

SanDisk® *iNAND*™

The high-capacity, high performance single-package system solution for embedded flash data storage applications

Flash application usage and storage requirements continue to increase with no end in sight. Today's new consumer devices demand larger amounts of embedded flash storage to permanently store data, applications and operating systems.

The SanDisk iNAND is a high capacity, high performance single-package flash memory device with built-in controller that's ideal for storing audio, video, images and other data on small portable systems such as mobile phones, digital audio/MP3 players, gaming, personal media players, PDAs and more.

Using reliable NAND flash memory and based on the industry-standard serial SD™ or SPI interface, SanDisk iNAND offers significant design and manufacturing advantages over other flash data storage solutions—including greater design flexibility and scalability, seamless technology transitions, and faster time to market.

SanDisk iNAND is currently available in 256MB, 512MB, 1GB, 2GB and 4GB* capacities. As the world's largest supplier of flash data storage products, SanDisk continues to lead the industry in the ongoing evolution of application memory solutions.

*1 megabyte (MB)=1 million bytes, 1 gigabyte (GB)=1 billion bytes. Some of the listed capacity is used for formatting and other functions, and thus is not available for data storage.





Introducing SanDisk iNAND. . . the simple, seamless and scalable solution for today's embedded applications

High-capacity embedded flash storage in a small, easy-to-use package

The SanDisk iNAND combines high capacity, low cost, small size, proven reliability, and easy upgradeability to meet the increasingly stringent requirements of today's storage-hungry applications. SanDisk iNAND provides system designers and manufacturers with a variety of innovative features and major benefits, including:

Small Size—offers high capacity in a small footprint (12mm by 18mm by 1.2mm/1.4mm thick)

High Capacity—available in 256MB, 512MB, 1GB, 2GB and 4GB

Outstanding Scalability—provides the same physical form factor (footprint) for a wide range of capacities; offers easy upgradeability and design flexibility

High Performance—minimize time to download data and maximize host performance

Industry-standard Interface—runs on an industry-standard serial SD™ or SPI interface; offers low pin count for designs with tight routing (i.e., mobile phones and digital audio players); minimizes design risk; fully backward compatible

Simple Memory Management—includes on-board controller to eliminate the need for host memory management and separate software development; provides seamless memory component technology transitions; simple interface enables easy board layout

Perfect for HDD replacement

As the price of flash continues to decline, the opportunity to replace HDD-based applications with a smaller, solid state, lower power, faster flash-based solution has grown. The wide range of capacities (256MB to 4GB) supported by iNAND enables large amounts of flash storage at prices similar to, or lower than the price of an HDD. If you are using a HDD in a consumer electronics application, you need to take a long hard look at iNAND.

SanDisk iNAND is superior to other embedded flash solutions.

Here's why...

Unlike other embedded solutions, SanDisk iNAND is a self-contained, single-package system with on-board controller that offers significant design and manufacturing advantages over solutions that not only require host software drivers now, but may also require firmware changes to the host with new flash technologies in the future.

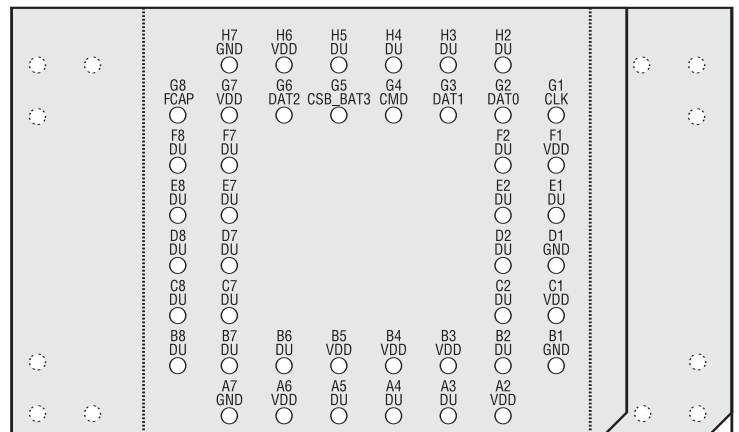
As flash technologies continue to advance, it will become increasingly more difficult for many system designers and manufacturers to take advantage of the lower cost structure and higher performance that MLC (Multi Level Cell) offers. For the past five years, SanDisk engineers have been refining the hardware and firmware to manage this level of NAND/MLC advanced 32-bit controller architecture. Integrating SanDisk iNAND is the most expedient way for OEMs to benefit from the advantages of MLC and its improved cost structure.

What's more, two-component solutions that require an external controller make it more complex and difficult to design, and create a potential "dual vendor" problem concerning support issues. SanDisk iNAND is a totally integrated solution. No special host software is required!



iNAND Pinout

Pin Number	SD/SPI	Control Function
G7, H6, F1, C1, B5, B4, B3, A6, A2	VDD	Power
H7, H2, D1, B1, A7	VSS	Ground
G2	SD_DAT0	Data Line 0
G3	SD_DAT1	Data Line 1
G6	SD_DAT2	Data Line 2
G5	SD_DAT3 / SPI_CS	SD Data Line 3 / SPI, Chip Select
G1	SD_CLK	Clock Line
G4	SD_CMD	Command Line
G8	FCAP	Power Supply Grounded Filter Capacitor



DU = Don't Use

TOP VIEW

Pin A1 ID

specifications**

Interface	SPI or SD
System Performance (notes 1&2)	
Sequential Read	10.0MB/sec
Sequential Write	5.0MB/sec
Power Requirements	
DC Input Voltage	2.7V to 3.6V
Typical Power Dissipation (notes 3&4)	
Sleep	250 µA typ.
Read	100 mA typ.
Write	100 mA typ.
Environmental Specifications	
Temperature	
Operating	-25 to +85°C
Non-Operating	-40 to +85°C
Humidity	
Operating/Non-Operating	8-95%, non-condensing
Vibration	
Operating/Non-Operating	15 G peak to peak max.
Shock	
Operating/Non-Operating	1,000 G max.
Altitude (relative to sea level)	
Operating/Non-Operating	80,000 feet max.
Reliability and Maintenance	
MTBF (Mean Time Between Failures)	>1,000,000 hours
Preventive Maintenance	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read
Physical Specifications	
Length	18mm
Width	12mm
Height	1.2mm for 256MB, 512MB, 1024MB 1.4mm for 2048MB, 4096MB
Ordering Information	
Order Model #	SDINB1-YYYY
YYY=Capacity	256 256.0MB 512 512.0MB 1024 1024.0MB 2048 2048.0MB 4096 4096.0MB

**Specifications subject to change without notice.

Note 1:
All values quoted are typical at ambient temperature and nominal supply voltage unless otherwise stated.

Note 2:
All performance timing assumes the host is in the default (i.e. fastest) SD mode.

Note 3:
Sleep mode currently is specified under the condition that all card inputs are static CMOS levels and in a "Not Busy" operating state. The SD clock pin is idle.

Note 4:
The current specified show the bounds of programmability of the product.

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