BiTMICRO® Networks, Inc.

Data Sheet

E-Disk®
IDE/ATA 2.5"

Inject Speed Into Your Network

Today's data explosion has created the need for a faster and higher performance storage solution for high-speed networking, broadband communications, mobile computing, military, aerospace, and industrial applications. BiTMICRO® Networks has responded with a storage solution designed specifically for these emerging high performance applications — solid state, flash-based E-Disk®. Incorporate this new storage product as a stand-alone solution or as an embedded plug and play component in the system. E-Disk® provides increased performance by eliminating seek time and latency for faster I/O rates, and provides the advantages of exceptional performance, superior reliability, and unprecedented durability.

Reliable & Secure Solid-State, Flash-Based Storage

BiTMICRO® Networks utilizes proven solid-state, flash-based E-Disk® technology, a non-volatile storage solution in an industry standard 2.5-inch form factor. Ideal as a direct drop-in replacement for conventional rotating media such as hard disks and tape drives that are not only prone to short production life, but often fail in mobile computing and industrial environments where temperature fluctuations, shock, vibration, dust, moisture, or magnetic fields are present.

Given today's critical national security and defense requirements, the powerful and user-customizable securErase® data security feature guarantees that device sanitization of sensitive data is performed beyond retrieval. Patented PowerGuard® also ensures that within 6 hours of losing power to the disk, securErase® can still be activated to resume and complete the erase process.

E-Disk® IDE/ATA 2.5-inch Series

BiTMICRO® Networks E-Disk® IDE/ATA products deliver a solid solution for data storage and protection while providing the powerful performance and speed today's data-intensive applications demand. They feature patented FlashBus™ storage technology to speed performance, eliminate system bottlenecks, and offer durable storage for easy installation and start-up. E-Disk® requires no device drivers for installation and operation, and boasts random I/O rates of up to 25,000/sec, burst read/write rates of up to 133 MB/sec, sustained

Decrease data access times and increase data transfer rates with the most innovative and reliable solutions for information retrieval and storage.

random read/write rates of up to 110 MB/sec, and capacities of up to 75.8 GB.

Product Highlights:

Increased High Speed Networking

+ Operating System Independent
+ 1,500 to 25,000 IOPS*
+ 100 to 39 μsec access time*

Facilitate Quick Data Transfers

+ 16.7 to 133 MB/s Burst R/W Rate*
+ 14 to 110 MB/sec Sustained R/W Rate*

Highest Storage Capacities

+ 2.5-inch: 512 MB to 75.8 GB

*Preliminary / Upcoming Feature

Unparalleled Operating Performance

+ Pure Solid State/Non-Volatile
+ 1,500 Gs Operating Shock
+ – 60 to + 95 °C
+ 2 Million Hours MTBF
+ 120,000 feet Altitude

Industry Standard IDE Interface

+ No Device Driver Required
+ IDE to UDMA 133 Support*
+ Completely bootable

Data Security Features

+ DataSentinel
+ PowerGuard®
+ securErase®
+ Write Protect

BiTMICRO®
ULTIMATE STORAGE SOLUTIONS™

SPECIFICATIONS FOR E-DISK® 2.5" IDE/ATA SERIES
Flash Disk and Solid State Disk Storage Solutions

PHYSICAL SPECIFICATIONS:

Form Factor		2.5"
Storage Capacity		512 MB to 75776 MB
Dimensions	Width	2.75 in (69.85 mm)
	Length	4.00 in (101.6 mm)
	Height	0.335 in (8.509 mm) to 0.979 in (24.867 mm)
Weight		100.1 gm (3.94 oz) to 266.5 gm (10.49 oz)
Mounting Considerations		HDD Industry Standard, All Orientations
Connector		44-Pin / 50-Pin 2.00 mm IDE/ATA ANSI Standards

POWER REQUIREMENTS:

Input Voltage		5 Vdc (±5%)
Power Consumption	E-Disk® Capacity	17,408 MB
	Write	3.3 watts
	Read	3.1 watts
	Idle	2.4 watts

PERFORMANCE SPECIFICATIONS:

Access Time	250 – 68 μsec (250 – 39 μsec)*
Burst R/W Rate	16.7 – 66 MB/sec (16.7 – 133 MB/sec)*
Random Sustained R/W Rate	14 – 28 MB/sec (14 – 110 MB/sec)*
Read Bit Error Rate	$< 10^{-20}$
Entire Media Erase	< 3 sec/memory board (2 GB)
Full Associative Cache	Standard: up to 128 MB

*Preliminary / Upcoming Features

ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	Commercial	0 to 70 °C
	Extended	-25 to 75 °C
	Industrial	-40 to 85 °C
	Military	-60 to 95 °C
Storage Temperature		-60 to 125 °C
Humidity		5 to 95% (non-condensing)
Shock (Operating)		Half Sine, 50G, 11ms, Half Sine, 1,500G, 0.5ms; per MIL-STD-810C
Vibration (Operating)		16.4 G rms; Per MIL-STD-810E, Method 514.4-21
Altitude		-1,200 to 120,000 feet
Airflow		None Required

RELIABILITY:

MTBF		> 1.9 Million Hours @ Bellcore Issue 6, Method I, Case 3	
Undetected Data Errors		$< 10^{-30}$	
Data Reliability		Built-in EDC/Interleaved Reed-Solomon ECC Corrects up to Six Random Byte Error per 528-Byte Block; Detects Burst Errors up to 9 Bytes Long	
Data Integrity		10 years	
Write Endurance (Typical)		1 GB E-Disk®	4.6 GB E-Disk®
		27 years @ 100GB/day erase/write cycles	123 years @ 100GB/day erase/write cycles
Read Endurance		Unlimited	
Security Erase Compliance		NISPOM DoD 5220.22-M, NSA 130-2, Air Force AFSSI 5020, Army 380-19, Navy NAVSO P-5239-26	
Diagnostics		Built-in Power Power-up Self Test Self-Monitoring Diagnostics Database	

SPECIFICATIONS FOR E-DISK® 2.5" IDE/ATA SERIES
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USER INTERFACE:

LEDs (Remote Capability)	Idle, Busy, Cache Busy, Fault
Jumper Settings	Save Settings, Write Protect
Drivers	None Required
Firmware	Field Upgradeable

ATA Compatibility	ANSI X3T13/1153D ATA-4:
	  E-Disk® 2A16: Supports PIO Modes 0 - 4; DMA Modes 0- 2
	ANSI T13/1532D 8 Jul 2002 (ATA/ATAPI-7)
	  E-Disk® 2A33: Supports PIO Modes 0 - 4; UDMA Mode 0 - 2
	  E-Disk® 2A66: Supports PIO Modes 0 - 4; UDMA Mode 0 - 4
	  *E-Disk® 2A100: Supports PIO Modes 0 - 4; UDMA Mode 0 - 5
	  *E-Disk® 2A133: Supports PIO Modes 0 - 4; UDMA Mode 0 - 6

EMI Compliance	CE, FCC, VCCI and AS/NZS Regulations
Safety Compliance	TÜV and UL

*Preliminary / Upcoming Products

PERFORMANCE MATRIX:

MODEL NAME	FORM FACTOR	ATA MODES	SUSTAINED R/W RATES	BURST R/W RATES	ACCESS TIMES	STORAGE CAPACITY
E-Disk® 2A16	2.5"	PIO 0 - 4; DMA 0 - 2	14 MB/sec	16.7 MB/sec	0.1 msec	512 MB - 75776 MB
E-Disk® 2A33	2.5"	PIO 0 - 4; UDMA 0 - 2	22 MB/sec	33.3 MB/sec	88 μsec	512 MB - 75776 MB
E-Disk® 2A66(2)	2.5"	PIO 0 - 4; UDMA 0 - 4	28 MB/sec	66.6 MB/sec	68 μsec	512 MB - 75776 MB
*E-Disk® 2A66	2.5"	PIO 0 - 4; UDMA 0 - 4	40 MB/sec	66.6 MB/sec	48 μsec	512 MB - 75776 MB
*E-Disk® 2A100	2.5"	PIO 0 - 4; UDMA 0 - 5	68 MB/sec	100 MB/sec	42 μsec	512 MB - 75776 MB
*E-Disk® 2A133	2.5"	PIO 0 - 4; UDMA 0 - 6	110 MB/sec	133 MB/sec	39 μsec	1024 MB - 75776 MB

*Preliminary / Upcoming Products

CAPACITY, HEIGHT AND WEIGHT MATRIX:

FLASH (512 Mb) E-DISK® CAPACITY (MB)	FLASH (1024 Mb) E-DISK® CAPACITY (MB)	FLASH (2048 Mb) E-DISK® CAPACITY (MB)	E-DISK® HEIGHT (in)	E-DISK® HEIGHT (mm)	E-DISK® WEIGHT (oz)*	E-DISK® WEIGHT (gm)*
512	1024	2048	0.335	8.509	3.940	111.697
2560	5120	10240	0.496	12.598	5.580	158.190
4608	9216	18432	0.657	16.688	7.210	204.399
6656	13312	26624	0.818	20.777	8.850	250.893
8704	17408	34816	0.979	24.867	10.490	297.386
10752	21504	43008	1.140	28.954	12.130	343.879
12800	25600	51200	1.301	33.043	13.770	390.373
14848	29696	59392	1.462	37.132	15.410	436.866
16896	33972	67584	1.623	41.221	17.050	483.359
18944	37888	75776	1.784	45.310	18.690	529.852

*Weights are approximate

POWERGUARD® HEIGHT AND WEIGHT MATRIX:

2.5" PowerGuard®	PG1 (embedded)	PG2	PG3
Height (mm)	0	7.696	10.922
Weight (gm)*	51.03	87.88	138.92

*Weights are approximate

SPECIFICATIONS FOR E-DISK® 2.5" IDE/ATA SERIES
Flash Disk and Solid State Disk Storage Solutions

PRODUCT PART NUMBER:

Part Number	Model Number + Capacity + Options
	PFIRRRC + XXXXXX + TGMC
Example	D2A066B 075776 CNN(N)(2) **Note (N)(2) Sub-Part Number
Model Number	PFIRRRC
P: Product Type	D: E-Disk®
F: Form Factor	2: 2.5-inch
I: Interface	A: ATA/IDE
R: Burst (Sustained) Read/Write Rate	016: 16.7 MB/sec (14 MB/sec) 033: 33.3 MB/sec (22 MB/sec) 066(2): 66.6 MB/sec (28 MB/sec) **Note: (2) Sub-Part Number 066: 66.6 MB/sec (40 MB/sec)* 100: 100 MB/sec (68 MB/sec)* 133: 133 MB/sec (110 MB/sec)*
C: Connector Type/Channel	B: 44/50-pin 2.00 mm ANSI IDE/ATA Standard
Capacity	XXXXXX
X: Capacity (MB) — 512 Mbit Flash	512, 2560, 4608, 6656, 8704, 10752, 12800, 14848, 16896, 18944
X: Capacity (MB) — 1024 Mbit Flash	1024, 5120, 9216, 13312, 17408, 21504, 25600, 29696, 33792, 37888
X: Capacity (MB) — 2048 Mbit Flash	2048, 10240, 18432, 26624, 34816, 43008, 51200, 59392, 67584, 75776
Options	TGMC
T: Temperature (Operating)	C: Commercial (0 to +70 °C) E: Extended (-25 to +75 °C) I: Industrial (-40 to +85 °C) M: Military (-60 to +95 °C)
G: PowerGuard®	N: No PowerGuard® Option (default) 1: PowerGuard® Option 1 – Auto-Save Cache to Flash on Power Down 2: PowerGuard® Option 2 – Erase Mode on Power Down 3: PowerGuard® Option 3 – Standby Erase Mode on Power Down
M: Media Type	N: NAND Flash
(C): PCB Coating	(N): No Conformal Coating **Note Sub-Part Number (A): Acrylic Conformal Coating **Note Sub-Part Number (S): Silicone Conformal Coating **Note Sub-Part Number

*Preliminary / Upcoming Features
**Consult E-Disk® Part Numbering Guide

BiTMICRO®'s product specifications and engineering development objectives are subject to change at anytime without prior notice. All information provided herein is provided for design comparison and reference purposes only.

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Ultimate Storage Solutions