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Product fact sheet

Industrial Slim-SATA SSD M0-297A

X-200s Series
SATA II – 3.0Gb/s
up to UDMA6 / MDMA2 / PIO4

Standard and industrial temperature grade

BU: Swissbit Group
Date: 17 August 2011
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X-200s Series – Industrial Slim-SATA Solid State Drive
2GByte up to 32GByte (MO-297A)

Feature summary

- Form factor:
    - Full-sized mSATA form factor
    - JEDEC MO-297A sized Solid State Drive (SSD)
    - 54mm x 39mm x 4mm
    - 7+15 pin (SATA+power) SATA connector
    - Replacement of a standard SATA-compliant HDD
- Interface:
    - SATA Rev 2.6 – 3Gbit/s (1.5Gbit/s compatible)
- Highly-integrated memory controller
    - max. UDMA6 supported
    - max. PIO mode 4, MDMA2 supported
    - SLC NAND Flash
    - Hardware BCH-code ECC (8 Bit correction per sector for SLC)
    - fix drive configuration
- Low-power CMOS technology
- 5.0V ± 10% power supply (3.3V optional)
- Low Power, less than 500mA
- optional activity LED, write protect and Quick erase switch on request
- No mechanical noise
- Wear Leveling: active 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.
- High reliability
    - MTBF > 2,500,000 hours
    - Data reliability: < 1 non-recoverable error per 10^{14} bits read
    - Number of connector insertions/removals: >1,000
- High performance
    - Up to 300MB/s burst transfer rate in SATA II – 3.0Gb/sec
    - Sustained Write performance: up to 95MB/s
    - Sustained Read Performance: up to 120MB/s
- Available densities
    - 2GByte up to 32GByte (SLC NAND Flash)
- S.M.A.R.T., HPA, Security and 48bit feature set
- 2 Temperature ranges
    - Commercial Temperature range   0 ... +70°C
    - Industrial Temperature range   -40 ... +85°C
- Life Cycle Management
- Controlled BOM
- RoHS compatible

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Pin out

The SLIM SATA connector is a standard SATA 7+15pin connector.
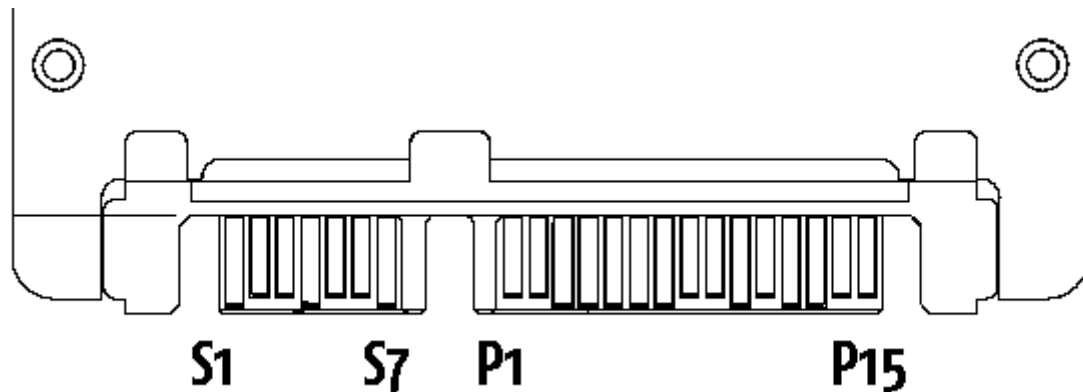
Table 1: Pin Assignment, name, and description

Pin	Signal Name	Description
S1	Ground	Signal Ground
S2	A+	+ Differential Receive signal
S3	A-	- Differential Receive signal
S4	Ground	Signal Ground
S5	B-	- Differential Transmit signal
S6	B+	+ Differential Transmit signal
S7	Ground	Signal Ground
P1...P3	3.3V	3.3V power (optional on request)
P4...P6	Ground	Power Ground
P7	5V	5V precharge
P8...P9	5V	5V power
P10	Ground	Power Ground
P11	Device activity	DA / LED (optional NC on request)
P12	Ground	Power Ground
P13...P15	12V	12V power (not used)

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Table 2: System Performance

System Performance	2GB	4GB	8...32GB	Unit
Data transfer Rate (SATA burst)	3.0 (1.5)	3.0 (1.5)	3.0 (1.5)	Gbit/s
Sustained Read (max. measured)	~60	~110	~120	MB/s
Sustained Write (max. measured)	~26	~47	~95	

1. All values refer to modules with 4x Toshiba Flash in UDMA mode 5, SATA 3.0Gbit/s, write/read data sequential 256 Sectors/Transfer command.
2. Sustained speed depends on flash type and number, file size, and burst speed

Table 3: Current consumption[1] at 5V ± 10%

Current Consumption	typical	max	Unit
Write (UDMA6)	350	400	mA
Read (UDMA6)	250	350	
Standby	125	140	

1. All values are typical at 25° C and nominal supply voltage and refer to 16GByte SSD module.

Table 4: Environmental Specifications

Environmental Specifications	Operating	Non Operating
Temperature (commercial)	0 to 70°C	−50 to 100°C
Temperature (industrial)	−40 to 85°C	−50 to 100°C
Humidity (non-condensing)	85% RH, at 85°C	max. 95% RH, at 85°C
Vibration (peak -to-peak)	20G Peak, 10...2000Hz	
Shock	1500G, 0.5ms duration, half sine wave	

Table 5: Physical Dimensions

Physical Dimensions		Unit
Width	54.0	mm
Height	39.8 (with connector)	
Thickness max.	4 (connector)	
Weight (typ.)	10	g

Table 6: SSD capacity specification

Capacity	Default_cylinders	Default_heads	Default_sectors_track	Sectors_drive	Total addressable capacity (Byte)
4GB	7,814	16	63	7,876,512	4,032,774,144
8GB	15,628	16	63	15,753,024	8,065,548,288
16GB	16,383*)	16	63	31,506,432	16,131,293,184
32GB	16,383*)	16	63	62,586,880	32,044,482,560

*) The CHS addressing is limited to about 8GB. Larger drives should be used in LBA mode.

Table 7: System Reliability and Maintenance

MTBF (at 25°C)	> 2,500,000 hours
Data Reliability	< 1 Non-Recoverable Error per 10^{14} bits Read

(1) Dependent on final system qualification data.

For more information on MO-297A mechanical standard, please visit JEDEC at www.jedec.org.

For more information on Serial ATA Revision 2.6, please visit Serial ATA International Organization at www.serialata.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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