swissbit®

Product Fact Sheet

# Industrial microSDHC / SDXC Memory Card

## S-56u High reliability series

UHS-I Interface, 3D pSLC-mode

Extended and Industrial Temperature Grade

Date: May 08, 2023
Revision: 1.05




Made in Germany

# Product Summary

- **Capacities:** 4 GBytes, 8 GBytes, 16 GBytes, 32 GBytes, 64 GBytes, 128 GBytes
- **Form Factor:** Standard microSD Memory card form factor – 15.0mm x 11.0mm x 0.7mm (1.0mm)
- **Compliance[1]:** Fully compliant with SD Memory Card specification 6.10
  - SDHC high speed mode, UHS-I
  - Speed class 10/U3/V30/A2 according SD6.10 specification
  - SD2.0 backward compliant
  - FAT32 / exFAT preformatted
- **Environmental:** RoHS / REACH Compliant
- **Compatibility:** Support SD SPI mode
- **Performance:**
  - Read performance: sequential read up to 95 MBytes/s
  - Write performance: sequential write up to 83 MBytes/s
  - SDR12, SDR25, SDR50, SDR104, DDR50 mode
- **Operating Temperature Range[2]:**
  - Extended: -25 °C to 85 °C
  - Industrial: -40 °C to 85 °C
- **Storage Temperature Range:**
  - Extended: -25 °C to 100 °C
  - Industrial: -40 °C to 100 °C
- **Operating Voltage:** 2.7...3.6V
- **Data Retention[3]:** 10 years @ life begin; 1 year @ life end
- **Error Correction:** Advanced ECC (Error Correction Code)
  - Mean Time Between Failure (MTBF): > 3,000,000 hours

# Product Features

- High performance 6.10 specification
  - SD burst up to 104MB/s
  - SD Normal speed 0...25MHz clock rate
  - SD High speed 25...50MHz clock rate
  - SD UHS-I speed 0...50MHz (DDR) and 0...208MHz (SDR)
- Power Supply: (Low-power CMOS technology)
  - 2.7...3.6V normal operating voltage
- Optimized FW algorithms especially for read/write access, highest random write performance and best endurance with long data retention.
  - Designed for usage in applications with highest requirements regarding reliability like data logging, POS/POI, Medical and other demanding use-cases.
  - Especially suitable for intensive read/write operations
  - Advanced power-off reliability technology
  - Wear Leveling technology
    Equal wear leveling of static and dynamic data. The wear leveling assures that dynamic data as well as static data is balanced evenly across the memory. With that the maximum write endurance of the device is guaranteed

[1] The verification of host system and storage device compatibility is in customer's responsibility. Swissbit can provide guidance and support on request.
[2] @Ambient temperature
[3] NAND Flash data retention and endurance characteristics are defined according to JEDEC JESD47 and JESD22. The endurance limits of the storage shall be monitored by the life time information and simulated before field usage by the customer.

  - The S-56u High Reliability Series is optimized for high read/write traffic for demanding industrial applications. The series is especially developed for high random write performance and best endurance.
  - Read Disturb Management
    The read commands are monitored and the content is refreshed when critical levels have occurred
  - Data Care Management
    The interruptible background process maintain the user data for Read Disturb effects or Retention degradation due to high temperature effects
  - Near miss ECC technology
    Minimize the risk of uncorrectable bit failure over the product life time. Each read command analyzes the ECC margin level and refresh data if necessary
  - Diagnostic features with Life Time Monitoring tool support
- High reliability
  - The product is optimized for long life cycle that requires superior data retention because of high temperature mission profile
  - FW is designed to ensure highest reliability at lowest possible DPPM rates
  - Number of card insertions/removals up to 20,000
  - Industrial Temperature range -40° up to 85°C inclusive full cross temperature support
  - SIP (System In Package) process for extreme dust, water and ESD proof
- Controlled BOM & PCN process
- Controlled "Locked" BOM & PCN process
- Customized options like CID registers, CPRM keys, firmware incl. settings and marking on request
- Manufactured in a TS 16949 certified factory
- In-field firmware update[4]
- Swissbit Life Time Monitoring (SBLTM) Tool and SDK for SBLTM (on request)

## Why Swissbit?

Swissbit is focused on the design, development, manufacture, and support of leading edge memory and storage solutions for the worldwide OEM/ODM marketplace. As a global supplier, Swissbit recognizes and addressees the higher level of application requirements of today's industrial, Netcom, and automotive customers by providing best-in-class products and services, with uncompromised attention to driving overall value and quality.

[4] The support of In-Field FW update capabilities on host systems is recommended.