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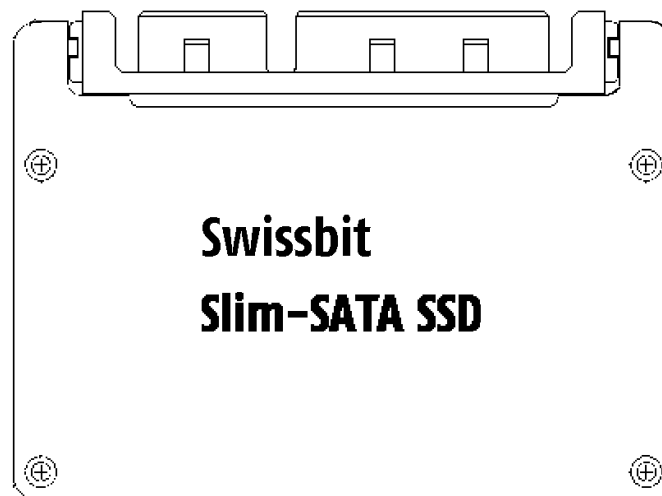
Product fact sheet

**Industrial
SLIM SATA SSD**
M0-297A

X-200s Series

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

BU: Swissbit Group
Date: 15 February 2011
Revision: 0.80 preliminary
X-200s_fact_sheet_SA-VxBR_Rev080.doc



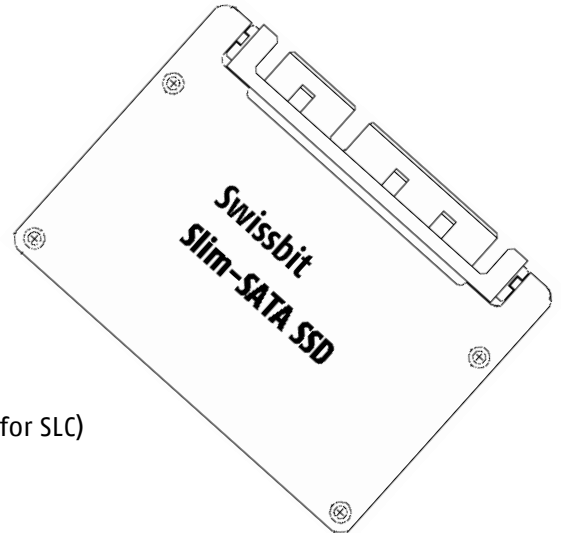
X-200s Solid State Drive

Industrial SLIM SATA SSD (M0-297A)

2GByte up to 32GByte

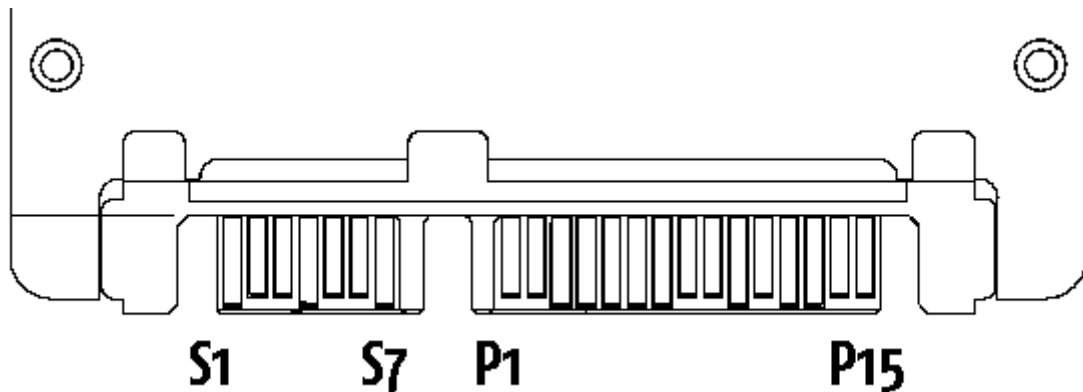
Feature summary

- Form factor:
 - Jedec M0-297A sized Solid State Drive (SSD)
 - 54mm x 39mm x 4mm
- Interface:
 - SATA Rev 2.6 – 3Gbit/s (1.5Gbit/s compatible)
 - 7+15pin (SATA+power)
 - standard 2.5" SATA-connector
- 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
- 5V ± 10% power supply
- optional 3.3V± 5% power supply
- Low Power, less than 500mA
- No mechanical noise
- Activity LED output (P11) (optional can be NC on the module)
- 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.
- Write endurance: Due to intelligent wear leveling an even use of the entire flash is guaranteed, regardless how much "static" (OS) data is stored.
Example: If the average file size is 10MByte and the total capacity is 8GByte, 80Mio write cycles can be performed.
- Data Retention: 10 years @ 10% life time
- High reliability
 - MTBF > 2,500,000 hours
 - Data reliability: < 1 non-recoverable error per 10¹⁴ bits read
- High performance
 - Up to 300MB/s burst transfer rate in SATA II – 3.0Gb/sec
 - Sustained Write performance: up to 90MB/s
 - Sustained Read Performance: up to 105MB/s
- Available densities
 - 4GByte up to 32GByte (SLC NAND Flash)
- Temperature ranges
 - Commercial Temperature range 0 ... +70°C
 - Industrial Temperature range -40 ... +85°C
- Controlled BOM
- RoHS compatible



Pinout

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



Pin	Assignment	Description
S1	GND	Signal ground
S2	A+	+ SATA differential receive signal
S3	A-	- SATA differential receive signal
S4	GND	Signal ground
S5	B-	- SATA differential transmit signal
S6	B+	+ SATA differential transmit signal
S7	GND	Signal ground
P1-P3	+3.3V	Optional 3.3V power supply *)
P4-P6	GND	Power Ground
P7-P9	+5V	Standard 5V power supply *)
P10	GND	Power Ground
P11	DA	Device activity / LED (optional)**)
P12	GND	Power Ground
P13-P15	+12V	No Connect

*) Standard modules have only 5V power supply
optional the modules can be ordered with 3.3V supply

***) Device Activity Pin is low in idle mode and high (flickering) during data transfer.
It can be optional disconnected on the module on request.

Table 1: System Performance

System Performance	4GB	8...32GB	Unit
Data transfer Rate (SATA burst)	3.0 (1.5)	3.0 (1.5)	Gbit/s
Sustained Read (max. measured)	115	110	MB/s
Sustained Write (max. measured)	45	90	

- 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.
- Sustained speed depends on flash type and number, file size, and burst speed

Table 2: Current consumption⁽¹⁾ 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 3: Environmental Specifications

Environmental Specifications	Operating	Non Operating
Temperature (commercial)	0 to 70°C	-40 to 85°C
Temperature (industrial)	-40 to 85°C	-50 to 95°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 4: Physical Dimensions

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

Table 5: 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 6: 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 M0-297A 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

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