

OVERVIEW

The SiliconDrive II USB 10-pin module is designed to meet the low power and small size requirements of embedded systems.

SiliconDrive II technology is engineered exclusively for the high performance, high reliability and multi-year product lifecycle requirements of the Enterprise System OEM market. Typical end-market applications include broadband data and voice networks, military systems, flight system avionics, medical equipment, industrial control systems, video surveillance, storage networking, VoIP, wireless infrastructure, and interactive kiosks.

Every SiliconDrive II USB 10-pin module is integrated with SiliconSystems patented PowerArmor and patent-pending SiSMART and SiSecure technologies.

PowerArmor prevents data corruption and loss from power disturbances by integrating patented technology into every SiliconDrive II.

SiSMART acts as an early warning system to eliminate unscheduled downtime by constantly monitoring and reporting the exact amount of remaining storage system useful life.

SiSecure is a comprehensive suite of user-selectable security technologies that solves the critical need for robust storage security for embedded systems applications that have a small footprint and low-power requirement.

SiSECURE

- | | |
|-----------|---|
| SiZone | Data zones with different security parameters. |
| SiKey | Ties SiliconDrive to a specific host and/or software IP. |
| SiProtect | Protection software for password-required, read/write, or read-only access. |
| SiSweep | Ultra-fast data erasure. |
| SiPurge | Non-recoverable data erasure. |
| AutoLock | Automatically locks the SiliconDrive. |

FEATURES

- RoHS 6 of 6 compliant
- Integrated PowerArmor, SiSMART, and SiSecure technology
- Capacity range: 1GB to 4GB
- MTBF >4,000,000 hours
- 2mm connector pin pitch



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REVISION HISTORY

Document No.	Release Date	Changes
4001MU-12DSR	June 12, 2008	Updated: <ul style="list-style-type: none"> • "Physical Dimensions" figure. • "2x5 Connector Pinout (Bottom View)" figure.
4001MU-11DSR	May 29, 2008	Updated: <ul style="list-style-type: none"> • "SiSecure." • "Features." • "Standard On-Board USB Header" to "Standard USB Header." • "System Power Requirements" table. • "Absolute Maximum Ratings" table. • "DC Characteristics" table. • "Part Numbering Nomenclature" table. Removed: <ul style="list-style-type: none"> • "DC Characteristics for Full-Speed Operation" table.
4001MU-10DSR	May 7, 2008	Updated: <ul style="list-style-type: none"> • "Overview." • "System Performance" table. • "System Power Requirements" table. Removed: <ul style="list-style-type: none"> • "Product Capacity Specifications." • "Impedance."
SSDS09-4001MU-R PRELIMINARY	April 3, 2008	<ul style="list-style-type: none"> • Updated the part pictures. • Removed "Pin Locations."
SSDS08-4001MU-R PRELIMINARY	March 20, 2008	Updated: <ul style="list-style-type: none"> • "Overview." • "Features." • SiProtect in the "SiSecure" and "Related Documentation" tables. Added: <ul style="list-style-type: none"> • SiSecure verbiage. • "MTBF." Removed: <ul style="list-style-type: none"> • SiSecure rows from the "SiSecure" and "Related Documentation" tables. • "System Reliability."

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Document No.	Release Date	Changes
SSDS07-4001MU-R PRELIMINARY	February 8, 2008	<p>Updated:</p> <ul style="list-style-type: none"> • Documents' title. • Connector pin pitch to 2mm. <p>Added:</p> <ul style="list-style-type: none"> • "SiliconDrive II Secure" to the cover, which includes AutoLock. <p>Removed:</p> <ul style="list-style-type: none"> • Reset to Ready Startup Time from the "System Performance" table.
SSDS06-4001MU-R PRELIMINARY	November 20, 2007	Updated the Cover page.
SSDS05-4001MU-R PRELIMINARY	November 15, 2007	<p>Updated:</p> <ul style="list-style-type: none"> • RoHS information. • "Features." • "Physical Dimensions" figure. • "System Performance" table. • "System Power Requirements" table. • "Product Capacity Specifications" table. • The DC Input Voltage in the "System Power Requirements" table. • "DC Characteristics." • "Part Numbering Nomenclature" table. • "Sample Label." <p>Added:</p> <ul style="list-style-type: none"> • 10-pin information. • SiliconDrive Secure information. • "Impedance" table. <p>Deleted:</p> <ul style="list-style-type: none"> • Cover picture. • "Absolute Maximum Ratings." • "Capacitance" table.
SSDS04-4001MU-R PRELIMINARY	June 20, 2007	Removed pins 41–43 from the "Signal Descriptions" table.
SSDS03-4001MU-R PRELIMINARY	May 22, 2007	<ul style="list-style-type: none"> • Added the "Physical Dimensions" figure. • Updated the "Switch Settings" figure.
SSDS02-4001MU-R PRELIMINARY	April 10, 2007	Updated the capacity range.

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Document No.	Release Date	Changes
SSDS01-4001MU-R PRELIMINARY	February 13, 2007	Updated the V_{IH} symbol from 2.0 to 2.5 in the following tables: <ul style="list-style-type: none">• "DC Characteristics for Full-Speed Operation (TA = 25°C, VDD = 3.3v, VSS = 0V) USB Signals" table.• "DC Characteristics for High-Speed Operation (TA = 25°C, VDD = 3.3v, VSS = 0V) USB Signals" table.
SSDS00-4001MU-R PRELIMINARY	January 9, 2007	Initial release.

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PHYSICAL SPECIFICATIONS

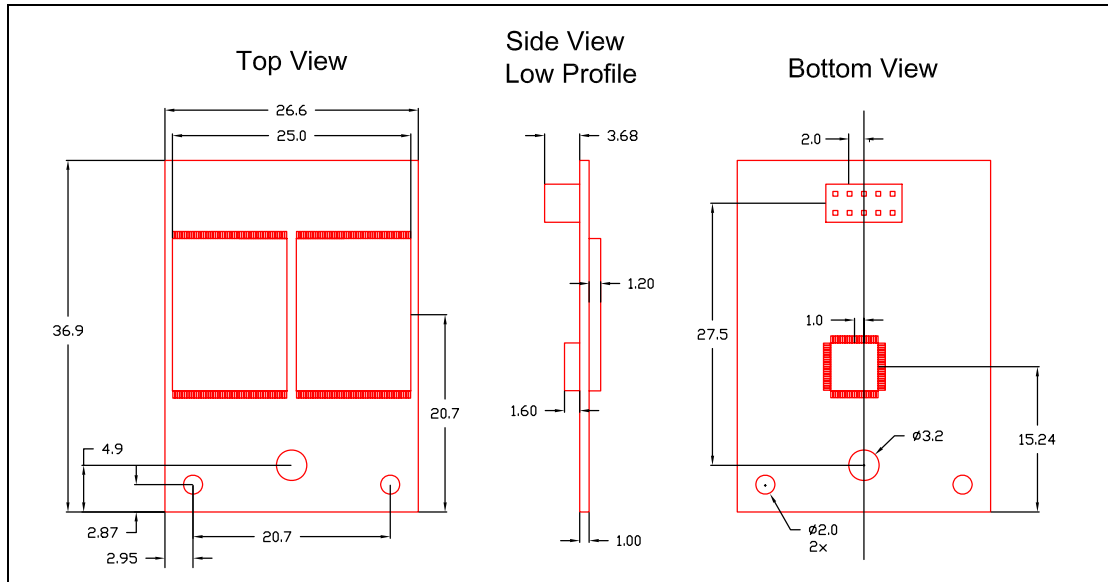


Figure 1: Physical Dimensions

SiliconDrive II USB 10-pin module is available in a horizontal version with a 2x5-pin electrical interface.

STANDARD USB HEADER

The following table lists the host interface header pins and signals.

Table 1: Host Interface 2x5 Header

Pin	Signal	Pin	Signal
1	+5VDC	2	+5VDC
3	USB1 Data(-)	4	USB2 Data(-)
5	USB1 Data(+)	6	USB2 Data(+)
7	GND	8	GND
9	Key (no pin)	10	NC (future option in the Low Profile configuration — Write Protection signal)

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CONNECTOR

The following figure illustrates the USB 10-pin module 2x5 device interface connector.

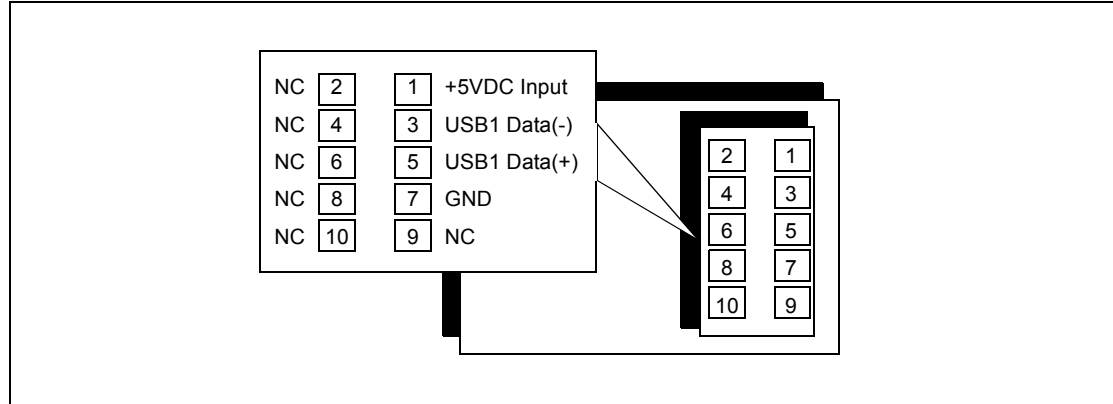


Figure 2: 2x5 Connector Pinout (Bottom View)

PRODUCT SPECIFICATIONS

Note: All SiliconDrive II USB 10-pin module values quoted are typical at 25°C and nominal supply voltage.

SYSTEM PERFORMANCE

Table 2: System Performance

Read Transfer Rate (Typical)	20MBps
Write Transfer Rate (Typical)	16MBps

SYSTEM POWER REQUIREMENTS

Table 3: System Power Requirements

DC Input Voltage	5.0 ± 5%
Sleep (Standby Current)	<500uA
Read (Typical)	100mA
Write (Typical)	110mA

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MTBF

Table 4: MTBF

MTBF (@ 25°C)	>4,000,000 hours
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ENVIRONMENTAL SPECIFICATIONS

Table 5: Environmental Specifications

Temperature	0°C to 70°C (Commercial) -40°C to 85°C (Industrial)
Humidity	8% to 95% non-condensing
Vibration	16.3gRMS, MIL-STD-810F, Method 514.5, Procedure I, Category 24
Shock	1000G, Half-sine, 0.5ms Duration 50g Pk, MIL-STD-810F, Method 516.5, Procedure I
Altitude	80,000ft, MIL-STD-810F, Method 500.4, Procedure II

ABSOLUTE MAXIMUM RATINGS

Table 6: Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Storage Temperature	T _S	-55	125	°C
Operating Temperature*	T _A	-40	85	°C
V _{CC} with Respect to GND	V _{CC}	-0.3	6.0	V
Input Voltage	V _{IN}	-0.3	6.0	V
Input/Output Voltage	V _{IO}	-0.3	V _{CC} + 0.3	V

* = Industrial temperature version.

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DC CHARACTERISTICS

Table 7: DC Characteristics

Parameter	Symbol	Test Conditions	Minimum	Typical	Maximum	Unit
Supply Voltage	V_{CC}	-	4.75	5.00	5.25	V
Supply Current (RMS):						
Operating	I_{CC}	$V_{CC} = 5.0V$	-	100	110	mA
Suspend	I_{CCS}	$V_{CC} = 5.0V$	-	<500	<500	μA
Input Levels USB Signals (D+, D-):						
Low	V_{IL}	-	-0.3	-	0.8	V
High	V_{IH}	-	2.0	-	$V_{CC} + 0.3$	V
Output Voltage USB Signals (D+, D-):						
Low	V_{OL}	$I_{OL} = 2mA$	-	-	0.4	V
High	V_{OH}	$I_{OH} = -2mA$	2.4	-	-	V
Output Signal Crossover Voltage USB Signals (D+, D-)	V_{CRS}	-	1.3	-	2.0	V

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SALES AND SUPPORT

To order or obtain information on pricing and delivery, contact your SiliconSystems Sales Representative.

PART NUMBERING

NOMENCLATURE

The following table defines the SiliconDrive II USB 10-pin module part numbering scheme.

Table 8: Part Numbering Nomenclature

SSD-	M	YYY	I	T	-4001 Part number suffix — contact your SiliconSystems' Sales Representative
					Temperature Range: • Blank = Commercial • I = Industrial
					Interface: U = USB
					Capacity: 01G to 1GB to 04G = 4GB
					Form Factor: M = Module
SiliconSystems' SiliconDrive					

PART NUMBERS

The following table lists the SiliconDrive II's part numbers.

Table 9: Part Numbers

Part Number	Capacity
SSD-M04GU(I)-4001	4GB
SSD-M02GU(I)-4001	2GB
SSD-M01GU(I)-4001	1GB

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RELATED DOCUMENTATION

For more information, visit www.siliconsystems.com or contact your SiliconSystems Sales Representative.

Table 10: Related Documentation

SiliconDrive II		
Application-Specific Description		Document Number
Technology		
SiProtect	Protection software for password-required, read/write, or read-only access.	SSANxx-SilDrvSec-R
SiSweep	Ultra-fast data erasure	SSANxx-SilDrvSec-R
SiPurge	Non-recoverable data erasure	SSANxx-SilDrvSec-R



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