™, and deep diagnostics, you can trust Western Digital iNAND industrial-grade e.MMC EFD to get the job done under your most demanding conditions.


Western Digital.
iNAND® EM132
Industrial
IX
e.MMC
256GB
Western Digital.
iNAND® EM132
Industrial XI
IX
e.MMC
256GB
Western Digital.
iNAND® EM122
Industrial
IX
e.MMC
64GB
Western Digital.
iNAND® EM122
Industrial XI
IX
e.MMC
64GB

Advanced Features

3D Technology

- Higher performance, lower cost and lower power consumption
- Larger effective cell size and less cell-to-cell interference
- Higher reliability margins when compared to 2D NAND with similar bit density

SmartSLC

Western Digital's iNAND industrial-grade e.MMC features the industry-leading SmartSLC, designed to boost host write performance, leveraging the benefits of SLC to maximize device throughput and endurance.

Adaptive mechanisms ensure writes are routed through SLC blocks for superior write speeds and efficiently migrate data to TLC to ensure performance consistency.

Advantages:

Performance:

- Boost sequential and random write performance to SLC level
- SLC-grade latency for better write-driven use cases
- Maintain high performance when media is fragmented
- Persistent performance even when media is full

Endurance:

- Reduce host writes to the TLC area
- Increase product endurance and longevity (TBW)

Robustness:

- Leverage SLC's higher resiliency to data corruption
- TLC/SLC redundancy increases power failure handling

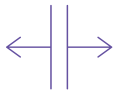
Advanced Features

Health Status Register Device Report

iNAND products offer a propriety device report feature, on top of the eMMC spec, with detailed information and diagnostics on the firmware and device status at runtime.

This information is available via an easy-to-use method, and provides a deeper EFD status understanding, including:

- Wear-leveling areas and device health
- Voltage droop and drop occurrences
- Power diagnostics
- Lifetime prediction
- Firmware release and update
- Host read and write
- Error detection and correction
- Temperature
- Failures and recovery



Smart Partitioning

The iNAND industrial-grade e.MMC Smart Partitioning implementation creates dedicated, physically separated and individually managed memory areas. This protects specific partitions from the unwanted effects of overuse as well as preventing any impact to the data integrity caused by activities in other areas, thus helping to maximize endurance, data retention and separation.

Separate areas may include:

- User area, typically configured as MLC/TLC memory
- SLC based High Data Retention / Read Intensive area
- SLC based High Endurance area, tailored for write intensive applications

Auto/Manual Read Refresh

- A sophisticated read refresh algorithm is implemented by the iNAND industrial-grade e.MMC to offer better handling of data retention, read disturb and read refresh. It senses early signs of block degradation and automatically refreshes the data
- The algorithm includes multiple types of scans, designed to identify affected pages with high Bit Error Rate (BER)

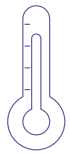
Advanced Features

Power Immunity

The iNAND industrial-grade e.MMC implements advanced mechanisms for protecting the device and the user data from data loss, data corruption or device damage due to external power failures. This addresses the occurrence of both write abort and voltage droops.

100% Content Preloading and integrity Post IR Reflow

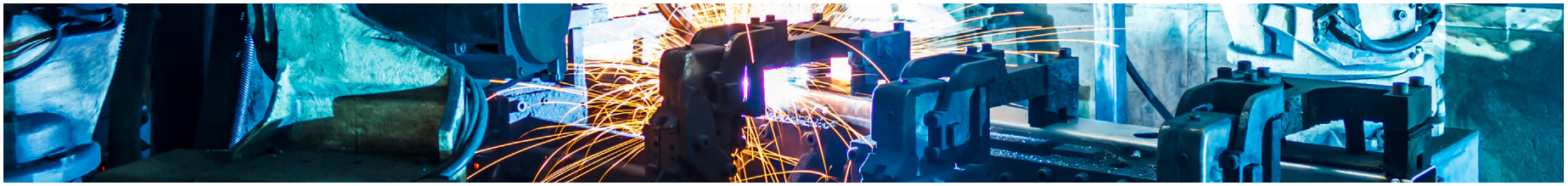
The iNAND industrial-grade e.MMC is designed to support 100% content preloading (via external programmer) pre-IR reflow and guarantee high data integrity post-IR reflow. This assures that the high temperature experienced during the IR-reflow process doesn't affect the data integrity of the preloaded data.



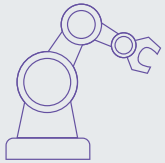
Thermal Management

To prevent the damage to the NAND or controller while operating in high temperatures, the iNAND industrial-grade e.MMC implements a robust thermal management mechanism.

This mechanism is activated by default and automatically adjusts the internal power mode to ensure protection from overheating.



Industrial Grade e.MMC Portfolio



	iNAND IX EM132	iNAND IX EM132 XI	iNAND IX EM122	iNAND IX EM122 XI
Interface	e.MMC 5.1			
Capacity (TB)	16GB – 256GB	32GB – 256GB	8GB – 64GB	8GB – 64GB
Operating Temperature	–25°C – 85°C	–40°C – 85°C	–25°C – 85°C	–40°C – 85°C
NAND Flash Technology	3D TLC	3D TLC	2D MLC	2D MLC
Sequential R/W (MB/s)	Up to 310/250	Up to 310/250	Up to 300/160	Up to 300/160
Random R/W (MB/s)	Up to 21K/12K	Up to 21K/12K	Up to 22K/14K	Up to 22K/14K
Features	Advanced Health Report, Auto and Manual Refresh, Smart Partitioning, Thermal Management		Advanced Health Report, Manual Refresh, Smart Partitioning, Thermal Management	
Packages	11.5×13×0.8mm – 11.5×13×1.2mm			
Ordering Information	SDINBDA6-###G-I1	SDINBDA6-###G-XI1	SDINBDG4-##G-I2	SDINBDG4-##G-XI2

Note: One gigabyte (GB) is equal to one billion bytes. Actual user capacity may be less due to operating environment.

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