sparsh
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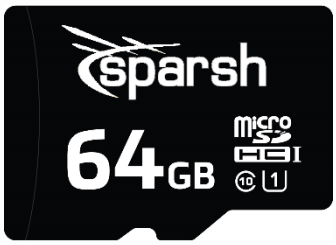
Trade Series

Micro SD Card



SPA-SD01-M

Key Feature

- FAT32 File System
- SD SPI mode compatible
- Class 10, UHS-I, A1, USH-I, U1/U3, Up to V30
- ECC Correction
- Static & Dynamic Wear Levelling
- Bad Block Management
- Advance Flash Management

Model	**SPA-SD01-M**
Flash Type	Toshiba 15nm Toshiba BiCS3/4 WD-SanDisk BiCS3 Hynix 3D-V4
Bus Speed	UHS 1
Speed Class	Class 10 A1 UHS-I U1/U3 Up to V30
Capacity	16/32/64/128/256GB
Write Protection	Mechanical Switch
Complaint Specifications	• Part 1 Physical Layer Specification Ver. 6.10 • Part 2 File System Specification Ver. 3.00 • Part 3 Security Specification Ver. 7.00 • Standard Size SD Card Mechanical Addendum Ver. 7.0
Copyrights Protection Mechanism	Part 1 Physical Layer Specification ver. 6.10 (Optional: CPRM)
Hot Plug	Support
Electrostatic Discharge (ESD)	Air: ± 8KV
Shock	500G Acceleration Force
Bending	≥10N Force
Durability	10,000 mating cycles
Height of Drop	150cm Free Fall
Power Supply	2.7 ~ 3.6V
Working Temperature & Humidity	Operation: -25°C ~ 85°C Storage: -40°C ~ 85°C
Power Consumption	Power Up Current < 250uA Standby Current < 1000uA Read Current < 400mA Write Current < 400mA

Bus Speed Mode (use 4 parallel data lines)

- **Non-UHS Mode**

1- Default speed mode: 3.3V signalling, frequency up to 25MHz, up to 12.5 MB/sec

2- High speed mode: 3.3V signalling, frequency up to 50MHz, up to 25 MB/sec

- **UHS Mode**

1- SDR12: SDR up to 25MHz, 1.8V signalling

2- SDR25: SDR up to 50MHz, 1.8V signalling

3- SDR50: 1.8V signalling, frequency up to 100MHz, up to 50 MB/sec

4- SDR104: 1.8V signalling, frequency up to 208MHz, up to 104MB/sec

Advance Flash Management:

Error Correction Code (ECC): Flash memory cells will deteriorate with use, which might generate random bit errors in the stored data. Thus, microSD card applies ECC Algorithm, which can detect and correct errors during Read processes, ensuring data is read correctly, as well as protecting data from corruption.

Wear Levelling: NAND Flash devices can only undergo a limited number of program/erase cycles, and in most cases, the flash media are not used evenly. If some area gets updated more frequently than others, the lifetime of the device would be reduced significantly. Thus, Wear Levelling technique is applied to extend the lifespan of NAND Flash by evenly distributing write and erase cycles across the media. Sparsh provides advanced Wear Levelling algorithm, which can efficiently spread out the flash usage through the whole flash media area. Moreover, by implementing both dynamic and static Wear Levelling algorithms, the life expectancy of the NAND Flash is greatly improved.

Bad Block Management: Bad blocks are blocks that include one or more invalid bits, and their reliability is not guaranteed. Blocks that are identified and marked as bad by the manufacturer are referred to as “Initial Bad Blocks”. Bad blocks that SG microSD Card (UHS-I) 2 are developed during the lifespan of the flash are named “Later Bad Blocks”. Sparsh implements an efficient bad block management algorithm to detect the factory-produced bad blocks and manages any bad blocks that appear with use. This practice further prevents data being stored into bad blocks and improves the data reliability