



# E-Disk<sup>®</sup> SCSI Wide Series



## Ideal for storage applications in:

- Military Systems
- Aerospace and Avionics
- Energy and Utilities
- Medical, Laboratory and Scientific Research
- Enterprise Systems
- Industrial Automation
- Real-Time Data Acquisition
- Control and Instrumentation
- Transportation Infrastructures

### 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, medical and industrial applications. BitMICRO<sup>®</sup> Networks has responded with a storage solution designed specifically for these emerging high performance applications — solid state, flash-based E-Disk<sup>®</sup>. Incorporate this new storage product as a stand-alone solution or as an embedded plug and play component in the system. E-Disk<sup>®</sup> 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<sup>®</sup> Networks utilizes proven solid-state, flash-based E-Disk<sup>®</sup> technology, a non-volatile storage solution in an industry standard 3.5-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<sup>®</sup> data security feature guarantees that device sanitization of sensitive data is performed beyond retrieval. Patented PowerGuard<sup>®</sup> also ensures that up to 6 hours of losing power to the disk, securErase<sup>®</sup> can still be activated to resume and complete the erase process.

### E-Disk<sup>®</sup> SCSI Wide Series

BitMICRO<sup>®</sup> Networks E-Disk<sup>®</sup> SCSI 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<sup>™</sup> storage technology to speed performance, eliminate system bottlenecks, and offer durable storage for easy installation and start-up. E-Disk<sup>®</sup> requires no device drivers for installation and operation, and boasts random I/O rates of up to 11,700/sec, burst rates of up to 320 MB/sec, sustained rates of up to 44 MB/sec, and capacities of up to 155.6 GB.

### Product Highlights

#### Increased High Speed Networking

- Operating System Independent
- 9,500 to 11,700 IOPS
- 0.5 to 0.39 msec access time

#### Facilitate Quick Data Transfers

- 40 to 320 MB/s Duplex Burst Rate
- 34 to 44 MB/sec Sustained Rate

#### Highest Storage Capacities

- 3.5-inch: 1024 MB to 155.6 GB

#### 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 SCSI Interface

- No Device Driver Required
- Ultra to Ultra320 SCSI Wide
- Completely bootable

#### Data Security Features

- DataSentinel
- PowerGuard<sup>®</sup>
- securErase<sup>®</sup>

\* Projected (Ultra320 model only)

\*\* - 40 to + 85 °C for units with PowerGuard<sup>®</sup>

**SPECIFICATIONS FOR E-DISK® SCSI WIDE SERIES**  
**Flash Disk and Solid State Disk Storage Solutions**

**Physical Specifications:**

Form Factor	3.5"		
Storage Capacity	1024 MB to 155648 MB		
Dimensions	Width	101.6 mm (4.0 in)	
	Length	146.1 mm (5.75 in)	
	Height	13.34 mm (0.525 in) to 51.21 mm (2.016 in)	
Weight	319.31 gm (11.263 oz) to 1367.81 gm (48.248 oz)		
Mounting Considerations	HDD Industry Standard, All Orientations		
Connector	68-Pin or SCA 80-Pin (Level-4 Hot Swap) SCSI ANSI Standards		

**Power Requirements:**

Input Voltage	5 VDC (±5%), 12 VDC (±5%)				
Power Consumption	E-Disk® Capacity	36,864 MB (Ultra Wide)	77,824 MB (Ultra Wide)	36,864 MB (Ultra320)	77,824 MB (Ultra320)
	Write	3.3 watts	4.5 watts	21.2 watts	23.5 watts
	Read	3.1 watts	4.3 watts	20.4 watts	22.1 watts
	Idle	2.4 watts	3.6 watts	13.5 watts	14.5 watts

**Performance Specifications:**

Access Time	0.5 to 0.39 msec
Burst Rate	40, 320 MB/sec
Sustained Rate	34, 44 MB/sec
I/O Operations per Second	9500, 11700 IOPS
Read Bit Error Rate	< 10 <sup>-20</sup>
Fully Associative Cache	Standard (Ultra Wide): up to 128 MB Standard (Ultra 320): up to 256 MB

**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	-55 to 125 °C	
Humidity	5 to 95% (non-condensing)	
Shock (Operating)	Ultra Wide	1,500 G
	Ultra320	1,500 G**
Vibration (Operating)	16.4 G rms**	
Altitude	-1,200 to 120,000 feet	
Airflow	None Required	

\* Not available for units with PowerGuard®  
 \*\* Projected

**Reliability:**

MTBF	> 1.9 Million Hours @ Bellcore Issue 6, Method I, Case 3	
Undetected Data Errors	< 10 <sup>-30</sup>	
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, IRIG-106	
Diagnostics	Built-in Power-up Self Test	
	Self-Monitoring Diagnostics Database	

**SPECIFICATIONS FOR E-DISK® SCSI WIDE SERIES**  
**Flash Disk and Solid State Disk Storage Solutions**

 **User Interface:**

<b>LEDs (Remote Capability)</b>	Idle, Busy, Cache Busy, Fault
<b>Jumper Settings</b>	Save Settings
<b>Termination</b>	Multi-Mode: Single-Ended / Low Voltage Differential
<b>Drivers</b>	None Required
<b>Firmware</b>	Field Upgradeable
<b>SCSI Compatibility</b>	ANSI SCSI-2 Standard X3.131-1994 ANSI SCSI-3 Standard X3T10/1071D ANSI SCSI-3 Standard X3T10/1142D ANSI SCSI-3 Standard X3T10/1302D ANSI SCSI-3 Standard X3T10/1365D
<b>EMI Compliance</b>	CE, FCC, VCCI and AS/NZS Regulations
<b>Safety Compliance</b>	TÜV and UL

 **Performance Matrix:**

MODEL NAME	FORM FACTOR	CONNECTOR	SCSI Wide 16-bit INTERFACE	SUSTAINED R/W RATES	BURST R/W RATES	IOPS	STORAGE CAPACITY
E-Disk® 3S40D	3.5"	68-pin	Ultra Wide	34 MB/sec	40 MB/sec	9,500	1024 MB-147456 MB
E-Disk® 3S40E	3.5"	80-pin SCA	SCA Ultra Wide	34 MB/sec	40 MB/sec	9,500	1024 MB-147456 MB
E-Disk® 3S320D	3.5"	68-pin	Ultra 320	44 MB/sec	320 MB/sec	11,700	2048 MB-155648 MB
E-Disk® 3S320E	3.5"	80-pin SCA	SCA Ultra 320	44 MB/sec	320 MB/sec	11,700	2048 MB-155648 MB

 **Capacity, Height And Weight Matrix (Ultra Wide):**

E-DISK® CAPACITY (MB)	E-DISK® HEIGHT* (in)	E-DISK® HEIGHT* (mm)	E-DISK® WEIGHT** (oz)	E-DISK® WEIGHT** (gm)
1024, 2048	0.525	13.34	9.834	278.78
5120, 10240, 16384	0.690	17.53	13.943	395.28
9216, 18432, 32768	0.855	21.72	18.053	511.78
13312, 26624, 49152	1.020	25.91	22.162	628.28
34816, 65536	1.185	30.10	26.271	744.78
43008, 81920	1.350	34.29	30.381	861.28
51200, 98304	1.515	38.48	34.490	977.78
59392, 114688	1.680	42.67	38.600	1094.28
67584, 131072	1.845	46.86	42.709	1210.78
75776, 147456	2.010	51.05	46.818	1327.28

\* PowerGuard height not included  
 \*\* Weights are approximate

 **Capacity, Height And Weight Matrix (Ultra320):**

E-DISK® CAPACITY (MB)	E-DISK® HEIGHT* (in)	E-DISK® HEIGHT* (mm)	E-DISK® WEIGHT** (oz)	E-DISK® WEIGHT** (gm)
2048, 4096, 8192	0.531	13.49	11.263	319.31
6144, 12288, 24576	0.696	17.68	15.373	435.81
10240, 20480, 40960	0.861	21.87	19.482	552.31
14336, 28672, 57344	1.026	26.06	23.592	668.81
36864, 73728	1.191	30.25	27.701	785.31
45056, 90112	1.356	34.44	31.811	901.81
53248, 106496	1.521	38.63	35.920	1018.31
61440, 122880	1.686	42.82	40.029	1134.81
69632, 139264	1.851	47.02	44.139	1251.31
77824, 155648	2.016	51.21	48.248	1367.81

\* PowerGuard height not included  
 \*\* Weights are approximate

**SPECIFICATIONS FOR E-DISK® SCSI WIDE SERIES**  
**Flash Disk and Solid State Disk Storage Solutions**  
**Security Erase (Ultra Wide):**

E-DISK® CAPACITY (MB)	ERASE TIME*	E-DISK® CAPACITY (MB)	ERASE TIME*	E-DISK® CAPACITY (MB)	ERASE TIME*
1024, 5120, 9216	8 secs	2048, 10240, 18432	16 secs	16384, 32768	33 secs
13312	16 secs	26624, 34816, 43008	33 secs	49152, 65536, 81920	66 secs
		51200, 59392, 67584	49 secs	98304, 114688, 131072	98 secs
		75776	66 secs	147456	131 secs

\*Estimated full erase times using default pattern of 1111s or FFFFs.

 **Security Erase (Ultra320):**

E-DISK® CAPACITY (MB)	ERASE TIME*	E-DISK® CAPACITY (MB)	ERASE TIME*	E-DISK® CAPACITY (MB)	ERASE TIME*
2048, 6144	8 secs	4096, 12288	16 secs	8192, 24576	33 secs
10240, 14336	16 secs	20480, 28762	33 secs	40960, 57344	66 secs
		36864, 45056	49 secs	73728, 90112	98 secs
		53248, 61440	66 secs	106496, 122880	131 secs
		69632, 77824	82 secs	139264, 155648	164 secs

\*Estimated full erase times using default pattern of 1111s or FFFFs.

 **PowerGuard® Height and Weight Matrix:**

3.5" PowerGuard®	PG1 (embedded)	PG1	PG2	PG3
Height (mm)	0	7.87	7.87	11.33
Weight (gm)*	29.74	230.51	230.51	258.26

\*Weights are approximate



**SPECIFICATIONS FOR E-DISK® SCSI WIDE SERIES**  
**Flash Disk and Solid State Disk Storage Solutions**

 **Product Part Number:**

<b>Part Number</b>	Model Number + Capacity + Options + Sub-Part Number	
	PFISSSC + XXXXXX + TGV + (C)	
Example	D3S320D 155648 C1N (A) *Note (A) Sub-Part Number	
<b>Model Number</b>	PFISSSC	
P: Product Type	D: E-Disk®	
F: Form Factor	3: 3.5-inch	
I: Interface	S: SCSI	
S: Burst (Sustained) Rate	040: 40 MB/sec (34 MB/sec) 320: 320 MB/sec (44 MB/sec)	
C: Connector Type/Channel	D: 68-pin SE/LVD (SCSI 16-bit) E: 80-pin SCA-2 Hot Swappable SE/LVD (SCSI 16-bit)	
<b>Capacity</b>	XXXXXX	
X: Capacity (MB)	<b>Ultra Wide</b>	1024, 5120, 9216, 13312
		2048, 10240, 18432, 26624, 34816, 43008, 51200, 59392, 67584, 75776
		16384, 32768, 49152, 65536, 81920, 98304, 114688, 131072, 147456
	<b>Ultra 320</b>	2048, 6144, 10240, 14336
		4096, 12288, 20480, 28672, 36864, 45056, 53248, 61440, 69632, 77824
		8192, 24576, 40960, 57344, 73728, 90112, 106496, 122880, 139264, 155648
<b>Options</b>	TGV	
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 1: Auto-Save Cache to Flash on Power Down 2: Erase Mode on Power Down 3: Standby Erase Mode on Power Down	
V: Input Voltage	N: 5V D: Dual (5V/12V)***	
<b>Sub-Part Number*</b>	(C)	
C: PCB Coating	A: Acrylic Conformal Coating S: Silicone Conformal Coating	

\* [Consult E-Disk® Part Numbering Guide](#)  
 \*\* Not available for units with PowerGuard®  
 \*\*\* Only applicable to 3S320E

**Note:** Please contact sales for further details on any of the E-Disk features.



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6,970,890; 6,981,070. Other Patents  
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BiTMICRO<sup>®</sup>, the BiTMICRO Networks logo, FlashBus<sup>™</sup>, E-Disk<sup>®</sup>, securErase<sup>®</sup>, PowerGuard<sup>®</sup>, and Ultimate Storage Solutions<sup>™</sup> are trademarks or registered trademarks of BiTMICRO Networks, Inc. Other names are trademarks or registered trademarks of their respective owners.



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