

The Universal Storage Solution. From the Worldwide Flash Storage Leader.



SanDisk storage products continue to set new standards for performance, reliability and cost. And for a lot of good reasons. All of our storage solutions are high-capacity, solid-state, non-volatile flash memory products that comply with industry standards.

SanDisk currently offers a wide variety of flash data storage products: CompactFlash®; Secure Digital™; the PC Card ATA FlashDisk; MultiMediaCard; FlashDrive; SmartMedia™; and embedded solutions storage. All products share SanDisk's proprietary leading edge technology.

SanDisk ATA/IDE and serial interface products are 100% compatible with virtually all of today's computing and communications systems, including popular operating systems such as MS DOS, Windows, Windows CE, Windows 95, Windows 98, Windows 2000, Windows Me, Windows XP, Windows NT, OS/2, UNIX, NEC OS, DOS V, PSOS, and MacOS System 7 or greater. Plus, there's no need to license special flash file systems.

Supporting multiple voltage operation, SanDisk products provide the design flexibility to meet a broad array of applications. SanDisk's newest generation of flash memory technology — 1Gbit MLC flash — has given rise to the world's first 1GB Type I CompactFlash card.

Compared to other memory technologies, flash data storage offers superior performance in terms of compatibility, ruggedness, reliability, capacity, small size, and low power consumption. Only SanDisk has the enabling technology to design those requirements into today's most advanced industrial, consumer electronics, computing and communications applications.



- **SanDisk CompactFlash®**

SanDisk CompactFlash is revolutionizing handheld electronics with unprecedented functionality. 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. CompactFlash is available in capacities up to 1.0GB.



- **SanDisk Secure Digital (SD) Card**

The Secure Digital (SD) Card is a flash memory storage device designed by the consortium of Matsushita Electric (Panasonic), SanDisk, and Toshiba to meet the security, capacity and performance requirements inherent in emerging audio and video consumer electronics devices. Key enhancements over the MultiMediaCard include cryptographic security for protection of copyrighted data, up to a 4X improvement in maximum data transfer rate, and a user selectable write protect switch on the card casing. Storage capacities offered are 16, 32, 64, 128, and 256MB, with 512MB available in the second half of 2002.



- **SanDisk MultiMediaCard**

SanDisk's MultiMediaCard is the world's smallest solid-state storage device. Available in 16, 32 or 64MB capacities, with 128MB cards available by the first half of year 2002, the MultiMediaCard brings removable flash memory storage capabilities to digital video camcorders and cellular phones. Weighing less than two grams and about the size of a postage stamp, the MultiMediaCard is designed to meet the unique requirements of portable communications and computing markets for small size, upgradable capacities, forward and backward compatibility, and low cost.



- **SanDisk PC Card ATA FlashDisk Series**

Ideal for storage, data backup and data transport applications, SanDisk's FlashDisk products are the highest capacity removable ATA industry-standard PC cards currently available. FlashDisks are ideal for applications that need storage but also need low power or a very rugged storage solution. Type II FlashDisks are available in capacities up to 2.0GB.

What's more, systems that support the SanDisk FlashDisk cards today will be able to access future SanDisk cards built with the latest Flash technology—without having to update or change host software.



Embedded Solutions

- **SanDisk NAND Flash**

SanDisk NAND Flash provides OEM designers with a complete line-up of non-volatile memory solutions for data storage and code storage applications. SanDisk NAND Flash is ideally suited for cell phones, digital music players, digital cameras, camcorders and digital voice recorders, where performance is critical due to its high-speed programming capability, high-speed erasing and small block size. NAND Flash is available in 64, 128, 256, 512, 1024 and 2048Mbit densities.



- **SanDisk FlashDrive Series**

SanDisk FlashDrives are IDE disk drive-compatible replacement products. SanDisk's industry-leading FlashDrive 2.5" is designed to replace traditional rotating disk drives in a growing number of applications such as networking, industrial computers, telecommunications, gaming, military, avionics and POS (Point-of-Sale) systems. The 2.5" FlashDrive is available in storage capacities up to 2.0GB.



- **SanDisk TriFlash**

SanDisk TriFlash is a single chip device ideal for storing audio, video, images and other data on small portable systems such as smart phones, MP3 players and handheld computers. It has a simple, high-performance serial interface that follows the industry standard SPI, MultiMediaCard, or SD Card protocols. This allows the TriFlash to be seamlessly integrated into designs that already have a memory card slot. TriFlash is easy to design into virtually any microprocessor/microcontroller platform. TriFlash is available today in 128, 256 and 512Mbit capacities.



- **SanDisk SmartMedia™ Card**

SanDisk's SmartMedia card is used in digital cameras, digital music players, and other consumer electronics devices. This product, which uses NAND Flash memory technology, provides up to 128MB of memory storage in a small, thin package that is quick and easy to install and remove. SanDisk SmartMedia cards provide a low cost, lightweight solution for removable FLASH storage and is compatible with devices that have the SmartMedia logo.



	CompactFlash		PC Card ATA Flash	
Interface	PC Card ATA and True IDE Mode		PC Card ATA and True IDE Mode	
System Performance (Notes 1 & 2)				
Data Transfer Rate to/from Host	16.0 MB/sec burst		16.0 MB/sec burst	
Power Requirements (Note 1)				
DC Input Voltage				
Commercial	3.3V ± 5%, 5V ± 10%		3.3V ± 5%, 5V ± 10%	
Industrial	3.3V ± 5%, 5V ± 10%		3.3V ± 5%, 5V ± 5%	
Typical Power Dissipation (Notes 3 & 4)				
Sleep	200 µA (3.3V)	500 µA (5V)	200 µA (3.3V)	500 µA (5V)
Read	21 mA RMS (3.3V)	34 mA RMS (5V)	35 mA RMS (3.3V)	50 mA RMS (5V)
Write	21 mA RMS (3.3V)	34 mA RMS (5V)	35 mA RMS (3.3V)	50 mA RMS (5V)
Environmental Specifications				
Temperature				
Operating Commercial	0–60°C		0–60°C	
Operating Industrial	-40–85°C		-40–85°C	
Non-Operating Commercial	-25–85°C		-25–85°C	
Non-Operating Industrial	-50–100°C		-50–100°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.		1,000 G max.	
Non-Operating	2,000 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	CompactFlash	CF Adapter		
Length	1.433 in (36.4 mm)	3.370 in (85.6 mm)	3.370 ± .008 in (85.6 ± 0.20 mm)	
Width	1.685 in (42.8 mm)	2.126 in (54.0 mm)	2.126 ± .004 in (54.0 ± 0.10 mm)	
Thickness (Body)	0.130 in (3.30 mm)	0.1968 in (5.0 mm)	.1968 in (5.0 mm max.)	
Thickness (Removable Edge)	0.155 in (3.94 mm)	N/A	N/A	
Weight	0.40 oz (11.4 g)	1.16 oz (33 g)	1.52 oz (43 g) max.	

Ordering Information

Order Model #	SDCFXY-ZZ*		SDP3BX-YY	
Where X:	SDCF-03 CF Adapter (See Note 5)		I Industrial temp. Standard temp.	
YY:	SDCFB-XXX	SDCFJ-XXX	16 16.1 MB	512 512.5 MB
	8 8.0 MB	64 64.2 MB	32 32.1 MB	640 640.5 MB
	16 16.0 MB	128 128.4 MB	64 64.2 MB	896 896.5 MB
	32 32.1 MB	256 256.9 MB	128 128.4 MB	1024 1024.9 MB
	64 64.2 MB	512 512.4 MB	192 192.4 MB	1536 1536.4 MB
	128 128.4 MB	1024 1024.9 MB	256 256.9 MB	2048 2048.9 MB
	192 192.4 MB		384 384.5 MB	
	256 256.9 MB	SDCFH-XXX		
	384 384.4 MB	128 128.4 MB		
	512 512.4 MB	192 192.4 MB		
	1024 1024.9 MB	256 256.9 MB		
		384 384.4 MB		
		512 512.4 MB		

Specifications subject to change without notice

* Other versions available:

X–B: Standard

H: "Ultra" High-Speed

J: MLC/NAND

Y–I: Industrial Temperature

Note: Capacities may vary by product family. Consult your SanDisk Sales Representative for correct part number.

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.

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.

	2.5" FlashDrive		MultiMediaCard
Interface	IDE		MultiMediaCard or SPI
System Performance (Notes 1 & 2)			
Data Transfer Rate to/from Host	16.0 MB/sec burst		2.5 MB/sec burst
Power Requirements (Note 1)			
DC Input Voltage			
Commercial	3.3V ± 5%, 5V ± 10%		2.7V to 3.6V
Industrial	3.3V ± 5%, 5V ± 5%		N/A
Typical Power Dissipation (Notes 3 & 4)			
Sleep	200 µA (3.3V)	500 µA (5V)	100 µA
Read	35 mA RMS (3.3V)	50 mA RMS (5V)	<33 mA
Write	35 mA RMS (3.3V)	50 mA RMS (5V)	<35 mA
Environmental Specifications			
Temperature			
Operating Commercial	0–60°C		-25–85°C
Operating Industrial	-40–85°C		N/A
Non-Operating Commercial	-25–85°C		-40–85°C
Non-Operating Industrial	-50–100°C		N/A
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	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	100.2 ± 0.51 mm		32 mm ± 0.1 mm
Width	69.85 ± 0.51 mm		24 mm ± 0.08 mm
Thickness (Body)	9.6 ± 5.0 mm		1.4 mm ± 0.1 mm
Thickness (Removable Edge)	N/A		N/A
Weight	160 g. max.		1.5 g. max.
Ordering Information			
Order Model #	SD25B-YY-100-50		SDMB-YYY SDCF-03 CF Adapter (See Note 5)
Where X:	I Industrial temp. Standard temp.		
YY:	32 32.1 MB	512 512.5 MB	16 16.1 MB
	64 64.2 MB	640 640.5 MB	32 32.1 MB
	128 128.4 MB	896 896.5 MB	64 64.2 MB
	192 192.4 MB	1024 1024.9 MB	128 128.2 MB
	256 256.9 MB	1536 1536.4 MB	
	384 384.5 MB	2048 2048.9 MB	

Specifications subject to change without notice

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

Note 5: CF interface surface mount header and ejector may be ordered from JST. To order, call: 1-800-947-1110.

	Secure Digital (SD)	SmartMedia
Interface	SD or SPI	N/A

System Performance (Notes 1 & 2)

Data Transfer Rate to/from Host	2.5 MB/sec burst	N/A
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Power Requirements (Note 1)

DC Input Voltage		
Commercial	2.7V to 3.6V	2.7V to 3.6V
Industrial	N/A	N/A
Typical Power Dissipation (Notes 3 & 4)		
Sleep	100 μ A	100 μ A
Read	<33 mA	10 μ A typ.
Write	<35 mA	10 μ A typ.

Environmental Specifications

Temperature		
Operating Commercial	-25–85°C	0–55°C
Operating Industrial	N/A	N/A
Non-Operating Commercial	-40–85°C	-20–65°C
Non-Operating Industrial	N/A	N/A
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	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	N/A
Preventive Maintenance	None	None
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read	N/A

Physical Specifications

Length	32 mm \pm 0.1 mm	45 mm \pm 0.1 mm
Width	24 mm \pm 0.08 mm	37 mm \pm 0.1 mm
Thickness (Body)	2.1 mm \pm 0.1 mm	0.76 mm \pm 0.1 mm
Thickness (Removable Edge)	N/A	N/A
Weight	1.5 g. max.	1.8 g. typ.

Ordering Information

Order Model #	SDSDB-YYY	SDSM-YYY
YY:	8 8.0 MB	8 8 MB
	16 16.1 MB	16 16 MB
	32 32.1 MB	32 32 MB
	64 64.2 MB	64 64 MB
	128 128.2 MB	128 128 MB
	256 256.2 MB	

Specifications subject to change without notice

	TriFlash		NAND Flash	
Interface	MultiMediaCardNAND SD or SPI			
System Performance (Notes 1 & 2)				
Data Transfer Rate to/from Host	2.5 MB/sec burst		N/A	
Power Requirements (Note 1)				
DC Input Voltage				
Commercial	2.7V to 3.6V		2.7V to 3.6V	
Industrial	N/A		N/A	
Typical Power Dissipation (Notes 3 & 4)				
Sleep	150 µA max.		100 µA	
Read	<25 mA max.		10 mA typ.	
Write	<35 mA max.		10 mA typ.	
Environmental Specifications				
Temperature				
Operating Commercial	-25–85°C		0–70°C	
Operating Industrial	N/A		-40–85°C	
Non-Operating Commercial	-40–85°C		-55–150°C	
Non-Operating Industrial	N/A		-55–150°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	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		N/A	
Preventive Maintenance	None		None	
Data Reliability	<1 non-recoverable error in 10 ¹⁴ bits read		N/A	
Physical Specifications				
Length	18 mm (256 & 512 Mb) 12 mm (128 Mb)		20 mm ± 0.2 mm	
Width	12 mm (256 & 512 Mb) 10 mm (128 Mb)		12 mm ± 0.1 mm	
Thickness (Body)	1.1 mm max.		1.2 mm max.	
Thickness (Removable Edge)	N/A		N/A	
Weight	N/A		0.53 g. typ.	
Ordering Information				
Order Model #	SDAT1FAH-YYY	SDBT1FAH-YYY	SDUNFAH-64	SDTNFBH-1024
YY:	128 128.0 Mb	256 256.0 Mb 512 512.0 Mb	64 64.0 Mb	1024 1024.0 Mb
	SDAT2FAH-YYY	SDBT2FAH-YYY	SDTNFAH-XXX	SDTNFCH-1024
	128 128.0 Mb	256 256.0 Mb 512 512.0 Mb	128 128.0 Mb 256 256.0 Mb 512 512.0 Mb	1024 1024.0 Mb
				SDTNFDH-2048 2048 2048.0 Mb

*For Industrial versions add a "–I"

Specifications subject to change without notice

For the most current information on SanDisk products, please visit our website: <http://www.sandisk.com>



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