



## Product Highlights

- Extreme endurance (Up to 1,120 TBW with TLC, 6,800 TBW with SLC)
- Wide operating temp range (-25°C to 95 °C)
- Broad capacity options (16GB to 256GB)<sup>1</sup>
- Advanced controller built for endurance and reliability
- Smart features including smart partitioning, advanced health report, auto & manual refresh, Smart SLC, and EUDA support
- Operating voltage of 2.7V to 3.6V
- Performance up to 250 MB/s write (projected) and 310 MB/s read to enable multiple high-bandwidth streams at 4K/UHD bitrates

## Applications

- STB, including Android™ TV STB
- Pause Live TV feature (time shift buffer), including multi-stream PLTV
- Local Lite DVR to provide seamless integration with cloud DVR services
- Push VOD (video on demand) to offload peak bandwidth consumption
- Home automation / network gateways
- OTT boxes
- Smart TVs
- Smart security cameras

## Business Benefits

- Enhanced customer experience for premium cDVR
- Simple and low-cost ad insertion at the edge
- Fast time to market
- Offload network traffic during peak times
- Reduce network latencies
- Reduce TCO for system/network architecture

## Western Digital® iNAND® CH EM133

### Continuing Western Digital's Leadership in Connected Home Solutions

Western Digital's iNAND CH EM133 Embedded Flash Drive (EFD) is designed specifically for Connected Home applications that require high endurance and high operating temperature support across a wide range of capacities. Developed with Western Digital's 3D NAND technology, the EM133 is the next generation of embedded storage that delivers a cost-effective solution with optimized performance to meet the most demanding reliability, endurance, and quality requirements from Telcos, MSOs and OEMs for designs that require constant and continuous writes to the storage, incorporating tailored features that ultimately reduce the total cost of ownership.

### Extending Cloud Architecture to Optimize TCO

The rapid adoption of streaming video and cloud-based DVR services have dramatically increased the demand for bandwidth, and poses scenarios that can drastically impact the user experience. Take a major sporting event for example: when a large number of users watching live TV (multicast stream) switches to a time-shifted video (unicast stream), this "pause-storm" will create a large spike in network load. To enable a smooth and consistent user experience with features such as pausing live TV, responsive rewind and fast-forwarding, and AI-enabled pre-positioning of VOD content, operators can incorporate local storage in the set top box (STB) as an extension of the cDVR / nDVR architecture, thus balancing the investment needed to increase infrastructure and bandwidth.

### Wide Range of Applications

Other devices for the connected home—such as Android STBs, over the top (OTT) devices, home gateways, smart TVs, and smart security cameras—are also designed to have content continuously recorded to the storage. As these devices are getting smaller and slicker by design and more versatile by functions, so are the requirements for their functionality, performance and reliability. Choosing the right NAND flash is an important decision for operators and OEMs to maintain a high level of customer satisfaction.

### Smart Features for Smart Applications

The EM133 device features advanced flash memory management firmware to provide enhanced power immunity, ECC, wear leveling, and bad block management. The Smart Partitioning feature allows Boot partitions, RPMB, multiple General-Purpose Partitions, User Data Area and Enhanced User Data Area, providing OEMs the flexibility to choose different attributes on a single device depending on storage requirements. Operators can rely on the EM133 to buffer and capture every second of video intensive applications, providing a seamless integration with cloud DVR services to ensure quality-of-service to end-users, while having direct access to the state of the storage to optimize maintenance deployments.

## iNAND CH EM133 EFD Product Features and Specifications

| Capacity <sup>1</sup>                      | 16GB                  | 32GB                     | 64GB                       | 128GB                      | 256GB                      |
|--|-----------------------|--------------------------|----------------------------|----------------------------|----------------------------|
| Interface                                  | eMMC 5.1 HS400        | eMMC 5.1 HS400           | eMMC 5.1 HS400             | eMMC 5.1 HS400             | eMMC 5.1 HS400             |
| Form Factor (mm)                           | 11.5mm x 13mm x 1.0mm | 11.5mm x 13mm x 1.0mm    | 11.5mm x 13mm x 1.0mm      | 11.5mm x 13mm x 1.0mm      | 11.5mm x 13mm x 1.2mm      |
| NAND Flash Technology                      | 3D NAND BiCS3 64L     | 3D NAND BiCS3 64L        | 3D NAND BiCS3 64L          | 3D NAND BiCS3 64L          | 3D NAND BiCS3 64L          |
| <b>Operating Voltage</b>                   |                       |                          |                            |                            |                            |
| Core Voltage (VCC):                        | 2.7–3.6V              | 2.7–3.6V                 | 2.7–3.6V                   | 2.7–3.6V                   | 2.7–3.6V                   |
| I/O (VCCQ) Voltage                         | 1.7–1.95V or 2.7–3.6V | 1.7–1.95V or 2.7–3.6V    | 1.7–1.95V or 2.7–3.6V      | 1.7–1.95V or 2.7–3.6V      | 1.7–1.95V or 2.7–3.6V      |
| <b>Operating Temperature</b>               | -25°C to 95°C         | -25°C to 95°C            | -25°C to 95°C              | -25°C to 95°C              | -25°C to 95°C              |
| <b>Performance<sup>2</sup></b>             |                       |                          |                            |                            |                            |
| Sequential Read/Write (MB/s)               | Up to 300/180         | Up to 330/170            | Up to 350/230              | Up to 350/250              | Up to 350/250              |
| Random Read/Write (IOPS)                   | Up to 14K/12K         | Up to 21K/12K            | Up to 22K/13K              | Up to 22K/13K              | Up to 22K/13K              |
| <b>Write Endurance (TLC)</b>               |                       |                          |                            |                            |                            |
| Total Terabytes Written (TBW) <sup>3</sup> | Up to 70TBW           | Up to 140TBW (projected) | Up to 280TBW (projected)   | Up to 560TBW (projected)   | Up to 1,120TBW (projected) |
| <b>Write Endurance (SLC)</b>               |                       |                          |                            |                            |                            |
| Total Terabytes Written (TBW) <sup>3</sup> | Up to 420TBW          | Up to 860TBW (projected) | Up to 1,720TBW (projected) | Up to 3,430TBW (projected) | Up to 6,800TBW (projected) |
| <b>Ordering Information</b>                | SDINBDA6-16G-H        | SDINBDA6-32G-H           | SDINBDA6-64G-H             | SDINBDA6-128G-H            | SDINBDA6-256G-H            |

<sup>1</sup> One megabyte (MB) is equal to 1,000,000 bytes and one gigabyte (GB) is equal to 1,000,000,000 bytes. Actual user capacity may be less due to operating environment.

<sup>2</sup> Based on internal testing; performance may be lower depending on host devices, usage, and other factors. Performance will vary by capacity point or with the changes in useable capacity. Consult product manual for further details.

<sup>3</sup> Approximations based on Western Digital internal metrics that quantifies how much data can be written to a card in its lifespan expressed in Terabytes Written (TBW), with write application of 1.