

Superior performance, reliability, and capacity for workstation, subsystem, and PC and enterprise server applications



IBM Ultrastar 18LZX and 36ZX hard disk drives

Highlights

Capacities ranging from 9.1 (low profile) to 36.7 GB, rotational speeds at 10,000 RPM, and average seek times as fast as 4.9 ms provide exceptional performance.

Industry-leading server drives with giant magnetoresistive (GMR) advanced head technology provide areal densities of 3534 Mbits/sq. in.

Buffer sizes up to 8.0 MB help provide outstanding performance, especially for large data transfers and other sequential operations.

Advanced head load/unload technology and glass substrate disks improve durability and robustness to prolong drive lifetime.

Proven drive technology

The newest members of the award-winning IBM Ultrastar* family of server disk drives feature a revolutionary design that significantly enhances both reliability and performance. As the third generation of IBM Ultrastar 10,000 RPM disk drives, the IBM Ultrastar 18LZX and 36ZX drives offer proven quality and the latest technological advances, such as shorter, lighter actuators and updated mechanics and electronics.

To achieve maximum I/O performance, these drives combine very fast seek times; extra large, multisegmented buffers; a sophisticated new command queuing system; hardware automation; and industry-leading sustained data rates. A new programmable write caching system, Cache Optimizer, further reduces data access time.

IBM Ultrastar 10,000 RPM drives employ GMR head technology to increase areal density and performance. In addition, highly efficient No-ID* sector formatting enables more data to be stored per disk.

Reliability leadership

To help ensure the maximum data protection possible, IBM Ultrastar drives include IBM-exclusive reporting tools, such as Predictive Failure Analysis* (to alert users about potential drive problems) and Drive -TIP* (to monitor drive temperatures and avoid malfunctions).

Reliability is further enhanced by the first implementation of IBM load/unload technology and glass substrate disks in IBM server drives. Load/unload provides up to 50,000 cycles, and glass substrate disks provide a more robust solution than aluminum disks at high RPMs. These technologies already have been field-proven in industry-leading IBM mobile disk drives. IBM Ultrastar drives also have an extremely high rate of data accuracy.

Outstanding environmental

Excellent environmental characteristics provide the industry's lowest power requirements for 10,000 RPM disk drives. Exclusive enhanced power save and standby modes are triggered by read/write inactivity to help minimize power use.

Support for advanced applications and interfaces

IBM Ultrastar drives provide the high data throughput required by storage management, Internet, multimedia, and other data-intensive applications. IBM also offers a comprehensive set of parallel and serial host interfaces including Ultra2 SCSI, Ultra160 SCSI, SSA, and Fibre-Channel.



IBM Ultrastar 36ZX 3.5-inch 36.7 GB high-performance disk drive

IBM Ultrastar 362X and 18LZX 3.5-inch 36.7 GB, 18.3 GB, and 9.1 GB disk drives

Configuration	DMVS Ultra2 SCSI	DMVS Ultra160 SCSI	DMVC	DMVL
Interface	Fast/Wide, SCA-2	Fast/Wide, SCA-3	SSA	FC-AL
Formatted capacity (512 bytes)	36.7/18.3/9.1 GB ¹			
Number of disks	10/5/3			
Number of heads	20/10/5			
Areal density (maximum)	3534 Mbits/sq. in.			
Recording density (maximum)	260 KBPI			
Track density	13,595 TPI			
Sector size	512 to 688 Bytes			
Channel	PRML			
Encoding method	RLL (16/17)			
Head type	Giant magnetoresistive (GMR)			
Performance	Media data rate (banded)	23.3 to 44.3 MB/sec		
	Sustained data rate	15.2 to 29.5 MB/sec		
	Interface transfer rate (max)	80 MB/sec ²	160 MB/sec	160 MB/sec ³ 200 MB/sec ⁴
	Access times (pop. avg)			
	Average read	5.4/4.9/4.9 ms		
	Track-to-track read	0.3 ms		
	Rotational speed	10,000 RPM		
	Latency (average)	3.0 ms		
	Buffer size	2 (8 optional) MB ⁵	2 (8 optional) MB ⁵	2 MB ⁵ 4 MB ⁵
Reliability	Recoverable read errors	<10 in 10E13 bits read		
	Non-recoverable read errors	<10 in 10E15 bits read		
	S.M.A.R.T./PFA/temperature sensor	Yes		
	Load/unload cycles	50,000 cycles		
Power	Startup current (max)	2.90/1.76/1.76 amps		
	Standby	12.7/9.0/8.5 watts ⁶		
	Idle (average)	17.4/11.5/10.0 watts ⁷		
	Read/write (typical)	19.3/13.0/11.5 watts ⁷		
	Power consumption efficiency index	0.0004/0.0006/0.001 watts/MB ⁸		
Dimensions	Height	41.5/25.7 mm		
	Width	101.6 mm		
	Depth	146.8 mm		
	Weight	1.14/0.71/0.70 kg		
	Mounting	Industry standard, all orientations		
Environmental characteristics	Operating	Nonoperating		
	Temperature	5° to 50° C	-40° to 65° C	
	Relative humidity (noncondensing)	5% to 90%	5% to 95%	
	Shock	10/20/20 G (2, 11 ms)	175 G (2 ms)	
	Random vibration (RMS, 5 to 500 Hz)	1.5 G	2.3 G	

¹ MB = 1,000,000 Bytes; 1 GB = 1,000,000,000 Bytes

⁴ 100 MB/sec per loop; dual loops

⁷ Add 2.5 watts for FC-AL interface

² 80 MB/sec represents Ultra2 Fast/Wide

⁵ Up to 337 KB used for firmware

⁸ Idle power dissipation/formatted capacity

³ 40 MB/sec per link with four links

⁶ Option to retract heads off disk to save power if drive not in use

For more information

Internet and e-mail:

- www.ibm.com/harddrive
- drive@us.ibm.com

IBM TECHFAX document server:

- 408-256-5418 (requires touch-tone phone)
- International callers must call from a fax machine

IBM hard disk drive product information:

- 1 888 IBM-5214 (United States)
- 507-253-4110 (outside of the United States)

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