

## SanDisk Flash Data Storage

SanDisk SD™ and miniSD™  
Memory Cards

## High capacity and small size

meeting the storage needs of  
today's portable devices

The SanDisk SD and miniSD Memory Cards are ultra small flash memory cards designed for use in portable consumer electronic devices. Since the introduction of SD in 1999, the SD Card has rapidly become the storage medium of choice for many consumer electronics devices such as digital video camcorders, digital cameras, handheld computers, audio players and mobile phones. Easy to design in and guaranteed to be cross-compatible, the SD Card is displacing existing media technologies and fostering new applications. With over 600 members the SD Card Association now boasts the largest membership of any memory card association and is a testament to the overwhelming support of SD within the consumer electronics community.

In order to satisfy the stringent space requirements of the mobile phone market, the miniSD Memory Card specification was developed and adopted by the SD Card Association. The miniSD Card, a thumbnail-sized flash memory card, offers the best features of SD but in a smaller physical form factor. Now designers have the most flexibility in choosing a memory card solution that gives them the highest capacity or ultra small size in a standard that is widely supported by hundreds of leading companies.

**SanDisk** 



## SD Card

The SD Card is a flash memory storage device designed to provide high capacity memory in a small size. It includes a high performance interface and built-in security functions for the secure exchange of content between host devices and the card. To date, over 1000 products with slots for the card have been introduced. This number continues to increase as products such as digital cameras become smaller in size, taking advantage of the SD Card's convenient form factor and large storage capacity. SD Memory Cards are now available in capacities between 16 Megabytes and 1 Gigabyte. With these capacities, it now becomes possible to store full-length MPEG-4 videos and hundreds of motion JPEG video clips without requiring the use of multiple cards.



## miniSD Card

In order to meet the demands of the mobile phone market, a new product was developed—the miniSD Memory Card. This card offers all of the benefits of SD but in a much smaller size. New capabilities in 2.5G and 3G mobile phones including built-in digital still cameras, content downloading, and games are dramatically increasing the requirements for data storage and creating the need for removable storage. The miniSD Card meets this need by providing the functionality of a standard SD Card in the ultra small form factor required by mobile phones.

## High capacity and small size

	SD Card	miniSD Card <i>&gt;60% Smaller Volume!</i>
Dimensions	32 x 24 x 2.1 mm	21.5 x 20 x 1.4 mm
Card Footprint with Connector	768 mm <sup>2</sup> 980 mm <sup>2</sup>	430 mm <sup>2</sup> 547 mm <sup>2*</sup>
Card Volume with Connector	1,613 mm <sup>3</sup> 3,136 mm <sup>3</sup>	602 mm <sup>3</sup> 1,232 mm <sup>3*</sup>
Weight	2.0 Grams	1.0 Grams
Operating Voltage	2.7–3.6V	2.7–3.6V
Write Protect Switch	Yes	No
ESD	15kV	15kV
Capacity Points	16MB–1GB	16MB–256MB

*\*Estimate*

The two form factors provide designers with the maximum flexibility in having high capacity storage using SD or very small size using miniSD. The miniSD Card is over 60% smaller than an SD Card.

## Seamless interoperability to the SD world

The miniSD Card is electrically compatible with the existing SD standard and runs on the same bus. It uses the same SD interface, including security features for content protection (CPRM—Content Protection Rights Management), as the standard SD Card. As an extension of the existing SD Card standard, the miniSD Card allows mobile phone and consumer electronics developers to leverage their current SD-based designs with no changes to software or electronics. This also allows for very low cost adapters that convert the miniSD Card into the SD Card form factor. The adapter allows the miniSD Card to fit into existing SD Card slots, and thereby provide compatibility with the rapidly growing number of SD compatible devices in the market.



# SD and miniSD Cards specifications

	SD	miniSD
<b>INTERFACE</b>		
	SD or SPI	SD or SPI
<b>POWER</b>		
DC Input Voltage	2.7V to 3.6V	2.7V to 3.6V
Typical Power Dissipation		
Sleep	<250 $\mu$ A	<150 $\mu$ A
Read	<65 mA	<30 mA
Write	<75 mA	<40 mA
<b>ENVIRONMENTAL</b>		
Temperature		
Operating Commercial	-25-85 °C	-25-85 °C
Non-Operating Commercial	-40-85 °C	-40-85 °C
Humidity		
Operating	8-95% non-condensing	8-95% non-condensing
Non-Operating	8-95% non-condensing	8-95% non-condensing
Shock		
Operating	1,000 G max.	1,000 G max.
Non-Operating	1,000 G max	1,000 G max

	SD	miniSD
<b>RELIABILITY AND MAINTENANCE</b>		
MTBF ( <i>Mean Time Between Failures</i> )	>1,000,000 hours	>1,000,000 hours
Data Reliability	<1 non-recoverable error in 10 <sup>14</sup> bits read	<1 non-recoverable error in 10 <sup>14</sup> bits read
<b>PHYSICAL</b>		
Length	32 mm +/- 0.1 mm	21.5 mm +/- 0.1 mm
Width	24 mm +/- 0.08 mm	20.0 mm +/- 0.1 mm
Thickness (Body)	2.1mm +/- 0.1 mm	1.4 mm +/- 0.1 mm
Weight	2.0 g. max.	1.0 g. max
<b>ORDERING INFORMATION</b>		
Order Model #	SDSDB-YYY	SDSDM-YYY
YYY:	16 16.1 MB	16 16.1 MB
	32 32.1 MB	32 32.1 MB
	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	
	1024 1024.9 MB	

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