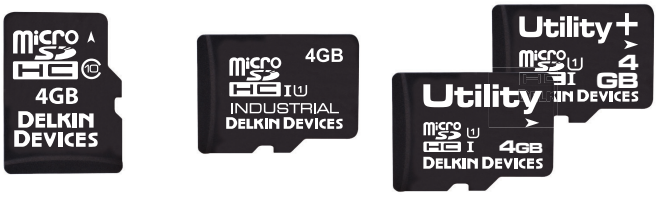
# DELKIN DEVICES
Rugged Controlled Storage.

## 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, light-weight 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, tele-communications, medical devices, power and energy, infotainment and transportation, Delkin Devices offers a full menu of microSD cards, allowing the best prod-uct 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

Four microSD Product Families
- SLC, MLC and 3D Flash
- Commercial & Industrial Temp
- SD 3.0

Wide Range of Capacities from 128MB to 128GB

Support for SD and SPI Modes

Controlled BOM

Life Cycle Management

For more cost sensitive designs, Delkin offers lines of MLC/3D Industrial - 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 communi-cates 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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www.delkin.com I 800.637.8087 I 858.391.1234

# microSD/SDHC/SDXC CARD Product Matrix





| SD Product Family | U331C 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 / 3D Industrial | |
| **Density Range** | 128 MB – 2 GB (SD)<br>4GB (SDHC) | 2GB (SD)<br>4GB - 8GB (SDHC) | 4GB – 32GB (SDHC)<br>64GB – 128GB (SDXC) | 4GB – 32GB (SDHC)<br>64GB – 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)** | 60,000 P/E cycles | | 3,000 P/E Cycles MLC<br>1,500 – 3,000 P/E Cycles 3D Industrial | |
| **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 22 | up to 29 | up to 95 | |
| **Sequential Write (MB/s)** | up to 22 | up to 20 | up to 90 | |
| **MTBF** | ≥ 2,000,000 hours (0 - 25°C) | | ≥ 3,000,000 hours (0 - 25°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<br>Write typically < 100 mA<br>Idle typically < 500 uA | | Read typically < 400 mA<br>Write typically < 400 mA<br>Idle typically < 1000 uA | |
| **Features & Tools** | Proven Power Fail Safety<br>Sophisticated Wear Leveling & Bad Block management<br>Highest Endurance<br>Longest Life Cycle | | Robust Power Fail & Firmware Protection<br>Sophisticated Wear Leveling & Bad Block management<br>SMART Data Reporting & Dashboard<br>Limited Life Cycle Management<br>Cost Effective | |
| **SMART Capability** | CMD56, Libraries Available<br>Delkin Dashboard (Windows) | CMD56, Emulation<br>Dashboard | CMD56, Libraries Available<br>Delkin Dashboard (Windows) | |
| **Part Numbers** | 128MB S312TLKJM-C1000-3<br>256MB S325TLMJM-C1000-3<br>512MB S351TLNJM-C1000-3<br>1GB S30GTLNJM-C1000-3<br>2GB S302TLNJM-C1000-3<br>4GB S304TLNJM-U1000-3<br>Contact Delkin for other options | 2GB S302MMZAL-C1000-D<br>4GB S304MMZAL-U1000-D<br>8GB S308MMZAL-U1000-D<br>All capacities include AES Encryption Engine. Contact Delkin for other options | 4GB S404APYJP-U1000-3<br>8GB S408APGJP-U1000-3<br>16GB S416APGJP-U3000-3<br>32GB S432FQYFA-U1000-3<br>64GB S464FQYFA-U1000-3<br>128GB S41HFQYFA-U1000-3<br>Contact Delkin for other options, including pSLC configurations | 4GB S304APYJP-U1000-3<br>8GB S308APGJP-U1000-3<br>16GB S316APGJP-U3000-3<br>32GB S332FQYFA-U1000-3<br>64GB S364FQYFA-U1000-3<br>128GB S31HFQYFA-U1000-3<br>Contact Delkin for other options, including pSLC configurations |



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