



ATTO Technology, Inc.



## 6Gb/s SAS/SATA RAID Adapters

ExpressSAS R60F  
ExpressSAS R680  
ExpressSAS R608  
ExpressSAS R644

ATTO's ExpressSAS 6Gb/s SAS/SATA RAID Adapters offer the fastest available connectivity to SAS or SATA storage with integrated RAID protection.

### Long-Standing RAID Experience

Leveraging over 18 years of RAID technology development, ATTO's family of ExpressSAS 6Gb/s SAS/SATA RAID adapters feature the time-proven ATTO RAID Stack, DVRAID™ and CacheAssure™, proprietary technologies developed to provide the most robust RAID-based connectivity solution in the industry.

### Flexible Connectivity Solutions

With several port configuration options including 16 internal, 8 external, 8 internal, and 4 external/4 internal, ExpressSAS 6Gb/s SAS/SATA RAID adapters are ideal for a wide variety of IT and digital media environments requiring high-performance and parity RAID protected data. ExpressSAS RAID adapters offer driver support for Windows®, Linux and Mac® OS X, providing a single connectivity solution for customers with heterogeneous operating system environments.

### Performance Engineered

The ExpressSAS 6Gb/s SAS/SATA RAID adapter family allows users to instantly protect their critical data while enhancing performance. ATTO designs ExpressSAS RAID adapters to maintain full performance in degraded mode and to minimize downtime with 50% faster rebuilds, limiting exposure to a second drive failure. Exclusive latency management features like Advanced Data Streaming (ADS™) Technology and DriveAssure™ minimize data transfer interruptions to ensure the highest level of consistent performance. These differentiating capabilities make ATTO the premier choice for high-performance host-based RAID connectivity.

### Advanced Management Tools

ATTO's easy-to-use Configuration Tool features an intuitive GUI that simplifies RAID group configuration, management and monitoring. ATTO's ExpressSAS RAID adapters offer the most advanced performance tuning capabilities and troubleshooting utilities, providing users with sophisticated diagnostics and the flexibility to control settings for specific applications.

### Technical Features

- Port configurations include 16 internal, 8 external, 8 internal, and 4 internal / 4 external
- 1200 MB/s per port throughput in full-duplex mode
- Features a high-performance x8 PCIe 2.0 host interface
- Low-profile form factor
- SAS 2.0, SAS, SATA and SATA II connectivity
- Supports up to 256 SAS/SATA devices
- Exclusive Advanced Data Streaming (ADS™) Technology, DriveAssure™ and CacheAssure™
- Data Recovery mode increases the probability of retrieving lost data from a failed drive
- Disk and Tape support in one PCIe slot
- Driver support for Windows®, Linux, and Mac® OS X
- RAID 0, 1, 4, 5, 6, 10, 40, 50, 60, JBOD and DVRAID™
- 3-year standard product warranty



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# 6Gb/s SAS/SATA RAID Adapters

## ExpressSAS R60F, R680, R608, R644

### Technical Specifications

#### Applications

ExpressSAS RAID adapters add high-performance RAID data protection to direct-attached SAS and SATA JBOD storage. They are an ideal connectivity solution for high-performance media and entertainment and general IT environments. ExpressSAS 6Gb/s SAS/SATA RAID adapters deliver affordable host-level RAID for high-bandwidth workflows such as digital content creation, streaming video, transactional databases, and email and Web servers.

#### Advanced Data Streaming (ADSTM)

Latency-management technology that controls the acceleration of data transfers to move large amounts of data faster and more efficiently.

#### DriveAssure™ Technology

Drive assessment and latency management technology that minimizes the likelihood of RAID groups becoming degraded or taken offline due to slow drives, ensuring uninterrupted access to data.

#### CacheAssure™ Technology

Flash-based protection module providing a maintenance-free solution that safeguards against the loss of cached data during a power or system failure.

#### RAID Features and Functionality

- SAS 2.0, SAS, SATA and SATA II support
- RAID Levels 0, 1, 4, 5, 6, 10, 40, 50, 60, JBOD, DVRAID™
- ATTO RAID stack
- Command coalescing
- Staggered drive spin-up
- RAID level migration
- Hot swap with auto rebuild
- Online performance metrics and event logs
- Native command queuing
- 512MB ECC protected cache memory
- SES, SNMP and S.M.A.R.T. Support
- Pass-through support for tape and tape devices
- Configurable stripe size
- Online capacity expansion
- Global and dedicated hot spares
- Automatic and tunable online rebuilds
- N-way mirroring

#### User Benefits

- High performance host-based RAID for direct-attached storage
- Four port configurations for flexible connectivity
- Full performance in degraded or rebuild mode
- Flash-based cache protection protects against lost data during power or system failure
- More options for retrieving data from a failed drive with Data Recovery mode
- 50% faster rebuilds
- Efficient scalability with host-level RAID
- Maintain high priority workflows with tunable rebuilds
- RAID group partitioning for better management

#### Management Tools

- User-friendly GUI for quick and easy RAID setup
- Command Line Interface for advanced functionality
- ATTO Config Tool: BIOS-based RAID management and configuration utility

#### Bus Specifications

- x8 PCI Express 2.0 host interface

#### External Connectivity

- x4 Mini SAS connectors
- Low profile form factor; full-height bracket included

#### Operating System Support

- Windows® Server 2003, 2008,
- Windows XP, Vista, 7
- SUSE Linux
- Red Hat Linux
- Mac® OS X (10.4.x - 10.6.x)

#### Agency Approvals and Compliance

- FCC Part 15, Subpart B, Class B
- EN55024: 1998 + A1: 2001 + A2: 2003
- EN55022: 2006, Class B
- EN60950-1: 2001
- RoHS-6 Compliant

#### Dimensions

- R60F  
Length 8.638", Height 2.846"
- R608/R680/R644  
Length 6.600", Height 2.713"

#### Operating Temperature

- Hardware Environment
  - Temperature: 0-40° C
  - Humidity: 10 - 90% non-condensing
- Storage Environment
  - Temperature: -40°-70° C (-40°-157° F)
  - Humidity: 5 - 95% non-condensing

#### Operating Voltage

- R60F
  - 18W (typical)
- R680/R608/R644
  - 9.6W (typical)

#### Airflow

- 150 lf/m (min) recommended

#### Warranty

- 3 Year



	ATTO ExpressSAS R60F	ATTO ExpressSAS R680	ATTO ExpressSAS R608	ATTO ExpressSAS R644
Ports	16 Internal	8 External	8 Internal	4 External/4 Internal
Bus Characteristics	x8 PCIe 2.0	x8 PCIe 2.0	x8 PCIe 2.0	x8 PCIe 2.0
Form Factor	Low Profile	Low Profile	Low Profile	Low Profile
Connectors	4 Mini SAS (x4) SFF 8087 Internal	2 Mini SAS (x4) SFF 8088 External	2 Mini SAS (x4) SFF 8087 Internal	1 Mini SAS (x4) SFF 8088 External 1 Mini SAS (x4) SFF 8087 Internal
Part Number	ESAS-R60F-000	ESAS-R680-000	ESAS-R608-000	ESAS-R644-000

