SanDisk® High Endurance Flash Devices for Connected Home

Enhancing end-user experience with Flash at the "Edge"

Product Highlights

- Available in SD™, USB and industry's first microSD™ formats
- Broad range of capacities: 4GB to 128GB
- Extreme durability supporting the toughest time shift buffer (TSB) specification requirements

Business Benefits

- Enables entry-level DVR
- Enables simple and low-cost ad-insertion at the edge
- Drives fast and cost-effective time-to-market
- Offloads network traffic during peak times
- Reduces network latencies
- Reduces TCO for system/network architecture

Connected Home Applications

- Smart TV
- Home entertainment
  — Pause live TV, trick play, rewind, DVR, PVR, nDVR and content prepositioning
- Home networking
  — Routers and modems with embedded form factors
- Home automation gateways
  — Security cameras, IoT gateway and energy management

Special Features

- Health status monitor
  — Tracks the life and usability of the card
- Host lock
  — Enables card to have a unique 1-to-1 attach to a system, so card cannot be used in another system
- Programmable string
  — Program a unique identifier on the card for remote tractability
- Secure firmware update
- Enables remote maintenance of the card
- High bandwidth support for streamed 4K/UHD content

Reliable Edge Storage in a Connected World

Traditionally, TV viewing features such as pause live TV and catch-up TV require a hard drive (HDD) within the set-top-box to enable the recording, storing and playback. To do so, a video buffer is created by constant recording and re-recording to the set-top-box to allow consumers to pause, rewind, play and fast-forward live programming.

Today, subscribers to live and streaming video services expect to access their content on-demand — anytime and anywhere. To meet that expectation, MSOs are transitioning to a cloud DVR architecture (cDVR) that allows the content to be stored in the cloud. This facilitates the whenever, wherever access of programming. This, however, dramatically increases bandwidth demand. Therefore, the hybrid model, with some local storage in the set-top-box combined with cloud storage, allows the MSO to balance the growing pressure in bandwidth and to reduce the investment for TCO and infrastructure. These benefits have seen this hybrid solution adopted rapidly over the last few years.

Other devices for connected home — such as set-top-box (STB), over the top (OTT), home gateway, smart TV, and smart security camera – 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.

NAND Flash has emerged as the ideal solution for storage in these devices. It is worth noting that NAND Flash has a finite number of write cycles (NAND Endurance) correlated with the amount of time the data will stay valid (data retention) and the write performance of the memory module. Therefore, it is important to customer satisfaction as well as the bottom line for MSOs to decide on the right NAND Flash for product implementation.

Card Life Expectancy

	Life Expectancy	Endurance
Normal Card	Less than 2 month	
SanDisk High Endurance Card	Over 150 month	Over 100X than regular card

Pause Live TV use case at 12Mbps for 8hrs a day

The SanDisk High Endurance product line for connected home is specifically designed to optimize performance for applications that require constant and continuous writes to the card. They are built to meet the MSO's special reliability, endurance, and quality requirements and provide additional tailored features that will help reduce the total cost of ownership by enabling remote support and maintenance by MSOs.

SanDisk High Endurance Product Line

Specifications	Video Buffer			DVR Supplement	DVR Lite
Capacity[1]	8GB – 16GB	16GB	4GB – 8GB	32GB – 128GB	32GB – 128GB
Interface	SD, microSD	USB	SD , microSD	SD, microSD	USB
NAND Flash Technology	X2 (eMLC)	X2 (eMLC)	X1 (SLC)	X2 (eMLC)	X3 (TLC)
Operating Temp	-0°C to 85°C	-0°C to 55°C	-0°C to 85°C	-0°C to 85°C	-0°C to 55°C
Tera Byte Write[3] (Endurance)	Up to 160TBW	Up to 160TBW	Up to 400TBW	Up to 896TBW	Up to 128TBW
Performance					
Sequential Write/Read (Mbps)[2]	Up to 160/400	40/56	Up to 400/400	Up to 240/400	Up to 80/160
Features					
Host lock	√	√	√	√	√
Secure Firmware Update	√		√	√	
Health Status Monitor	√	√	√	√	√

Ordering Information

USB		SDUFDEC-016G			SDUFDEA-032G-128G
SD	SDSDEC-008G-16G		SDSDEC-004G	SDSDEB-032G-128G	
microSD	SDSDQEB-08G-16G		SDSDQEC-004G-08G	SDSDQEB-032G-64G	

[1] 1GB=1,000,000,000 bytes. Actual user storage less.

[2] Based on internal testing; performance may be lower depending on host device, usage and other factors. 1MB=1,000,000 bytes.

[3] Approximations based on SanDisk internal metrics that quantify how much data can be written to a card during its lifespan, expressed in Terabytes Writes (TBW), with write application of 1.

Flash at the "Edge" is also available as an embedded solution

The SanDisk Advantage

SanDisk, a Western Digital brand, has more than 28 years of expertise in NAND flash development and system design. With a vertically integrated business model, SanDisk products come with world-class technical and design support, as well as BOM control with PCN support.

Contact information

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