

More people rely on SanDisk® memory cards than any other brand in the world, and for good reasons. As a pioneer and leader in the field, SanDisk designs and manufactures its own NAND flash memory, designs state-of-the-art controllers, develops the complete card design, and has complete control of the manufacturing process. Through this capability, and by staying very close to the customers and the markets served, SanDisk is able to continually set the standard for quality, reliability and performance.



Flash Memory Storage Solutions From the Worldwide Flash Card Leader.



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	CompactFlash	SanDisk Ultra II CompactFlash®
Interface	PC Card ATA True IDE Mode	PC Card ATA True IDE Mode
Performance (Notes 1 & 2) Interface Transfer Speed (Max)	16.6 MB/sec	16.6 MB/sec
Power Requirements (Note 1) DC Input Voltage	3.3V ± 5%, 5V ± 10%	3.3V ± 5%, 5V ± 10%
Typical Power Dissipation (Notes 3 & 4)		
Sleep	300 µA (3.3V)	500 µA (5V)
Read (Typical)	<50 mA RMS (3.3V)	<55 mA RMS (5V)
Write (Typical)	<65 mA RMS (3.3V)	<70 mA RMS (5V)
Environmental Specifications		
Temperature		
Operating Commercial	0–70°C	0–70°C
Non-Operating Commercial	–25–85°C	–25–85°C
Humidity		
Operating	8–95%, non-condensing	8–95%, non-condensing
Non-Operating	8–95%, non-condensing	8–95%, non-condensing
Acoustic Noise (at 1 meter)	0 dB	0 dB
Vibration		
Operating	15 G peak to peak max.	15 G peak to peak max.
Non-Operating	15 G peak to peak max.	15 G peak to peak max.
Shock		
Operating	2,000 G max.	2,000 G max.
Non-Operating	2,000 G max.	2,000 G max.
Altitude (relative to sea level)		
Operating/Non-Operating	80,000 feet max.	80,000 feet max.
Reliability and Maintenance		
MTBF (Mean Time Between Failures)	>1,000,000 hours	>1,000,000 hours
Preventive Maintenance	None	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read	<1 non-recoverable error in 10 ¹⁴ bits read
Physical Specifications	CompactFlash	Ultra II CompactFlash
Length	1.433 in (36.4 mm)	1.433 in (36.4 mm)
Width	1.685 in (42.8 mm)	1.685 in (42.8 mm)
Height (Body)	0.130 in (3.30 mm)	0.130 in (3.30 mm)
Height (Removable Edge)	0.155 in (3.94 mm)	0.155 in (3.94 mm)
Weight	0.40 oz (11.4 g)	0.40 oz (11.4 g)
Ordering Information		
Order Model	SDCFJ-YYY	SDCFH-YYY
YYY:	64 64.2 MB 128 128.4 MB 256 256.9 MB 512 512.4 MB 1024 1024.9 MB 2048 2048.9 MB 4096 4096.3 MB	1024 1024.9 MB 2048 2048.9 MB 4096 4096.3 MB 8192 8192.6 MB 16384 16384.0 MB

Specifications subject to change without notice

Other versions available:

B: Standard
H: "Ultra" High-Speed
J: MLC/NAND
I: Industrial Temperature
Note: Capacities may vary by product family. Consult your SanDisk Sales Representative for correct ordering part numbers.

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

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

• **SanDisk CompactFlash®**

SanDisk CompactFlash revolutionized handheld electronics with unprecedented functionality when CompactFlash was first invented. The CompactFlash memory card's matchbook size and half-ounce weight make it the ideal solution for small devices that need high capacity flash memory. Today, the CompactFlash storage specification is the industry-standard for next-generation, small form factor consumer applications such as digital cameras and handheld PCs that need very high capacities. CompactFlash is available in capacities up to 4GB* and the SanDisk Ultra® II CompactFlash is available in capacities up to 16GB.



• **SanDisk RS-MMC™ (Reduced-Size MultiMediaCard)**

The SanDisk RS-MMC is designed for use in the newest generation of ultra-small mobile phones. It is about half the size of a standard MultiMediaCard, and has the same simple, low power interface. This allows the RS-MMC to be used with an extender in a full size MMC slot. The RS-MMC is available in 64MB, 128MB, 256MB, 512MB and 1GB capacities.



* 1 megabyte (MB) = 1 million bytes;
1 gigabyte (GB) = 1 billion bytes

• **SanDisk Memory Stick PRO Duo™ Card**

The SanDisk Memory Stick PRO Duo card provides high capacity memory with the data transfer speeds of the Memory Stick PRO Interface. It was designed for use in the newest generation of mobile phones, digital still cameras, video cameras, digital music players and other size-sensitive mobile devices. The Memory Stick PRO Duo cards are also very secure with Advanced MagicGate™ copy protection included. Available in 32MB, 64MB, 128MB, 256MB, 512MB, 1GB and 2GB capacities.



• **SanDisk iNAND™**

SanDisk iNAND is a single chip device ideal for storing audio, video, images and other data on small portable systems such as mobile phones, MP3 players and GPS devices. It has a simple, high-performance serial interface that follows the industry standard SD or SPI protocols. This allows iNAND to be seamlessly integrated into designs that already have a memory card slot. iNAND is available today in 256MB, 512MB, 1GB and 2GB capacities.



• **SanDisk USB Flash Drive (UFD)**

The SanDisk UFD is available in 64MB, 128MB, 256MB, 512MB, 1GB and 2GB capacities. It is Hi-Speed USB 2.0 compliant. This drive was specifically designed to allow unique customization on the label. The SanDisk UFD is slim enough to plug into any USB port without obstructing adjacent ports.





	microSD	SD Card
Interface	SD or SPI	SD or SPI

Performance (Notes 1 & 2)		
Interface Transfer Speed (Max)	25 MB/sec	25 MB/sec

Power Requirements (Note 1)		
DC Input Voltage	2.7V-3.6V	2.7V-3.6V

Typical Power Dissipation (Notes 3 & 4)		
Sleep	150 µA	250 µA
Read	50 mA	70 mA
Write	60 mA	80 mA

Environmental Specifications		
Temperature		
Operating Commercial	-25-85°C	-25-85°C
Non-Operating Commercial	-40-85°C	-40-85°C
Humidity		
Operating	25°C/85% rel. humidity	25-95%, non-condensing
Non-Operating	40°C/85% rel. humidity	25-95%, non-condensing
Acoustic Noise (at 1 meter)	0 dB	0 dB
Vibration		
Operating	15 G peak to peak max.	15 G peak to peak max.
Non-Operating	15 G peak to peak max.	15 G peak to peak max.
Shock		
Operating	1,000 G max.	1,000 G max.
Non-Operating	1,000 G max.	1,000 G max.
Altitude (relative to sea level)		
Operating/Non-Operating	80,000 feet max.	80,000 feet max.

Reliability and Maintenance		
MTBF (Mean Time Between Failures)	>1,000,000 hours	>1,000,000 hours
Preventive Maintenance	None	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read	<1 non-recoverable error in 10 ¹⁴ bits read

Physical Specifications		
Length	11 mm	32 mm
Width	15 mm	24 mm
Height (Body)	1.0 mm	2.1 mm
Height (Removable Edge)	N/A	N/A
Weight	0.40 g. max.	2.0 g. max.

Ordering Information		
Order Model #	SDSDQ-YYY	SDSDJ-YYY

YYY:	64 64.2 MB	64 64.2 MB
	128 128.2 MB	128 128.2 MB
	256 256.2 MB	256 256.2 MB
	512 512.4 MB	512 512.4 MB
	1024 1024.9 MB	1024 1024.9 MB
		2048 2048.9 MB

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 controller is in the default (i.e., fastest) mode.

	SanDisk Ultra II SD Card	miniSD
Interface	SD	SD or SPI

Performance (Notes 1 & 2)		
Interface Transfer Speed (Max)	25 MB/sec ≥256 MB	25 MB/sec ≥256 MB 12.5 MB/sec ≤128 MB

Power Requirements (Note 1)		
DC Input Voltage	2.7V-3.6V	2.7V-3.6V

Typical Power Dissipation (Notes 3 & 4)		
Sleep	250 µA	150 µA
Read	75 mA	50 mA
Write	75 mA	60 mA

Environmental Specifications		
Temperature		
Operating Commercial	-25-85°C	-25-85°C
Non-Operating Commercial	-40-85°C	-40-85°C
Humidity		
Operating	25-95%, non-condensing	8-95%, non-condensing
Non-Operating	25-95%, non-condensing	8-95%, non-condensing
Acoustic Noise (at 1 meter)	0 dB	0 dB
Vibration		
Operating	15 G peak to peak max.	15 G peak to peak max.
Non-Operating	15 G peak to peak max.	15 G peak to peak max.
Shock		
Operating	1,000 G max.	1,000 G max.
Non-Operating	1,000 G max.	1,000 G max.
Altitude (relative to sea level)		
Operating/Non-Operating	80,000 feet max.	80,000 feet max.

Reliability and Maintenance		
MTBF (Mean Time Between Failures)	>1,000,000 hours	>1,000,000 hours
Preventive Maintenance	None	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read	<1 non-recoverable error in 10 ¹⁴ bits read

Physical Specifications		
Length	32 mm	21.5 mm
Width	24 mm ± 0.08 mm	20.0 mm
Height (Body)	2.1 mm ± 0.1 mm	1.4 mm
Height (Removable Edge)	N/A	N/A
Weight	2.0 g. max.	1.0 g. max.

Ordering Information		
Order Model #	SDSDH-YYY	SDSDM-YYY

YYY:	1024 1024.9 MB	64 64.2 MB
	2048 2048.9 MB	128 128.2 MB
		256 256.2 MB
		512 512.4 MB
		1024 1024.9 MB
		2048 2048.9 MB

Specifications subject to change without notice

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.

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

SanDisk offers a broad range of flash data storage products, including memory modules, CompactFlash®, SD™, miniSD™, microSD™, RS-MMC™, USB and Memory Stick PRO Duo™. All of these products share the leading edge technology for which SanDisk is known.

SanDisk is the inventor or co-developer of most of the flash memory card form factors on the market today, including CompactFlash, MultiMediaCard, SD, Memory Stick PRO™, iNAND™ and microSD.

In 2000, SanDisk entered into a joint flash fabrication venture called FlashVision LLC, which produces NAND wafers at a plant located in Yokkaichi, Japan. In 2002, SanDisk launched the world's first Multi-Level Cell NAND-based flash memory products, and today SanDisk is one of only two companies manufacturing MLC NAND flash memory.

Beyond the core flash memory technology, SanDisk continues to evolve flash card functionality and performance levels to meet the needs of emerging applications such as mobile phones, PDAs, portable audio, digital video, digital imaging and more. This brochure highlights all of the products currently available for OEM customers. For more accurate and up-to-date product information and specifications, please visit the SanDisk website at www.sandisk.com.

• **SanDisk microSD™ Card**

Measuring just 11mm by 15mm and 1mm thick, the SanDisk microSD card is the ultimate storage solution for the next generation of increasingly compact mobile phones. Two-thirds the size of a SIM module, microSD card are even smaller than many embedded memory devices. Available in capacities ranging from 64MB to 1GB, the SanDisk microSD card gives mobile phone designers and manufactures more flexibility.



In addition, the SanDisk microSD removable card makes it easy for mobile phone users to transport their personal content like saved photos, music files, high fidelity ring tones, applications, and system settings from one mobile phone to another when they need to upgrade their phone or service.

• **SanDisk SD™ Card**

The SD card is a flash memory storage device designed to meet the security, capacity and performance requirements inherent in the latest consumer electronics devices. Key enhancements over the MultiMediaCard include cryptographic security for protection of copyrighted data, more than a 5X improvement in maximum data transfer rate, and a user selectable write protect switch on the card casing. The standard SD is offered in capacities from 64MB to 2GB and the SanDisk Ultra II SD is available in 1GB and 2GB capacities.



• **SanDisk miniSD™ Card**

The miniSD card is designed specifically to meet the needs of today's small mobile phones. SanDisk miniSD is based on the popular SD card. It uses the same powerful, simple, high performance interface SD offers. The miniSD offers full compatibility and interoperability with any SD host by using an available passive adapter. The SanDisk miniSD card is available in capacities from 64MB to 2GB.



	RS-MMC	Memory Stick PRO Duo		
Interface	MultiMediaCard or SPI	Memory Stick PRO	Interface	SD or SPI
Performance (Notes 1 & 2) Interface Transfer Speed (Max)	2.5 MB/sec	20 MB/sec	Performance (Notes 1 & 2) Interface Transfer Speed (Max)	25 MB/sec
Power Requirements (Note 1) DC Input Voltage	2.7V-3.6V	2.7V-3.6V	Power Requirements (Note 1) DC Input Voltage	2.7V-3.6V
Typical Power Dissipation (Notes 3 & 4) Sleep Read Write	150 µA 50 mA 60 mA	Typical 125 µA <50 mA <75 mA	Max 1 mA 65 mA 100 mA	Typical Power Dissipation (Notes 3 & 4) Sleep Read Write

Environmental Specifications		Environmental Specifications	
Temperature Operating Commercial Non-Operating Commercial	-25-85°C -40-85°C	-25-85°C -40-85°C	-25-85°C -40-85°C
Humidity Operating Non-Operating	8-95%, non-condensing 8-95%, non-condensing	25-85%, non-condensing Max 95% (saturated state)	8-95%, non-condensing 8-95%, non-condensing
Acoustic Noise (at 1 meter)	0 dB	0 dB	0 dB
Vibration Operating Non-Operating	15 G peak to peak max. 15 G peak to peak max.	15 G peak to peak max. 15 G peak to peak max.	15 G peak to peak max. 15 G peak to peak max.
Shock Operating Non-Operating	1,000 G max. 1,000 G max.	1,000 G max. 1,000 G max.	1,000 G max. 1,000 G max.
Altitude (relative to sea level) Operating/Non-Operating	80,000 feet max.	80,000 feet max.	80,000 feet max.

Reliability and Maintenance		Reliability and Maintenance	
MTBF (Mean Time Between Failures)	>1,000,000 hours	>1,000,000 hours	>1,000,000 hours
Preventive Maintenance	None	None	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read	<1 non-recoverable error in 10 ¹⁴ bits read	<1 non-recoverable error in 10 ¹⁴ bits read

Physical Specifications		Physical Specifications	
Length	18 mm	20 mm	18 mm
Width	24 mm	31 mm	12 mm
Height (Body)	1.4 mm	1.6 mm	1.2 mm max (256 & 512 MB/1 GB) 1.4 mm (2 GB & 4 GB)
Height (Removable Edge)	N/A	N/A	N/A
Weight	1.0 g. max.	2.0 g. max.	0.40 g. max.

Ordering Information		Ordering Information	
Order Model #	SDMJ-YYY	SDMSPD-YYY	SDINB1-YYY
YYY:	64 64.2 MB 128 128.4 MB 256 256.9 MB 512 512.4 MB 1024 1024.9 MB	64 64.2 MB 128 128.4 MB 256 256.9 MB 512 512.4 MB 1024 1024.9 MB 2048 2048.9 MB	256 256.2 MB 512 512.4 MB 1024 1024.9 MB 2048 2048.9 MB

Specifications subject to change without notice

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.

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

Specifications subject to change without notice