

# Travelstar® Z5K1000

# 2.5-Inch Mobile 5400 RPM 7.0mm Hard Disk Drives

# **Highlights**

- Up to 1TB<sup>1</sup> of capacity
- Advanced Format, 512-byte emulation
- · 6Gb/s SATA interface
- Dual-stage Actuator (DSA)
- · Low power consumption
- Halogen-free for eco-friendly design
- · Self-encrypting models for data security

# **Applications/Environments**

- Notebook and ultra-portable PCs
- External storage

# Industry-leading Capacity in a 7.0mm Mobile Form Factor

Travelstar® Z5K1000 is the third generation 7.0mm, 5400 RPM, 2.5-inch hard drive from HGST, offering 750GB and 1TB capacities. This newest addition to the Travelstar family achieves the industry's highest 7.0mm capacity through an innovative two-disk design in a form factor that typically accommodates only one disk. The Z5K1000 is designed to expand the storage capacity for slim-design notebook PCs, which has been limited to 500GB based on past one-disk design capacities. HGST 7.0mm drives may also be used as direct replacements for standard 9.5mm HDDs in notebook PCs, especially slim-design, and external storage with thinner and more robust device designs. This new drive also leverages Advanced Format, which increases the physical sector size on hard drives from 512byte to 4096(4K) bytes to increase drive capacities and improve error correction capabilities.

The Travelstar Z5K1000 continues to demonstrate HGST's ecological leadership with its halogen-free design and power-efficient operation, and carries the EcoTrac classification. Travelstar Z5K1000 delivers the highest-available mobile capacity with excellent performance to meet the needs of consumers and commercial users in an eco-friendly, rugged design.

# **Encryption Option**

Travelstar Z5K1000 is the seventh generation self-encrypting drive (SED) to feature HGST's Bulk Data Encryption. The SED encrypts data using protected keys in real time, providing users with the highest level of data protection available. It also speeds and simplifies drive re-purposing. By deleting the encryption key, the data on the drive is rendered unreadable, thereby eliminating the need for time-consuming data-overwrite. For information about the SED models designed to the Trusted Computing Group (TCG) Opal Storage Security specification, please contact your HGST representative.

## Features and Benefits

	Feature / Function	Benefits
Capacity	Up to 1TB storage	Up to 250 hours of high-definition video, 1000 hours of standard video, 350 movies, 250,000 4-min songs or 500 games *
Power	1.6W read/write power 0.5W low power idle	Low energy use and long battery life for more "unplugged" notebook time
Reliability	400G operating shock 1000G non-operating shock	Best protection against bumps and rough handling
	Thermal Fly-height Control (TFC)	Better error rate for improved reliability
	Dual-stage Actuator (DSA) technology	Enhanced tracking accuracy in high shock or vibration environments
Performance	Up to 1061Mb/s media transfer rate	Best-of-breed 5400 RPM application performance in PCMark 7 and PCMark Vantage testing
Acoustics	Quiet acoustics	Richer audio-listening experience for music, movies and games
Interface	SATA 6Gb/s	Higher data throughput
Security Option	Bulk Data Encryption and TCG Opal models	Helps guard against data theft

<sup>\*</sup> Actual storage may vary depending on the compression rate applied. Capacities may not be combined.









# **HGST Quality and Service**

HGST's mobile hard drives are designed to the highest quality standards and contain field-proven components. HGST provides worldwide technical support and integration services to enable global customers to bring their products to market quickly.

# How to read the Travelstar model number

HTS541010A7E630 = 1TB, SATA 6Gb/s

H = HGST

Т = Travelstar

S = Standard

54 = 5400 RPM

10 = Full capacity - 1TB

= Capacity this model, 10 = 1TB 10

(75 = 750GB)Generation code

7mm z-height

E6 = SATA interface

6Gb/s with 512 emulation

= 32MB cache

3

0 No encryption (1 = Bulk data encryption,

5 = TCG Opal Encryption)

## Information and Technical Support

www.hgst.com (Main Web site)

www.hgst.com/partners (Partner Web site)

### **North America**

support\_usa@hgst.com

Toll free: 1 888 426-5214, Direct: 1 408 717-8087

support\_ap@hgst.com / 65 6840 9595

### **EMEA** and UK

support\_uk@hgst.com / 44 20 7133 0032

support\_uk@hgst.com / 49 6929 993601

# **Program Support**

Partners First Program channelpartners@hgst.com

# Specifications

HTSS41010ATE83	Specifications			
Interface	Models	HTS541010A7E631 HTS541010A7E635 HTS541075A7E630 HTS541075A7E631		
Capacity (GB)	Configuration			
Sector size (bytes) <sup>2</sup>   512e	Interface	SATA 6Gb/s		
Areal density (max, Gbit/sq.in.)         648           Performance         32           Data buffer (MB)³         32           Rotational speed (RPM)         5400           Latency average (ms)         5.5           Media transfer rate (max, Mbits/sec)         1061           Interface transfer rate (MB/sec)         600           Seek time Average (typical) ms (read)*         13           Track to track (typical) ms (read)         1           Full stroke (typical) ms (read)         25           Reliability         55           Load/Unload cycle         600,000           Power         600,000           Power         8           Requirement         +5VDC (+5%)           Dissipation (typical) Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance (alle, (W, average)         0.8           Low power idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.5           Standby, (W, average)         0.5           Steep         0.1           Physical size           Height (max, mm)	Capacity (GB) <sup>1</sup>	1TB / 750		
Performance           Data buffer (MB)³         32           Rotational speed (RPM)         5400           Latency average (ms)         5.5           Media transfer rate (max, Mbits/sec)         1061           Interface transfer rate (MB/sec)         600           Seek time Average (typical) ms (read)**         13           Track to track (typical) ms (read)         1           Full stroke (typical) ms (read)         25           Reliability         600,000           Power         ***           Requirement         +5VDC (+5%)           Dissipation (typical) Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance idle, (W, average)         1.5           Active idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.5           Standby, (W, average)         0.5           Steep         0.1           Physical size         ***           Height (max, mm)         70           Dimensions (width x depth, mm)         70 x 100           Weight (max, g)         95           Environmental (	Sector size (bytes) <sup>2</sup>	512e		
Data buffer (MB) <sup>3</sup>   32     Rotational speed (RPM)   5400     Latency average (ms)   5.5     Media transfer rate (max, Mbits/sec)   1061     Interface transfer rate (MB/sec)   600     Seek time	Areal density (max, Gbit/sq.in.)	648		
Rotational speed (RPM)   5400	Performance			
Latency average (ms)   5.5     Media transfer rate (max, Mbits/sec)   1061     Interface transfer rate (MB/sec)   600     Seek time	Data buffer (MB) <sup>3</sup>	32		
Media transfer rate (max, Mbits/sec)         1061           Interface transfer rate (MB/sec)         600           Seek time         Average (typical) ms (read) <sup>4</sup> 13           Track to track (typical) ms (read)         1           Full stroke (typical) ms (read)         25           Reliability         600,000           Power         8equirement           Requirement         +5VDC (+-5%)           Dissipation (typical)         5tartup (W, peak, max)           Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.5           Standby, (W, average)         0.2           Sleep         0.1           Physical size         Height (max, mm)         70           Height (max, g)         95           Environmental (operating)           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         -6° to 60° C           Environmental (non-operating)         500 C           Shock (half-sine wave)         400 G/2ms, 225G/1ms	Rotational speed (RPM)	5400		
Interface transfer rate (MB/sec) 600   Seek time	Latency average (ms)	5.5		
Seek time         Average (typical) ms (read) <sup>4</sup> 13           Track to track (typical) ms (read)         1           Full stroke (typical) ms (read)         25           Reliability         500,000           Load/Unload cycle         600,000           Power         8           Requirement         +5VDC (+-5%)           Dissipation (typical)         4.5           Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.2           Sleep         0.1           Physical size         14eight (max, mm)           Height (max, g)         95           Environmental (operating)           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         0° to 60° C           Environmental (non-operating)         Shock (half-sine wave)         1000G/1 ms           Ambient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         2.1	Media transfer rate (max, Mbits/sec)	1061		
Average (typical) ms (read)  Track to track (typical) ms (read)  Full stroke (typical) ms (read)  Event to track (typical)  Even to track (typical)  Event to track (typical)  Event to track (typical)  Event to track (typical)  Event to track (typical)  Even to track (typical)	Interface transfer rate (MB/sec)	600		
Full stroke (typical) ms (read)         25           Reliability         600,000           Power         600,000           Requirement         +5VDC (+-5%)           Dissipation (typical) Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance idle, (W, average)         1.5           Active idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.2           Sleep         0.1           Physical size         Height (max, mm)           Height (max, mm)         70 x 100           Weight (max, g)         95           Environmental (operating)           Shock (half-sine wave)         400G/2ms, 225G/Ims           Ambient temperature         0° to 60° C           Environmental (non-operating)           Shock (half-sine wave)         1000G/1 ms           Ambient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         2.1		13		
Reliability	Track to track (typical) ms (read)	1		
Load/Unload cycle   600,000	Full stroke (typical) ms (read)	25		
Power         +5VDC (+-5%)           Requirement         +5VDC (+-5%)           Dissipation (typical) Startup (W, peak, max)         4.5           Seek, (W, average)         1.8           Read/Write, (W, average)         1.6           Performance idle, (W, average)         0.8           Low power idle, (W, average)         0.5           Standby, (W, average)         0.2           Sleep         0.1           Physical size           Height (max, mm)         7.0           Dimensions (width x depth, mm)         70 x 100           Weight (max, g)         95           Environmental (operating)           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         0° to 60° C           Environmental (non-operating)           Shock (half-sine wave)         1000G/1 ms           Ambient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         Idle (Bels, typical)         2.1	Reliability			
Requirement	Load/Unload cycle	600,000		
Dissipation (typical)       4.5         Seek, (W, average)       1.8         Read/Write, (W, average)       1.6         Performance idle, (W, average)       1.5         Active idle, (W, average)       0.8         Low power idle, (W, average)       0.5         Standby, (W, average)       0.2         Sleep       0.1         Physical size         Height (max, mm)       7.0         Dimensions (width x depth, mm)       70 x 100         Weight (max, g)       95         Environmental (operating)         Shock (half-sine wave)       400G/2ms, 225G/1ms         Ambient temperature       0° to 60° C         Environmental (non-operating)         Shock (half-sine wave)       1000G/1 ms         Ambient temperature       -40° to 65° C         Acoustics (A-weighted sound power)       1dle (Bels, typical)	Power			
Startup (W, peak, max)       4.5         Seek, (W, average)       1.8         Read/Write, (W, average)       1.6         Performance idle, (W, average)       0.8         Low power idle, (W, average)       0.5         Standby, (W, average)       0.2         Sleep       0.1         Physical size         Height (max, mm)       7.0         Dimensions (width x depth, mm)       70 x 100         Weight (max, g)       95         Environmental (operating)         Shock (half-sine wave)       400G/2ms, 225G/1ms         Ambient temperature       0° to 60° C         Environmental (non-operating)         Shock (half-sine wave)       1000G/1 ms         Ambient temperature       -40° to 65° C         Acoustics (A-weighted sound power)       1dle (Bels, typical)	Requirement	+5VDC (+-5%)		
Read/Write, (W, average)   1.6     Performance idle, (W, average)   1.5     Active idle, (W, average)   0.8     Low power idle, (W, average)   0.5     Standby, (W, average)   0.2     Sleep   0.1     Physical size     Height (max, mm)   7.0     Dimensions (width x depth, mm)   70 x 100     Weight (max, g)   95     Environmental (operating)     Shock (half-sine wave)   400G/2ms, 225G/1ms     Ambient temperature   0° to 60° C     Environmental (non-operating)     Shock (half-sine wave)   1000G/1 ms     Ambient temperature   -40° to 65° C     Acoustics (A-weighted sound power)     Idle (Bels, typical)   2.1		4.5		
Performance idle, (W, average)   1.5     Active idle, (W, average)   0.8     Low power idle, (W, average)   0.5     Standby, (W, average)   0.2     Sleep   0.1     Physical size     Height (max, mm)   7.0     Dimensions (width x depth, mm)   70 x 100     Weight (max, g)   95     Environmental (operating)     Shock (half-sine wave)   400G/2ms, 225G/1ms     Ambient temperature   0° to 60° C     Environmental (non-operating)     Shock (half-sine wave)   1000G/1 ms     Ambient temperature   -40° to 65° C     Acoustics (A-weighted sound power)     Idle (Bels, typical)   2.1	Seek, (W, average)	1.8		
Active idle, (W, average) 0.8  Low power idle, (W, average) 0.5  Standby, (W, average) 0.2  Sleep 0.1  Physical size  Height (max, mm) 7.0  Dimensions (width x depth, mm) 70 x 100  Weight (max, g) 95  Environmental (operating)  Shock (half-sine wave) 400G/2ms, 225G/1ms  Ambient temperature 0° to 60° C  Environmental (non-operating)  Shock (half-sine wave) 1000G/1 ms  Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1	Read/Write, (W, average)	1.6		
Low power idle, (W, average)   0.5     Standby, (W, average)   0.2     Sleep   0.1     Physical size     Height (max, mm)   7.0     Dimensions (width x depth, mm)   70 x 100     Weight (max, g)   95     Environmental (operating)     Shock (half-sine wave)   400G/2ms, 225G/1ms     Ambient temperature   0° to 60° C     Environmental (non-operating)     Shock (half-sine wave)   1000G/1 ms     Ambient temperature   -40° to 65° C     Acoustics (A-weighted sound power)     Idle (Bels, typical)   2.1	Performance idle, (W, average)	1.5		
Standby, (W, average)   0.2     Sleep	Active idle, (W, average)	0.8		
Sleep   0.1	Low power idle, (W, average)	0.5		
Physical size           Height (max, mm)         7.0           Dimensions (width x depth, mm)         70 x 100           Weight (max, g)         95           Environmental (operating)         400G/2ms, 225G/1ms           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         0° to 60° C           Environmental (non-operating)         5hock (half-sine wave)           Ahoient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         1dle (Bels, typical)           Idle (Bels, typical)         2.1	Standby, (W, average)	0.2		
Height (max, mm)   7.0     Dimensions (width x depth, mm)   70 x 100     Weight (max, g)   95     Environmental (operating)     Shock (half-sine wave)   400G/2ms, 225G/1ms     Ambient temperature   0° to 60° C     Environmental (non-operating)     Shock (half-sine wave)   1000G/1 ms     Ambient temperature   -40° to 65° C     Acoustics (A-weighted sound power)     Idle (Bels, typical)   2.1	Sleep	0.1		
Dimensions (width x depth, mm)         70 x 100           Weight (max, g)         95           Environmental (operating)         400G/2ms, 225G/1ms           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         0° to 60° C           Environmental (non-operating)         Shock (half-sine wave)           Shock (half-sine wave)         1000G/1 ms           Ambient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         Idle (Bels, typical)	Physical size			
Weight (max, g)         95           Environmental (operating)         400G/2ms, 225G/1ms           Shock (half-sine wave)         400G/2ms, 225G/1ms           Ambient temperature         0° to 60° C           Environmental (non-operating)         Shock (half-sine wave)           Shock (half-sine wave)         1000G/1 ms           Ambient temperature         -40° to 65° C           Acoustics (A-weighted sound power)         Idle (Bels, typical)	Height (max, mm)	7.0		
Environmental (operating)  Shock (half-sine wave) 400G/2ms, 225G/1ms  Ambient temperature 0° to 60° C  Environmental (non-operating)  Shock (half-sine wave) 1000G/1 ms  Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1	Dimensions (width x depth, mm)	70 x 100		
Shock (half-sine wave)  Ambient temperature  O° to 60° C  Environmental (non-operating)  Shock (half-sine wave)  Ambient temperature  -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical)  400G/2ms, 225G/1ms  1000G/1 ms  -40° to 65° C  Acoustics (A-weighted sound power)  2.1		95		
Ambient temperature 0° to 60° C  Environmental (non-operating)  Shock (half-sine wave) 1000G/1 ms  Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1	Environmental (operating)			
Environmental (non-operating)  Shock (half-sine wave) 1000G/1 ms  Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1	Shock (half-sine wave)	400G/2ms, 225G/1ms		
Shock (half-sine wave) 1000G/1 ms  Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1	Ambient temperature	0° to 60° C		
Ambient temperature -40° to 65° C  Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1				
Acoustics (A-weighted sound power)  Idle (Bels, typical) 2.1				
Idle (Bels, typical) 2.1	<u>'</u>	-40° to 65° C		
21	Acoustics (A-weighted sound power)			
Seek (Bels, typical) 2.2				
	Seek (Bels, typical)	2.2		



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Please visit the Support section of our website, www.hast.com/support, for additional information on product specifications. Photographs may show design models.

<sup>1.</sup> One MB is equal to one million bytes, one GB is equal to one billion. bytes and one TB equals 1,000GB (one trillion bytes) when referring to hard drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the hard drive, the computer's operating system, and other factors.

2 Advanced Format drive: 4K physical sectors with 512 byte emulation 3 Portion of buffer used for firmware

<sup>4</sup> Excludes command overhead