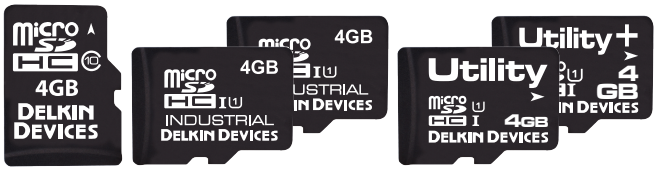
DELKIN DEVICES
Rugged Controlled Storage.

PRODUCT PORTFOLIO

microSD/SDHC/SDXC Cards



microSD cards have been mainstream for years as storage for mobile phones, action cameras and other consumer devices. More recently, the small, lightweight and rugged form factor has become one of the most popular storage media for industrial and OEM applications as well. For handheld devices and other real estate-constrained designs, across a wide range of applications including inventory management, telecommunications, medical devices, power and energy, infotainment and transportation, Delkin Devices offers a full menu of microSD cards, allowing the best product selection to match any use model. Delkin microSD products have many additional benefits over standard retail consumer-grade cards, including BOM control, life cycle management and outstanding applications support.

Whether the application calls for a few Megabytes of storage to launch an application, or several Gigabytes to store video data, Delkin has the solution.

For the most demanding applications, in terms of environmental conditions, write-intensive workload or the mission-critical nature of the stored data, Delkin offers true industrial SD controllers, high endurance SLC NAND flash, full industrial temperature range and long life cycles.

HIGHLIGHTS

Five microSD Product Families
- SLC and MLC Flash
- Commercial & Industrial Temp
- SD 3.0 & SD 2.0

Wide Range of Capacities from 128MB to 64GB

Support for SD and SPI Modes

Controlled BOM

Life Cycle Management

For more cost sensitive designs, Delkin offers lines of MLC-based cards – the Utility family in standard (-25°C to +85°C) and Utility+ family offering full industrial (-40°C to +85°C) temperature ranges.

Regardless of the microSD product family, Delkin ensures consistent performance and host compatibility through managed configurations. Delkin locks the card configuration down to the specific controller, firmware and flash chips, with a change to any of these components dictating a new part number. When an unavoidable EOL occurs to any of these items, Delkin communicates the discontinuation in advance, providing the opportunity to place a last time buy as well as to qualify the replacement solution.

Additionally, since the Delkin Devices facility in Poway, California is the headquarters for our design, manufacturing and support teams, we can also provide customized microSD solutions. Options include pad printing, content or image loading, conformal coating or other mechanical modifications to meet a specific need. Contact us to ask how a card can be customized for your application.

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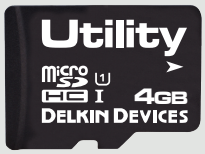
microSD/SDHC/SDXC CARD PRODUCT MATRIX



SD Product Family	U331 Series	U331A Series	U300 Series	Utility microSD	Utility+ microSD
Interface	SD 3.0, Class 10, UHS-I				
Connector	Standard microSD 8 pin				
Outline Dimensions	11 x 15 x 1 mm				
Flash Type	SLC			MLC	MLC
Density Range	128 MB – 2 GB (SD) 4 GB (SDHC)	128 MB – 2 GB (SD) 4 GB (SDHC)	512 MB - 2GB (SD) 4GB - 16GB (SDHC)	4 GB – 32 GB (SDHC) 64 -128GB(SDXC)	4 GB – 32 GB (SDHC) 64 – 128GB (SDXC)
Data Retention	10 years - up to 10% of P/E cycles			5 years - up to 10% of P/E cycles	
	1 year - at end of life / 100% of cycles			1 year - at end of life / 100% of cycles	
Endurance (Raw Flash Level)	50,000 P/E cycles		60,000 P/E cycles	3,000 P/E Cycles	
Operating Temperature	-40°C to +85°C		-40°C to +85°C	-25°C to +85°C	-40°C to +85°C
Storage Temperature	-40°C to +85°C		-50°C to +100°C	-40°C to +85°C	
Performance					
Sequential Read (MB/s)	up to 20	up to 22	up to 24	up to 95	
Sequential Write (MB/s)	up to 20	up to 22	up to 20	up to 90	
MTBF	≥ 2,000,000 hours (0 - 25°C)			≥ 3,000,000 hours (0 - 30°C)	
Shock*	1,500 G for 0.5msec				
Vibration*	20Hz ~80Hz/1.52mm displacement, 80Hz~2000Hz / 20G Acceleration				
Humidity	5 - 95% RH, non-condensing			95% RH under 40°C	
Voltage	2.7 – 3.6 V Normal				
Power Consumption	Read typically <50 mA Write typically < 100 mA Idle typically < 500 uA			Read typically <160 mA Write typically < 130 mA Idle typically < 300 uA	
Features & Tools	Proven Power Fail Safety Sophisticated Wear Leveling & Bad Block management Highest Endurance Longest Life Cycle			Robust Power Fail & Firmware Protection Sophisticated Wear Leveling & Bad Block management SMART Data Reporting & Dashboard Limited Life Cycle Management Cost Effective	
SMART Capability	CMD56, Libraries Available Delkin Dashboard (Windows)		CMD56, Emulation Dashboard Avail Q316	CMD56, Libraries Available Delkin Dashboard (Windows)	
Part Numbers	128MB S312TLK7B-C1000-3 256MB S325TLM7B-C1000-3 512MB S351TLN7B-C1000-3 1GB S30GTLN7B-C1000-3 2GB S302TLN7B-C1000-3 4GB S304TLN7B-U1000-3 All capacities include Embedded Mode to ensure efficient wear leveling regardless of operating system or file system used. Contact Delkin for other options	128MB S312TLKCN-C1000-3 256MB S325TLMCN-C1000-3 512MB S351TLNCN-C1000-3 1GB S30GTLNCN-C1000-3 2GB S302TLNCN-C1000-3 4GB S304TLNCN-U1000-3 All capacities include Embedded Mode to ensure efficient wear leveling regardless of operating system or file system used. Contact Delkin for other options	512MB S351MMVAL-C1000-4 1GB S30GMMUAL-C1000-4 2GB S302MMZAL-C1000-4 4GB S304MMZAL-U1000-4 8GB S308MMZAL-U1000-4 16GB S316MMZAL-U1000-4 Contact Delkin for other options	4GB S404APY5Q-U1000-3 8GB S408APG49-U1000-3 16GB S416APG49-U3000-3 32GB S432APG49-U3000-3 64GB S464APG5S-U3000-3 128GB S41HAPGAC-U3000-3 Contact Delkin for other options, including pSLC configurations	4GB S304APY5Q-U1000-3 8GB S308APG49-U1000-3 16GB S316APG49-U3000-3 32GB S332APG49-U3000-3 64GB S364APG5S-U3000-3 128GB S31HAPGAC-U3000-3 Contact Delkin for other options, including pSLC configurations

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