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Product Fact Sheet

Industrial
MICRO SDHC Memory Card

S-45u Series
UHS-I Interface

made in germany
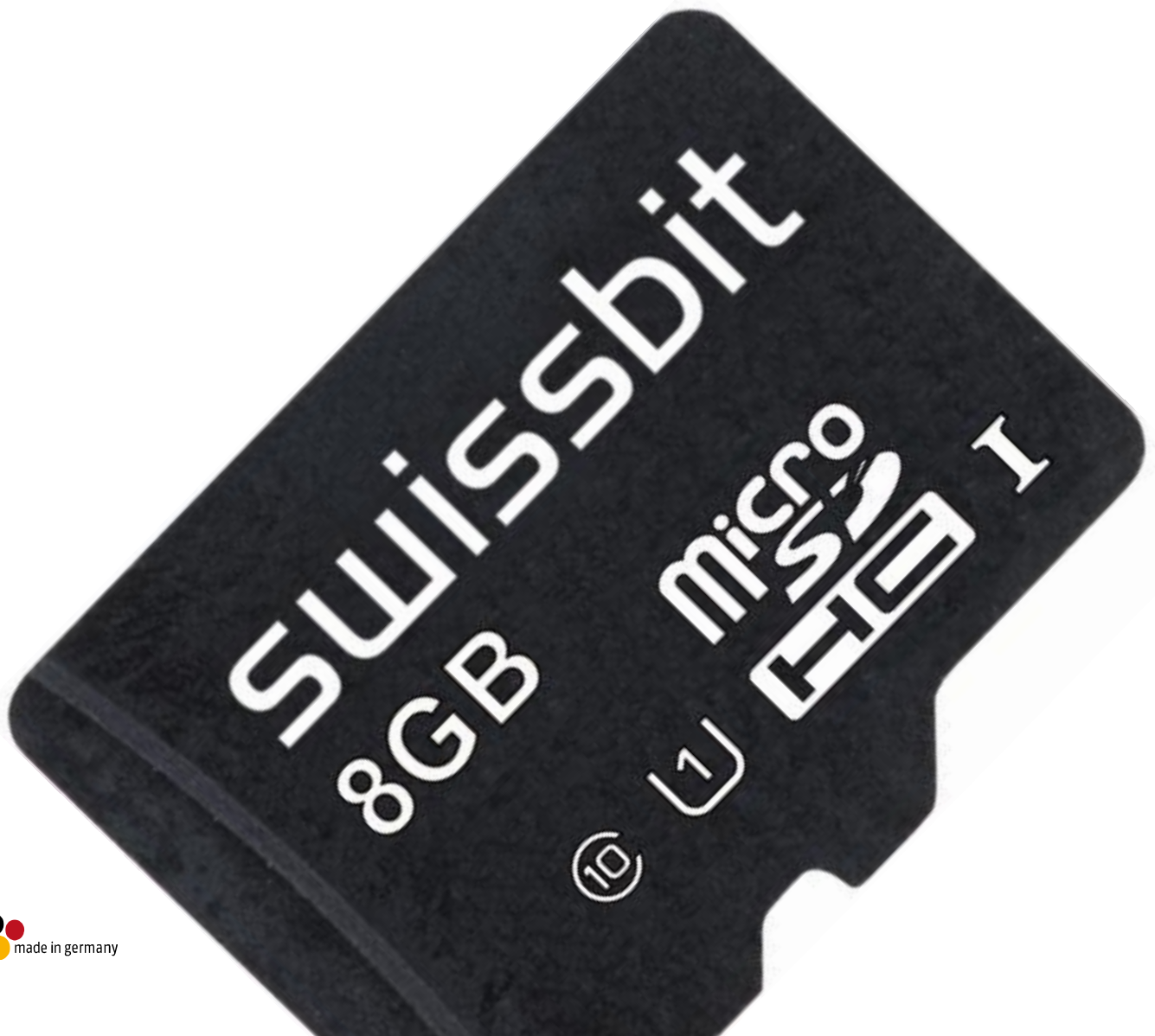
S-45u Series
Industrial MICRO SDHC Memory Card – 4/8/16/32 GByte MLC

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Main Features

- Fully compliant with SD Memory Card specification 2.0 and 3.0 and MICRO SD Memory Card Addendum 4.00
  - SDHC default/high speed mode and UHS supported
  - Up to speed class 10 and U1 according SD3.0 specification
  - FAT32 preformatted

- High performance 3.0 specification
  - UHS-I speed   0...100MHz (SDR50), 0...50MHz (DDR50)
  - SD High speed   0...50MHz
  - SD Default speed   0...25MHz
  - Up to 33Byte/s sequential data rate
  - durabit firmware optimized for random write performance, up to 640 write IOPs (4kB)

- Power Supply: (Low-power CMOS technology)
  - 2.7...3.6V normal 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
  - 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.
  - Intensive write application should use the S-450u series cards
  - 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, respectively
  - SIP (System In Package) process for extreme dust, water and ESD proof

- Controlled BOM & PCN process

- Customized options like CID registers, CPRM keys, firmware incl. settings and marking by projects

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Order Information for S-45 Series UHS-I MICRO SDHC Memory Cards

Density	Part Number	Temp. Range	Flash Technology
4GB	SFSD4096NgBM1TO-t-xx-2f1-STD	t=E -25°C to 85°C t=I -40°C to 85°C	MLC NAND Flash
8GB	SFSD8192NgBM1TO-t-xx-2f1-STD		
16GB	SFSD016GNgBM1TO-t-xx-2f1-STD		
32GB	SFSD032GNgBM1TO-t-xx-2f1-STD		

g = 2, 3 generation; xx flash configuration, depending on generation, f = A, B, ...firmware

System Performance

System Performance	typ	max	Unit
Burst Data transfer Rate (max SD clock100MHz)		50	MB/s
Sequential / Random Read(4k)	33 / 2.8	40 / 3.8	
Sequential /Random Write(4k)	12-14 / 2.9-3.3	19 / 3.5	

Current Consumption @3.3V @25°C	typ	max	Unit
Write	60	80	mA
Read	50	80	
Idle	5	12	

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	
Solar Exposure / Impermeability	1000W/m2 @ 400°C / IP67	
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 at beginning @ 40°C	10 years *)	

*) After every power on, the card reads the whole flash and performs a data refresh, if necessary. So the data retention can be much longer in most use cases.

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 sand providing customers with both high value and low cost of ownership achieved through efficient processes and procedures.

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