# iNAND™ eSD/eMMC Embedded Flash Drive

Design in More

The SanDisk® iNAND eSD/eMMC family of high capacity Embedded Flash Drives (EFDs) lets mobile handset designers give users more memory, up to 16GB, for more multimedia functionality. iNAND uses standard interfaces and ball-out configurations, combined with advanced, cost-effective multilevel cell (MLC) NAND flash in a small form factor with an internal controller and dedicated firmware. Designed specifically for advanced multimedia handsets, iNAND offers high performance and reliability for the ultimate mobile user experience.

Today's advanced multimedia handsets benefit from continually advancing technologies to offer new, added value features such as higher resolution imaging, larger screens, better video quality, music playback, global positioning systems and other dazzling applications. In recent years, mobile users have been requiring greatly increasing storage each year for immediate access to premium content and an enhanced multimedia experience.

Main Features and Benefits

iNAND eSD and eMMC

SanDisk's iNAND family of embedded flash drives utilize industry standard eSD and eMMC interfaces. This makes integration a snap. A high-speed data bus delivers maximum performance, while providing an optimal solution for multimedia handsets that require tight routing due to design constraints and limited space.

Raw
NAND SLC

Host | Flash Mgt Software | Flash Controller

NAND I/F

NAND SLC
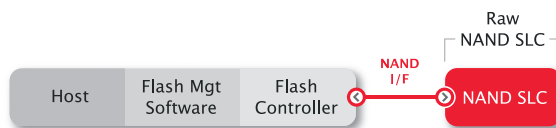
- Boot
- No MLC NAND support – low capacity
- Software efforts needed
- Backward compatibility not guaranteed for every technology transition

iNAND eSD/eMMC

Host

SD I/F

Flash Mgt Software | Flash Controller | NAND MLC
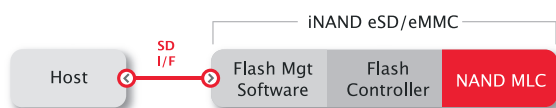
- Boot
- MLC NAND support – scalable high capacity
- No software efforts needed
- Backward compatible for every technology transition

SanDisk®

More Reliable

The true value behind the iNAND family of embedded flash drives is advanced flash management that handles MLC NAND transparently to the host, while providing full block device emulation and a disk-like interface. Robust error detection and correction engines, automated bad block management and advanced wear leveling ensure optimal storage and boot functionality.

More Functionality in One Device

iNAND eSD/eMMC is a reliable code storage and boot device. Managed physical partitions, customizable levels of protection and power failure immunity, offer a system solution which allows boot code to be safely stored and accessed via the SD interface. Eliminating the need for an additional boot code storage device and a NOR or NAND interface substantially reduces system design complexityand cost.

Ease of Design Redefined

iNAND eSD/eMMC comes in a wide range of storage capacities and packages with up to 16GB NAND flash. It is also available as part of an MCP configuration with up to 2Gb of low-power DRAM. All iNAND and iNAND-based MCP products share the same ballout and design requirements, allowing customers to design once for several projects with scaling storage capacities.

Why iNAND?

- **Advanced flash technology** – Access the latest, cost-effective generation of SanDisk advanced MLC NAND flash technology.

- **Standard interface and form factor** – Simplify integration with industry leading eSD and eMMC interfaces and standard packaging.

- **High performance** – Enhance the user experience with rates as high as 15MB/s read and 9MB/s write.

- **Powerful flash management** – Depend on SanDisk technology to internally ensure flash reliability and off-load tasks from the host.

- **Boot and storage in one device** – Save space and reduce design complexity by catering to both boot and storage needs.

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SanDisk iNAND eSD Family of Products

Capacity	4Gb-128Gb (512MB-16GB)
Interface**	SD2.0/eSD2.1 and eMMC 4.3
NAND flash technology	SanDisk MLC
Package (mm)	Discrete: 11.5x13, 12x16, 12x18 MCP: 12x16
SanDisk flash management	Embedded firmware
Performance	Sustained read: 15MB/sec Sustained write: 9MB/sec
Operating voltage	Core: 3.3V, I/O: 3.3V/1.8V (auto-detect)
Power-save mode	250uA
Active current	Default: 100mA, high speed: 200mA

* 1 gigabyte (GB) = 1 billion bytes; 1 megabyte (MB) = 1 million bytes; speed based on internal testing; performance may be lower depending on host device. Some capacity not available for data storage.
** Also available with MMC interface.

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