

# Spinpoint F1

160GB / 250GB / 320GB / 400GB / 500GB / 750GB / 1TB

imagine a new era of Tera Byte storage

## World's First Three-disk Solution for Terabyte Storage

### Better Reliability, Less Energy Consumption than Other Options

The Samsung Spinpoint F1 is the first three-disk hard drive delivering a whopping 1TB of capacity along with sophisticated recording technology. With its compact, lightweight package and advanced design, the F1 drive offers many advantages for high-density applications compared to using two 500GB drives or a four- or five-disk solution. Compared to a five-disk 1TB solution, the F1 Series consumes 13-16% less power and offers up to 20% faster performance.

This 3.0Gbps SATA drive has a maximum of 334GB of formatted capacity per disk while also featuring Samsung's industry-leading NoiseGuard™ and SilentSeek™ technologies to eliminate acoustic noise. The Spinpoint F1 utilizes Samsung perpendicular recording technology, which helps the drive set new records in both areal density and platter capacity.

### Reliability Beats Competition

The Spinpoint F1 requires fewer components than competing solutions while delivering enhanced reliability versus a 1TB drive with four or five disks or two 500GB disks. With fewer heads and disks, the F1 statistically has a lower probability of head-disk failures. According to estimates, this Samsung drive has a 50% lower failure rate than a two-500GB-drive solution and as much as 31% fewer failures than five-platter 1TB drives.

### Special Features for High-density Applications

Servers, high-end desktops, RAID systems and DVRs are among the applications well suited to the Spinpoint F1 drive. The F1 Series is offered in desktop PC or RAID reliability. The RAID reliability mean time between failures is up to 1.2 million hours. A rotational vibration sensor enables the drive to operate more efficiently in a RAID environment.

For consumer applications, a power-saving code reduces power consumption while AV-optimized firmware cuts time delays during AV data recording. In general, the Samsung drive offers a superior combination of density, recording quality and reliability.

### Key Features

- Maximum 334GB formatted capacity each in 3 disks
- SATA 3.0Gbps interface support
- SATA native command queuing
- 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
- PMR technology
- Flying-on-Demand technology
- Rotational vibration controller
- NoiseGuard™ and SilentSeek™ noise suppression



# Spinpoint F1

- Desktop Edition -

imagine a new era of Tera Byte storage



## Special Features for CE Edition

- Power Saving Code boosting the efficiency of power consumption in CE applications
- AV Optimized firmware feature set reducing time delay while Audio / Visual data proceeding
- SilentSeek™ and NoiseGuard™ eliminating any source of acoustic noise

## Special Features for RaidEdition

- 1.2M MTBF ensuring better reliability and long lasting operation : comparing to 0.6M MTBF
- Rotational Vibration Sensor defending data against internal and external impacts

Capacity <sup>1</sup>		160GB	250GB	320GB	400GB	500GB	750GB	1TB
Model & Buffer	8MB	HD161GJ	HD251HJ	HD321HJ	HD401IJ	HD501IJ		
	16MB	HD162GJ	HD252HJ	HD322HJ	HD402IJ	HD502IJ	HD752LJ	HD102UJ
	32MB						HD753LJ	HD103UJ

### DRIVE CONFIGURATION

Interface	Serial ATA 3.0Gbps
Rotational Speed <sup>2</sup>	7,200 rpm
Buffer DRAM Size	8 / 16 / 32 MB
Sector Size	512 bytes

### PERFORMANCE SPECIFICATIONS

<b>Read Seek Time (typical)</b>	
-Average	8.9 ms
<b>Average Latency</b>	
	4.17 ms
<b>Data Transfer Rate</b>	
-Media to/from Buffer (max.)	135 MB/sec
-Buffer to/from Host (max.)	300 MB/sec
<b>Drive Ready Time (typical)</b>	
	10 sec

### RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10 <sup>14</sup> bits
Start/Stop Cycles (Ambient)	50,000

### ACOUSTICS (AVERAGE SOUND POWER)<sup>3</sup>

Idle	160-320 GB	2.35 Bel
	400-1000 GB	2.70 Bel
Random Read/Write	160-320 GB	2.70 Bel
	400-1000 GB	2.90 Bel

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



### ENVIRONMENTAL SPECIFICATIONS

<b>Temperature</b>	
-Operating	0~60°C
-Non-operating	-40 ~ 70°C
-Thermal Gradient (max.)	20°C/hr
<b>Humidity (non-condensing)</b>	
-Operating	5 ~ 90 %
-Non-operating	5 ~ 95 %
<b>Linear Shock (1/2 sine pulse)</b>	
-Operating, 2ms	70 G
-Non-operating, 2ms	160-320 GB : 350 G 400-1000 GB : 300 G
<b>Altitude (relative to sea level)</b>	
-Operating	-300 to 3,000 m
-Non-operating	-300 to 12,000 m

### POWER REQUIREMENTS

Voltage	+5V±5%	+12V±10%	
	160 GB	250/320 GB	400/500 GB
Spin Up Current (12V)	2.0 A	2.3 A	2.4 A
Seek <sup>4</sup> (typical)	9.5 W	9.9 W	10.6 W
Read/Write (typical)	8.0 W	8.7 W	9.5 W
Idle (typical)	6.5 W	7.6 W	8.2 W
Standby <sup>5</sup> (typical)	0.5/1.0 W	0.7/1.2 W	0.7/1.2 W
Sleep <sup>5</sup> (typical)	0.5/1.0 W	0.7/1.2 W	0.7/1.2 W

### PHYSICAL DIMENSION

Height	25.4 mm	
Width	101.6 mm	
Depth	146.04 mm	
Weight	160/250/320 GB	512.56 g
	400/500 GB	612.35 g
	7500/1000 GB	639.57 g

1. 1MB=1,000,000 Bytes 1GB=1,000,000,000 Bytes  
1TB=1,000,000,000,000 Bytes

\*Accessible capacity may vary as some OS uses binary numbering system for reported capacity

2. 7,200 RPM class. Actual speed can be different a little
3. Averaged value with a high performance cover
4. Random seek with 30% duty cycle
5. Power consumption values are with / without slumber mode.



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# Spinpoint F1

320GB / 500GB / 750GB / 1TB

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## World's First Three-disk Solution for Terabyte Storage

### Better Reliability, Less Energy Consumption than Other Options

The Samsung Spinpoint F1 is the first three-disk hard drive delivering a whopping 1TB of capacity along with sophisticated recording technology. With its compact, lightweight package and advanced design, the F1 drive offers many advantages for high-density applications compared to using two 500GB drives or a four- or five-disk solution. Compared to a five-disk 1TB solution, the F1 Series consumes 13-16% less power and offers up to 20% faster performance.

This 3.0Gbps SATA drive has a maximum of 334GB of formatted capacity per disk while also featuring Samsung's industry-leading NoiseGuard™ and SilentSeek™ technologies to eliminate acoustic noise. The Spinpoint F1 utilizes Samsung perpendicular recording technology, which helps the drive set new records in both areal density and platter capacity.

### Reliability Beats Competition

The Spinpoint F1 requires fewer components than competing solutions while delivering enhanced reliability versus a 1TB drive with four or five disks or two 500GB disks. With fewer heads and disks, the F1 statistically has a lower probability of head-disk failures. According to estimates, this Samsung drive has a 50% lower failure rate than a two-500GB-drive solution and as much as 31% fewer failures than five-platter 1TB drives.

### Special Features for High-density Applications

Servers, high-end desktops, RAID systems and DVRs are among the applications well suited to the Spinpoint F1 drive. The F1 Series is offered in desktop PC or RAID reliability. The RAID reliability mean time between failures is up to 1.2 million hours. A rotational vibration sensor enables the drive to operate more efficiently in a RAID environment.

For consumer applications, a power-saving code reduces power consumption while AV-optimized firmware cuts time delays during AV data recording. In general, the Samsung drive offers a superior combination of density, recording quality and reliability.

### Key Features

- Maximum 334GB formatted capacity each in 3 disks
- SATA 3.0Gbps interface support
- SATA native command queuing
- 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
- PMR technology
- Flying-on-Demand technology
- Rotational vibration controller
- NoiseGuard™ and SilentSeek™ noise suppression



# Spinpoint F1



- RAID Edition -

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## Special Features for CE Edition

- Power Saving Code boosting the efficiency of power consumption in CE applications
- AV Optimized firmware feature set reducing time delay while Audio / Visual data proceeding
- SilentSeek™ and NoiseGuard™ eliminating any source of acoustic noise

## Special Features for RaidEdition

- 1.2M MTBF ensuring better reliability and long lasting operation : comparing to 0.6M MTBF
- Rotational Vibration Sensor defending data against internal and external impacts

Capacity <sup>1</sup>		320GB	500GB	750GB	1TB
Model & Buffer	16MB 32MB	HE322HJ	HE502IJ	HE753LJ	HE103UJ

### DRIVE CONFIGURATION

Interface	Serial ATA 3.0Gbps
Rotational Speed <sup>2</sup>	7,200 rpm
Buffer DRAM Size	16 / 32 MB
Sector size	512bytes

### PERFORMANCE SPECIFICATIONS

<b>Read Seek Time (typical)</b>	
-Average	8.9 ms
<b>Average Latency</b>	4.17 ms
<b>Data Transfer Rate</b>	
-Media to/from Buffer (max.)	135 MB/sec
-Buffer to/from Host (max.)	300 MB/sec
<b>Drive Ready Time (typical)</b>	10 sec

### RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10 <sup>14</sup> bits
MTBF	1,200,000 POH
Start/Stop Cycles (Ambient)	50,000

### ACOUSTICS (AVERAGE SOUND POWER)<sup>3</sup>

Idle	320 GB	2.35 Bel
	500/750/1000 GB	2.70 Bel
Random Read/Write	320 GB	2.70 Bel
	500/750/1000 GB	2.90 Bel

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



### ENVIRONMENTAL SPECIFICATIONS

<b>Temperature</b>	
-Operating	0~60°C
-Non-operating	-40 ~ 70°C
-Thermal Gradient (max.)	20°C/hr
<b>Humidity (non-condensing)</b>	
-Operating	5 ~ 90 %
-Non-operating	5 ~ 95 %
<b>Linear Shock (1/2 sine pulse)</b>	
-Operating, 2ms	70 G
-Non-operating, 2ms	320 GB 350 G 500/750/1000 GB 300 G
<b>Altitude (relative to sea level)</b>	
-Operating	-300 to 3,000 m
-Non-operating	-300 to 12,000 m

### POWER REQUIREMENTS

	+5V±5%		+12V±10%
	320 GB	500 GB	750/1000GB
Spin Up Current (12V)	2.0 A	2.3 A	2.4 A
Seek <sup>4</sup> (typical)	9.5 W	9.9 W	10.6 W
Read/Write (typical)	8.0 W	8.7 W	9.5 W
Idle (typical)	6.5 W	7.6 W	8.2 W
Standby <sup>5</sup> (typical)	0.5/1.0 W	0.7/1.2 W	0.7/1.2 W
Sleep <sup>5</sup> (typical)	0.5/1.0 W	0.7/1.2 W	0.7/1.2 W

### PHYSICAL DIMENSION

Height	25.4mm	
Width	101.6mm	
Depth	146.04mm	
Weight	320 GB	512.56g
	500 GB	612.35g
	750/1000 GB	639.57g

1. 1MB=1,000,000 Bytes 1GB=1,000,000,000 Bytes  
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# Spinpoint F1

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## Special Features for CE Edition

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- Rotational Vibration Sensor defending data against internal and external impacts

Capacity <sup>1</sup>		250GB	320GB	400GB	500GB	750GB	1TB
Model & Buffer	8MB	HA251HJ	HA321HJ	HA401IJ	HA501IJ	HA751LJ	HA101UJ

### DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Rotational Speed <sup>2</sup>	7,200 rpm
Buffer DRAM Size	8 MB
Sector size	512 bytes

### PERFORMANCE SPECIFICATIONS

<b>Read Seek Time (typical)</b>	
-Track to Track	0.8 ms
-Average	13 ms
-Full Stroke	20 ms
<b>Average Latency</b>	4.17 ms
<b>Data Transfer Rate</b>	
-Media to/from Buffer (max.)	135 MB/sec
-Buffer to/from Host (max.)	300 MB/sec
<b>Drive Ready Time (typical)</b>	12 sec

### RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10 <sup>14</sup> bits
Start/Stop Cycles (Ambient)	50,000

### ACOUSTICS (AVERAGE SOUND POWER)<sup>3</sup>

Idle	160-320 GB	2.35 Bel
	400-1000 GB	2.70 Bel
Random Read/Write	160-320 GB	2.70 Bel
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<b>Temperature</b>	
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-Thermal Gradient (max.)	20°C/hr
<b>Humidity (non-condensing)</b>	
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<b>Linear Shock (1/2 sine pulse)</b>	
-Operating, 2ms	70 G
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-Operating	-300 to 3,000 m
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### POWER REQUIREMENTS

Voltage	+5V±5%	+12V±10%	
	250/320 GB	400/500 GB	750/1000GB
Spin Up Current (12V)	2.0 A	2.0 A	2.0 A
Seek <sup>4</sup> (typical)	9.5 W	9.9 W	10.6 W
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Sleep <sup>5</sup> (typical)	0.5/1.0 W	0.7/1.2 W	0.7/1.2 W

### PHYSICAL DIMENSION

Height	25.4mm	
Width	101.6mm	
Depth	146.04mm	
Weight	160/250/320GB	512.56g
	400/500 GB	612.35g
	750/1000 GB	639.57g

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