DATA SHEET

SILICONDRIVE II USB CF

SSD-CXXXU(I)-4000

OVERVIEW

The SiliconDrive II USB CF 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 CF 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 16GB
- MTBF 4,000,000 hours

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REVISION HISTORY

Document No.	Release Date	Changes
4000CU-10DSR	February 2, 2009	**Updated:** • "System Reliability" table and changed the name to "Reliability." • "Related Documentation" table. **Added:** • “Projected Operational Life Span.”
4000CU-09DSR	December 31, 2008	**Updated:** • Capacity to 16GB. • “DC Characteristics” table. • “Part Numbering Nomenclature” table. **Added:** • “Projected Operational Life Span.” **Removed:** • "I/O Access Read Timing." • "I/O Access Write Timing."
4000CU-08DSR	May 7, 2008	**Updated:** • “Overview.” • "System Performance" table. • "System Power Requirements" table. **Removed:** • "Product Capacity Specifications." • "Impedance."
SSDS07-4000CU-R	April 3, 2008	External initial release with internal updates.
SSDS06-4000CU-RP	March 20, 2008	Internal updates.
SSDS05-4000CU-RP	February 7, 2008	Internal updates.
SSDS04-4000CU-RP	August 1, 2007	Internal updates.
SSDS03-4000CU-RP	June 26, 2007	Internal updates.
SSDS02-4000CU-RP	May 31, 2007	Internal updates.
SSDS01-4000CU-RP	May 10, 2007	Internal updates.
SSDS00-4000CU-RP	February 27, 2007	Initial internal release.

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PHYSICAL SPECIFICATIONS

The SiliconDrive II USB CF products are offered in an industry-standard Type I form factor. See "Part Numbering" on page 7 for details regarding USB CF capacities.

PHYSICAL DIMENSIONS

This section provides diagrams that describe the physical dimensions for the USB CF.

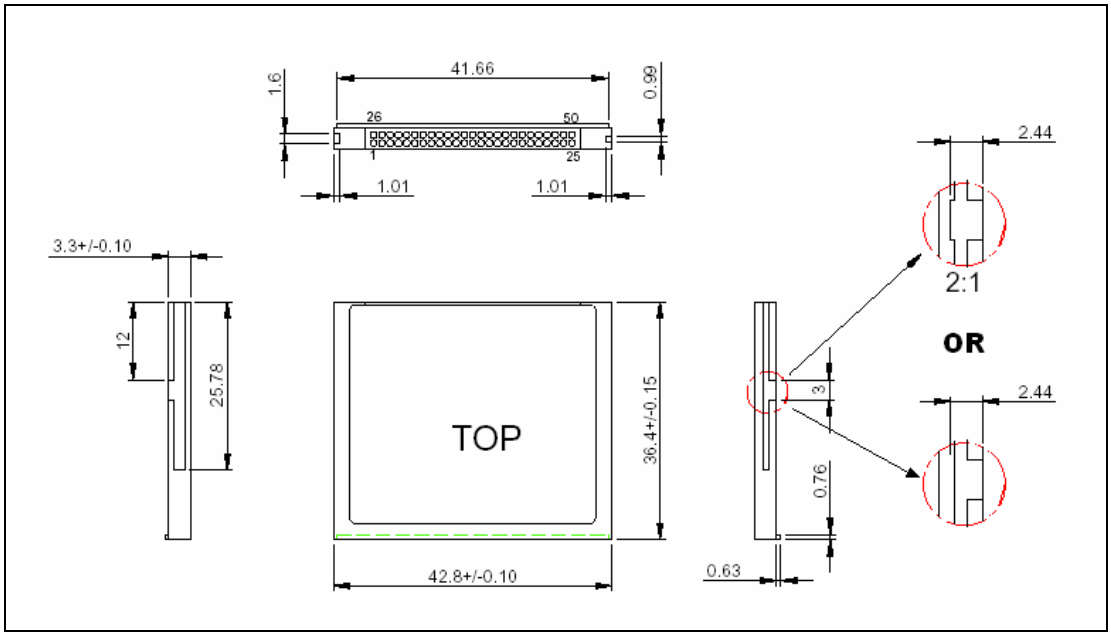

Figure 1: Physical Dimensions

PRODUCT SPECIFICATIONS

Note: All SiliconDrive II USB CF values quoted are typical at 25°C and nominal supply voltage.

SYSTEM PERFORMANCE

Table 1: System Performance

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

SYSTEM POWER REQUIREMENTS

Table 2: System Power Requirements

DC Input Voltage	3.3 ± 10%	5.0 ± 10%
Sleep (Standby Current)	<500uA	<500uA
Read (Typical/Peak)	20mA/75mA	30mA/100mA
Write (Typical/Peak)	30mA/75mA	40mA/100mA

RELIABILITY

Table 3: Reliability

MTBF (@ 25ºC)	4,000,000 hours
Bit Error Rate	<1 non-recoverable error in 10^{14} bits read

PROJECTED OPERATIONAL LIFE SPAN

Table 4: Operational Life Span

SiliconDrive Part#	Capacity	Service Life*		GB Written per Day
SSD-C16GU-4000	16GB	129.9 Years	@	337.5GB
SSD-C08GU-4000	8GB	64.9 Years	@	337.5GB
SSD-C04GU-4000	4GB	32.5 Years	@	337.5GB
SSD-C02GU-4000	2GB	16.2 Years	@	337.5GB
SSD-C01GU-4000	1GB	8.1 Years	@	337.5GB

* There are unlimited read cycles. Service life is determined using SiliconSystems' LifeEst calculation at 100% duty cycle with 25% write cycles.

LifeEst is a comprehensive measurement that considers numerous factors to determine the projected life span of a SiliconDrive. A white paper that describes the benefits of LifeEst and how to calculate it can be found at http://www.siliconsystems.com/resources/Documents/Whitepaper/SiliconSystems_NAND_Evolution.pdf.

The actual life of a SiliconDrive is dependant on the customer usage model. SiSMART is a patented technology of SiliconSystems that enables host systems to monitor actual usage of a SiliconDrive in real time. SiSMART measures and reports the remaining life of a SiliconDrive. For more information on SiSMART, refer to the *Eliminating Unscheduled Downtime by Forecasting Useable Life* white paper at http://www.siliconsystems.com/technology/pdfs/SiliconDrive_SiSMART.pdf.

ENVIRONMENTAL SPECIFICATIONS

Table 5: Environmental Specifications

Temperature	0ºC to 70ºC (Commercial) -40ºC to 85ºC (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

ELECTRICAL SPECIFICATION

PIN ASSIGNMENTS

The following table describes the SiliconDrive II USB CF 50-pin IDE connector signals.

Table 6: Pin Assignments

Pin	USB CF
1	GND
10	D-
11	D+
13	V_{CC}
38	V_{CC}
50	GND

ABSOLUTE MAXIMUM RATINGS

Table 7: Absolute Maximum Ratings

Symbol	Parameter	Minimum	Maximum	Units
T_S	Storage Temperature	-55	125	°C
T_A	Operating Temperature	-40	85	°C
V_{CC}	V_{CC} with Respect to GND	-0.3	6.7	V
V_{IN}	Input Voltage	-0.5	6.0	V
V_{OUT}	Output Voltage	-0.3	5.8	V

DC CHARACTERISTICS

Table 8: DC Characteristics for Full-Speed Operation

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	-	87	100	mA
Suspend	I_{CCS}	V_{CC} = 5.0V	-	<500	<500	µA
Max Current Consumption (Peak Value)	-	-	-	-	105	mA
Input Levels USB Signals (D+, D-):						
Low	V_{IL}	-	-	-	0.8	V
High	V_{IH}	-	2.5	-	-	V
Output Voltage USB Signals (D+, D-):						
Low	V_{OL}	R_L of 1.5K to 3.6V	0	-	0.4	V
High	V_{OH}	R_L of 15K to GND	2.6	-	3.6	V
Output Signal Crossover Voltage USB Signals (D+, D-)	V_{CRS}	-	1.3	-	2.0	V

Table 9: DC Characteristics for High-Speed Operation

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	120	mA
Suspend	I_{CCS}	V_{CC} = 5.0V	-	<500	<500	µA
Max Current Consumption (Peak Value)	-	-	-	-	150	mA
Input Levels USB Signals (D+, D-):						
Low	V_{IL}	-	-	-	0.8	V
High	V_{IH}	-	2.5	-	-	V
Output Voltage USB Signals (D+, D-):						
Low	V_{OL}	R_L of 1.5K to 3.6V	0	-	0.4	V
High	V_{OH}	R_L of 15K to GND	2.6	-	3.6	V
Output Signal Crossover Voltage USB Signals (D+, D-)	V_{CRS}	-	1.3	-	2.0	V

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 CF part numbering scheme.

Table 10: Part Numbering Nomenclature

SSD-	C	YYY	I	T	-4000
					Part number suffix — contact your SiliconSystems' Sales Representative
				Temperature Range: • Blank = Commercial • I = Industrial	
			Interface: U = USB		
		Capacity: 01G to 1GB to 16G = 16GB			
	Form Factor: C = CF				
SiliconSystems' **S**ilicon**D**rive					

PART NUMBERS

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

Table 11: Part Numbers

Part Number	Capacity
SSD-C16GU(I)-4000	16GB
SSD-C08GU(I)-4000	8GB
SSD-C04GU(I)-4000	4GB
SSD-C02GU(I)-4000	2GB
SSD-C01GU(I)-4000	1GB

ROHS 6 OF 6 PRODUCT LABELING — PB-FREE IDENTIFICATION LABEL

The Pb-free identification label indicates that the enclosed components/ devices and/or assemblies do not contain any lead (i.e., they are lead-free, as defined in RoHS directive 2002/95/ED). The above symbol is on all RoHS 6 of 6 compliant product labels, as seen in Figure 2.

SAMPLE LABEL

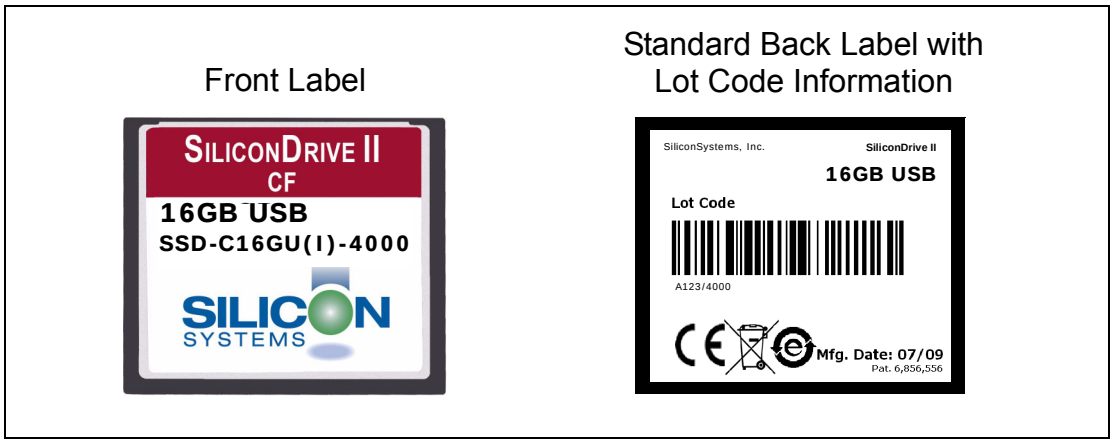

Figure 2: Sample Label

RELATED DOCUMENTATION

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

Table 12: Related Documentation

SiliconDrive II Application-Specific Technology	Description	Document Number
SiProtect	Protection software for password-required, read/write, or read-only access.	WP-003-0xR
SiSweep	Ultra-fast data erasure.	SiSecure-0xANR
SiPurge	Non-recoverable data erasure.	SiSecure-0xANR