

Product fact sheet

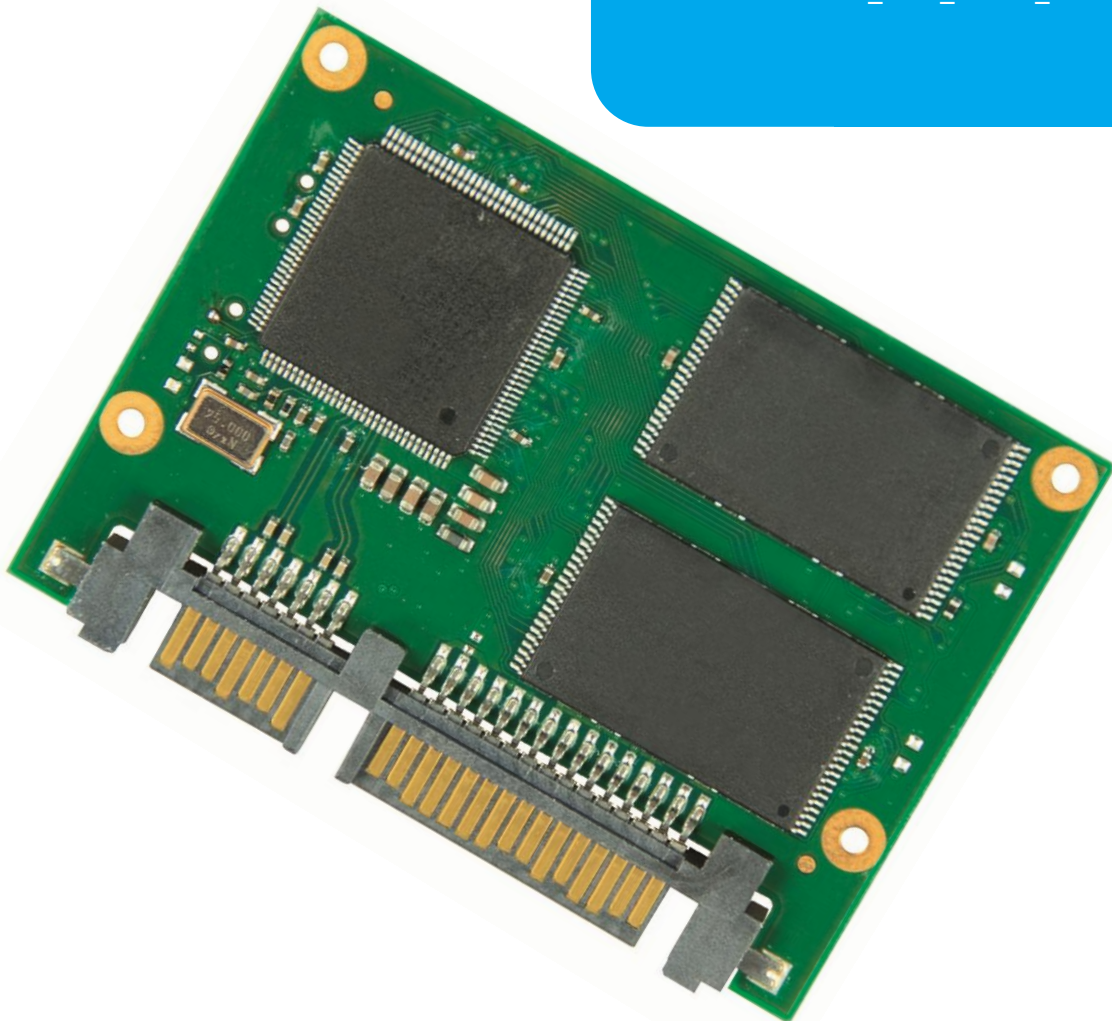
# Industrial Slim-SATA SSD M0-297

## X-200s Series

SATA II – 3.0Gb/s  
up to UDMA6 / MDMA2 / PIO4

Standard and industrial  
temperature grade

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# X-200s SERIES – INDUSTRIAL SLIM-SATA SOLID STATE DRIVE 2GBYTE UP TO 64GBYTE (M0-297)

## Feature summary

- Form factor:
  - Full-sized mSATA form factor
  - JEDEC M0-297 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, Quick erase switch and conformal coating 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<sup>14</sup> 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 64GByte (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



## Pin out

The SLIM SATA connector is a standard SATA 7+15pin connector.

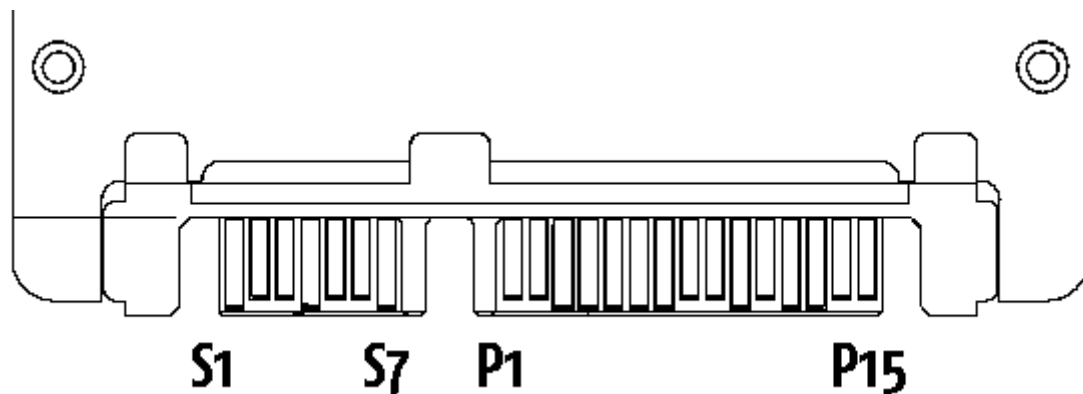


Table 1: Pin Assignment, name, and description

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)

**Table 2: System Performance**

System Performance	2GB	4GB	8...32GB	64GB	Unit
Data transfer Rate (SATA burst)	3.0 (1.5)				Gbit/s
Sustained Read (max. measured)	~60	~110	~120	~110	MB/s
Sustained Write (max. measured)	~26	~47	~95	~94	

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

**Table 3: Current consumption<sup>(1)</sup> at 5V ± 10%**

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

- 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
Height	39.8 (with connector)
Thickness max.	4 (connector)
Weight (typ.)	7

**Table 6: SSD capacity specification**

Capacity	Default_cylinders	Default_heads	Default_sectors	Sectors_drive	Total addressable Bytes
2GB	3,886	16	63	3,896,928	1,995,227,136
4GB	7,732	16	63	7,793,856	3,990,454,272
8GB	15,498	16	63	15,621,984	7,998,455,808
16GB	16,383*)	16	63	31,277,056	16,013,852,672
32GB	16,383*)	16	63	62,586,880	32,044,482,560
64GB	16383*)	16	63	125'313'024	64'160'268'288

\*) 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 <sup>14</sup> bits Read

(1) Dependent on final system qualification data.

For more information on M0-297 mechanical standard, please visit JEDEC at [www.jedec.org](http://www.jedec.org).

For more information on Serial ATA Revision 2.6, please visit Serial ATA International Organization at [www.serialata.org](http://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.