swissbit®

Product Fact Sheet

Industrial
MICRO SD/SDHC Memory Card

S-450u Series
UHS-I Interface, SLC



made in germany

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

S-450u Series (UHS-I, SLC)

Industrial MICRO SD/SDHC Memory Card – 512MB to 8GByte

Main Feature



- Fully compliant with SD Memory Card specification 3.0 and MICRO SD Memory Card Addendum 4.00
  - SD ultra high speed mode, speed class 1 (SDR104)
  - SD high speed mode, up to speed class 10
  - SD2.0 SDHC backward compliant, default speed and high speed mode
  - FAT32 preformatted
- High performance 3.0 specification
  - SD burst up to 104MB/s
  - SD Normal speed 0...25MHz clock rate
  - SD High speed 0...50MHz clock rate
  - SD UHS-I speed 0...50MHz (DDR) and 0...208MHz (SDR)
  - Up to 24MByte/s sequential data rate
- Power Supply: (Low-power CMOS technology)
  - 2.7...3.6V operating voltage
- Standard MICRO SD Memory Card form factor
  - 15.0mm x 11.0mm x 0.7mm(1.0mm)
- Optimized FW algorithms especially for high read access and long data retention applications
  - Patented 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
  - Write Endurance technology
    Due to intelligent wear leveling an even use of the entire flash is guaranteed, regardless how much "static" (OS) data is stored.
  - 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
  - SLC Flash
  - Designed for industrial market especially read intensive application like navigation, infotainment, POS/POI, medical and general boot medium use case
  - The product is optimized for long life cycle that requires good data retention because of high temperature mission profile.
  - For less write and performance critical applications S-4x the more cost efficient S-4xu series MLC cards could be used
  - Number of card insertions/removals up to 20,000
  - Extended and Industrial Temperature range -25° up to 85°C and -40° up to 85°C
  - SIP (System In Package) process for extreme dust, water and ESD proof
  - Selected AEC-Q100 qualification
- Controlled BOM & PCN process
- Manufactured in a TS 16949 certified factory
- Customized options like CID registers, CPRM keys, firmware incl. settings and marking by projects

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Order Information for S-450 Series UHS-I MICRO SD Memory Cards

Density	Part Number	Temp. Range	Flash Technology
512MB	SFSD0512NgBM1TO-t-ME-2xx-STD	t = E -25°C to 85°C t = I -40°C to 85°C	SLC NAND Flash
1GB	SFSD1024NgBM1TO-t-DF-2xx-STD		
2GB	SFSD2048NgBM1MT-t-ME-2xx-STD		
4GB	SFSD4096NgBM1MT-t-DF-2xx-STD		
8GB	SFSD8192NgBM1MT-t-QG-2xx-STD		

g = generation; x = options, firmware and custom configuration

System Performance

System Performance (estimated target)	typ	max	Unit
Burst Data transfer Rate (max clock 208MHz SDR)		104	MB/s
Sustained Sequential Read (512M / 1G-8G)	26 / 27	30 / 30	
Sustained Sequential Write (512M / 1G / 2G / 4G / 8G)	17 / 20 / 17 / 20 / 20	20 / 24 / 20 / 24 / 24	

Current Consumption @3.3V	Typ	max	Unit
Write	60	80	mA
Read	50	80	
Autoread	40	60	
Idle	1.4	3	

Physical Dimensions

Physical Dimensions	Value	Unit
Length	15.0±0.1	mm
Width	11.0±0.1	
Thickness	0.7 (1.0)±0.1	
Weight (typ.)	0.4	g

Recommended Temperature Conditions

Parameter	min	typ	max	Unit
Extended Operating Temperature	-25	25	85*)	°C
Industrial Operating Temperature	-40	25	85*)	°C
Storage Temperature	-40	25	100*)	°C

*) high temperature storage without operation reduces the data retention, in operation the data will be refreshed, if data error issues were detected

Humidity and EMC

Parameter	Operating	Non Operating
Humidity (non-condensing)	max 95%	
ESD	**Non Contact Pads area:** ±15 kV (air discharge), according to IEC61000-4-2	**Contact Pads:** ±6 kV, according to IEC61000-4-2 **Non Contact Pads area:** ±8kV (indirect) contact discharge, according to IEC61000-4-2

Durability

Parameter	Operating	Non Operating
Salt water spray	3% NaCl/35°C; 24h acc. MIL STD Method 1009	
Insertions / Drop test	>10,000/ 1.5m free fall	
Bending / Torque / Bump	10N / 0.15Nm or ±2.5deg / 25g; 6ms; ±3 x 4000 shocks	
Shock / Vibration (peak -to-peak)	1000 g max. / 15G max.	
Data Retention initial @ 40°C	10 years	

For more information on Micro SD Memory card Specification, please visit SD association (www.sdcard.org)

Why Swissbit?

Swissbit strives to create innovative technologies for future market opportunities utilizing a highly skilled in-house product research and development team. Swissbit maintains a marketing edge by continuing to manufacture world-class high quality memory products and providing customers with both high value and low cost of ownership achieved through efficient processes and procedures.

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