Samsung F1 RAID Hard Disk Drive

Best-in-class Performance and Low Power

The Samsung F1R enterprise hard disk drive offers low power without sacrificing performance.

First Three-platter Drive with Terabyte Capacity for RAID Systems

Utilizing Samsung-developed perpendicular recording technology, the F1 RAID-class hard disk drive (F1R) delivers the solid performance, low power, reliability, compatibility and high capacity that the enterprise needs. The industry's first three-platter, terabyte-density drive, the F1R has many advantages over drives with four or five platters. For example, its low power requirements stem from the industry's highest-density platters: 333GB per disk.

The 7200 rpm F1R has the world's best bit density at any rotation speed, resulting in best-in-class media transfer rates and industry-leading performance. Not only are the drive's transfer rates significantly higher than other 1TB systems, but are within 20% of those found in 10K and 15K rpm drives costing considerably more.

Outstanding Reliability

A variety of features and technologies give the F1R great reliability. The drive includes a Command Completion Time Limit (CCTL) feature that works with RAID controllers for improved error handling coordination. Samsung's F1R also boasts excellent vibration tolerance as a result of a vibration sensor and advanced firmware that corrects head tracking to compensate for environmental vibration. In addition, Samsung's industry-leading NoiseGuard™ and SilentSeek™ technologies significantly reduces acoustic noise.

Samsung's expansive quality assurance process test drives longer and to more stringent metrics than usual. As a result, the F1R achieves a MTBF of 1.2 million hours in high-duty-cycle server/surveillance workloads. The drive's reliability is also enhanced by the advantage of having just three platters; reducing the number of moving parts, lowering the risk of head-to-media failures and improving airflow.

Key Features

- Advanced PMR technology
- Maximum 334GB formatted capacity per disk
- SATA 3Gbps interface
- SATA native command queuing
- CCTL for improved error handling
- Supports staggered spin up
- Hot-plug capability
- Device-initiated power management
- ATA S.M.A.R.T. compliant
- ATA automatic acoustic management feature set
- Asynchronous Signal Loss notification
- Flying-on-Demand technology
- Rotational vibration controller
- NoiseGuard and SilentSeek noise suppression

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7 year Warranty

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The Samsung F1 RAID drive is ideal for enterprise solutions calling for high-capacity, highly reliable storage such as rack-mounted storage arrays used in demanding applications.

CAPACITY		250GB	320GB	500GB	640GB	750GB	1TB
Model & Buffer	16MB	HE252HJ	HE322HJ	HE502IJ	HE642JJ		
Model & Buffer	32MB					HE753LJ	HE103UJ

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Bytes per Sector	512
Buffer DRAM Size	16/32 MB

PERFORMANCE SPECIFICATIONS

Read Seek Time (typ.)		
Track-to-Track		0.8 ms
Average		8.9 ms
Full Stroke		20 ms
Average Latency		4.17 ms
Rotational Speed[2]		7,200 RPM
Data Transfer Rate		
Media to/from Buffer (max.)		175 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typ.)		10 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15}
MTBF	1.2 M POH
Start/Stop Cycles (Ambient)	50,000
Component Design Life	5 years

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	1 disk	2.45 Bel
	2/3 disk	2.7 Bel
Performance Seek	1 disk	2.8 Bel
	2/3 disk	2.9 Bel
Quiet Seek	1 disk	2.75 Bel
	2/3 disk	2.8 Bel

PHYSICAL DIMENSIONS

Height	26.10 mm
Length	147.00 mm
Width	101.60 mm
Weight	672 grams

ENVIRONMENTAL SPECIFICATIONS

Temperature		
Operating		0-60ºC
Non-operating		40-70ºC
Thermal Gradient (max)		30ºC/hr
Humidity (non-condensing)		
Operating		5-90 %
Non operating		5-95 %
Linear Shock (1/2 sine pulse)		
Operating, 2ms		70 G
Non-operating,2ms	1 disk	350 G
	2/3 disk	300 G
Altitude (relative to sea level)		
Operating, 2ms		-1,000 to 10,000 feet
Non-operating, 2ms		-1,000 to 40,000 feet

POWER REQUIREMENTS

Voltage	+5V±5%	+12V±10%
Spin Up Current (12V)	1 disk	2.0 A
	2/3 disk	2.3 A
Seek[4]	320/250GB	5.7 W
	640/500GB	6.7 W
	1TB/750GB	7.2 W
Read/Write	320/250GB	5.3 W
	640/500GB	6.7 W
	1TB/750GB	7.8 W
Idle	320/250GB	4.5 W
	640/500GB	5.8 W
	1TB/750GB	6.7 W
Standby[5]	1 disk	1.0 W
	2/3 disk	1.2 W
Sleep[5]	1 disk	1.0 W
	2/3 disk	1.2 W

1. 1MB=1,000,000 bytes
   Accessible capacity may vary because depending on operating environment and formatting

2. 7200rpm class. Actual speed can be slightly different

3. Average value with a high-performance cover

4. Random seek with 30% duty cycle

5. Power consumption with/without slumber mode

Notes: Design and specifications are subject to change without prior notice.

7 year Warranty