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Leading Innovation

HDD

AL15SEB SERIES
ENTERPRISE PEFORMANCE HDD

The 12.0 Gbit/s[1] SAS interface AL15SEB Series Enterprise Performance HDDs provide up to 2.4 TB capacity and 10,500rpm performance with Enterprise-class reliability. Engineered for mission critical IT operations, including database servers and hybrid storage platforms, AL15SEB Series provides a range of models including 512 native (512n), or emulated 512 (512e) or 4K native(4Kn) sector length technologies for optimum application and operating system compatibility. Toshiba Persistent Write Cache technology protects against data loss in the event of unexpected power loss, and helps maintain suitable performance and data reliability for high-duty cycle Mission Critical environments.

Product image may represent a design model.

KEY FEATURES

- 2400, 1800, 1200, 900 and 600 GB[2] Capacity (Advanced Format sector technology models)
- 1200, 900, 600, 300GB (512n sector technology models)
- Space Efficient, Power Saving 2.5-inch[3] Form Factor
- 12.0 Gbit/s SAS Interface for Better Performance
- 10,500 rpm Performance
- Industry Leading Average Latency (2.86ms)
- 24/7 Mission Critical Workload Performance and Data Reliability
- 512n sector length support in all capacities for optimum legacy application compatibility
- Toshiba Persistent Write Cache Technology
- Sanitize Instant Erase (SIE[4]) Option

APPLICATIONS

- Tier 1 Mission-Critical Servers and RAID Storage
- Tier 1 Hybrid Storage platforms
- Servers hosting transaction-based applications
- Rack-Optimized Data Centers
- Content Serving with low-latency requirements
- Software-defined and Converged Storage architecture
- Mission-Critical Server Boot and Logging

SPECIFICATIONS

Model numbers		AL15SEB24EP AL15SEB24EQ	AL15SEB18EP AL15SEB18EQ	AL15SEB12EP AL15SEB12EQ	AL15SEB09EP AL15SEB09EQ	AL15SEB06EP AL15SEB06EQ
Interface		SAS-3.0				
Formatted Capacity		2,400 GB	1,800 GB	1,200 GB	900 GB	600 GB
Performance	Interface Speed	12.0 Gbit/s Max				
	Rotation Speed	10,500 rpm				
	Average Latency Time	2.86 ms				
	Buffer Size	128 MiB[5]				
	Data Transfer Speed (Sustained)	260.0 MiB/s				
Logical Data Block Length	AL15SEB**EP (fixed length)	4,096 B , 4,160 B , 4,224 B				
	AL15SEB**EQ (emulation)	HOST: 512 B, DISK: 4,096 B	HOST: 520 B, DISK: 4,160 B		HOST: 528 B, DISK: 4,224 B	
Supply Voltage	Allowable Voltage	12 V[6] ± 5 % / 5 V[6] ± 5%[7]				
Power Consumption[8]	Write/Read (200 I/O)	8.7 W	8.1 W	7.0 W	7.0 W	6.5 W
	Active Idle (Idle-A)	5.1 W	4.6 W	3.5 W	3.5 W	3.0 W
Acoustics (Sound Power)		31 dB Typ.				

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Model Number		AL15SEB120N	AL15SEB090N	AL15SEB060N	AL15SEB030N
Interface		SAS-3.0			
Formatted Capacity		1200 GB	900 GB	600 GB	300 GB
Performance	Interface Speed	12.0 Gbit/s Max			
	Rotation Speed	10,500 rpm			
	Average Latency Time	2.86 ms			
	Buffer Size	128 MiB			
	Data Transfer Speed (Sustained)	234.0 MiB/s			222.5 MiB/s
Logical Data Block Length		512 B , 520 B , 524 B , 528 B			
Supply Voltage	Allowable Voltage	12 V[6] ± 5 % / 5 V[6] ± 5%[7]			
Power Consumption[8]	Read/Write (200I/O)	8.1 W	7.0 W	7.0 W	6.5 W
	Active Idle (Idle-A)	4.5 W	3.5 W	3.5 W	3.0 W
Acoustics (Sound Power)	Idle[12]	31 dB Typ.			

ENVIRONMENTAL LIMITS

Item		Specification
Temperature	Operating	5 °C to 55 °C
	Non-Operating	- 40 °C to 70 °C
Humidity	Operating	5 % to 95 % R.H.
	Non-Operating	5 % to 95 % R.H.
Shock	Operating	980 m/s^2 { 100 G } / 2 ms duration
	Non-Operating	3,920 m/s^2 { 400 G } / 2 ms duration
Vibration[9]	Operating[10]	9.8 m/s^2 { 1 G } (20 to 300 Hz) or less
	Non-Operating[11]	49 m/s^2 { 5 G } (20 to 300 Hz) or less
Altitude	Operating	- 305 m to 3,048 m
	Non-Operating	- 305 m to 12,192 m

RELIABILITY

Item	Specification
MTTF[12]	2,000,000 hours
Non-recoverable Error Rate	10 error per 10^{17} bits read
Load / Unload	600,000 times
Availability	24 hours/day, 7 days/week

[1] Read and write speed may vary depending on the host device, read and write conditions, and file size.
[2] Definition of capacity: We define a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and a terabyte (TB) as 1,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2^{30} = 1,073,741,824 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.
[3] "2.5-inch" describes the form factor of HDDs. They do not indicate drive's physical size.
[4] Sanitize Instant Erase. SIE is a function to invalidate the data recorded on the magnetic disks at a blink.
[5] A kibibyte (KiB) means 2^{10}, or 1,024 bytes, a mebibyte (MiB) means 2^{20}, or 1,048,576 bytes, and a gibibyte (GiB) means 2^{30}, or 1,073,741,824 bytes.
[6] Input voltages are specified at the HDD connector side, during HDD ready state.
[7] Make sure the value is not less than -0.3V DC (less than -0.6V, 0.1ms) when turning on or off the power.
[8] Power supply at nominal voltage ±1%. 25°C ambient. Refer to Subsection 2.5 "Power conditions" of the SAS INTERFACE SPECIFICATION for details of idle and ready states. "Ready state" corresponds to 2.5.2 "Active state" of the SAS INTERFACE SPECIFICATION.
[9] Vibration applied to the HDD is measured at near the mounting screw hole on the frame as much as possible.
[10] At random seek write/read and default on retry setting with log sweep vibration.
[11] At power-off state after installation
[12] MTTF (Mean Time to Failure) is not a guarantee or estimate of product life; it is a statistical value related to mean failure rates for a large number of products which may not accurately reflect actual operation. Actual operating life of the product may be different from the MTTF.
・Before creating and producing designs and using, customers must also refer to and comply with the latest versions of all relevant TOSHIBA information and the instructions for the application that Product will be used with or for.