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HDD

MQ04AB SERIES
Client HDD

Toshiba's MQ04AB Series 5,400 rpm HDDs deliver up to 2TB[1] of data storage capacity in 2.5-inch form factor. It is suitable for ultra-portable laptop and notebook PCs, as well as for use in slim-line "all-in-one" desktop PCs. Other uses include high-end multimedia devices where low-power and mobile-class robustness helps to achieve platform design requirements. The MQ04AB series leverage shock sensors to protect the drive from excessive shock events. The MQ04AB Series' quiet operation makes it an excellent storage solution for laptops, slim-line desktops, and applications where capacity, power-profile, and reliability are critical.

Product image may represent a design model.

KEY FEATURES

- Up to 2 TB of Storage Capacity
- 2.5-inch Slim Form Factor
- 5,400 rpm performance
- SATA up to 6.0 Gbit/s[3]
- Advanced Format (AF) 512e Sector Technology
- MTTF[4] of 600,000 hours
- Low Power Consumption Versus traditional 3.5-inch desktop HDDs
- Quiet Operation Versus traditional 3.5-inch desktop HDDs
- Improved Performance with Native Command Queue (NCQ)
- Optimize HDD Health with SMART

APPLICATIONS

- Ultrathin Notebooks, portable PCs
- Slim-line desktop and "all-in-one" PCs
- High-End Multimedia Devices

SPECIFICATIONS

Item		MQ04ABD200	MQ04ABF100
Interface		SATA (1.5 Gbit/s, 3.0 Gbit/s, 6.0 Gbit/s)	
Formatted Capacity		2 TB	1 TB
Performance	Interface Speed	6.0 Gbit/s Max	
	Rotation Speed	5,400 rpm	
	Average Latency Time	5.56 ms	
	Buffer Size	128 MiB[5]	
Logical Data Block Length		HOST: 512 B, DISK: 4,096 B[6]	
Supply Voltage	Allowable Voltage	5 V[7] ± 5%	
Power Consumption	Read / Write[8]	1.65 W Typ.	
	Low Power Idle[9]	0.60 W Typ.	
Acoustics (Sound Power)	For idle mode (Spindle is rotating)	23 dB Ave.	19 dB Ave.
	Seek	24 dB Ave.	21 dB Ave.

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❯ ENVIRONMENTAL LIMITS

Item		Specification
Temperature	Operating	0 °C to 60 °C
	Non-Operating	- 40 °C to 65 °C
Humidity	Operating	8 % to 90 % R.H. (No condensation)
	Non-Operating	8 % to 90 % R.H. (No condensation)
Shock	Operating	3,920 m/s^2 { 400 G } / 2 ms duration
	Non-Operating	9,800 m/s^2 { 1,000 G } / 2 ms duration
Vibration	Operating	9.8 m/s^2 { 1 G } (5 to 500 Hz)
	Non-Operating	49 m/s^2 { 5 G } (15 to 500 Hz)
Altitude	Operating	- 300 m to 3,000 m
	Non-Operating	- 300 m to 12,000 m

❯ RELIABILITY

Item	Specification
MTTF	600,000 h
Non-recoverable Error Rate	1 error per 10^{14} bits read
Load / Unload	600,000 times

❯ MODEL NUMBERS

Model Number	Interface	Formatted Capacity	Sector Format
MQ04ABD200	SATA-3.3	2 TB	HOST: 512 B, DISK: 4,096 B
MQ04ABF100	SATA-3.3	1 TB	HOST: 512 B, DISK: 4,096 B

[1] Definition of capacity: Toshiba defines 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.
[2] "2.5-inch" and "3.5-inch" mean the form factor of HDDs or SSDs. They do not indicate drive's physical size.
[3] Read and write speed may vary depending on the host device, read and write conditions, and file size.
[4] 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.
[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] Read–modify-write is supported.
[7] When DC power is turned off, +5 V voltage must not be lower than 0 V.
[8] The read/write current is specified based on three operations of 63 sector read/write per 100 ms.
[9] The values are based on using S-ATA power management features. The Partial mode is used for the idle modes power consumption measurements and the Slumber mode is used for Standby and Sleep modes power consumption measurements. Motor is rotating at normal speed but heads are unloaded on the ramp.

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2) Names and Contents of Hazardous Substances or Elements in Products

产品中有害物质的名称及含量

部件名称	有害物质					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr(VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
HDD(硬盘驱动器)	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

中华人民共和国环保使用期限

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BSMI (Bureau of Standards, Metrology and Inspection)	Taiwan
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ACMA (Australian Communications and Media Authority)	Australia

(Note 1) Marks of KC	
Made in Philippines	KC 1. 기기의 명칭(모델명) : MQ04ABD200 2. 인증번호 : MSIP-REM-TSD-MQ04ABD200 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2017-02 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 필리핀 KC 1. 기기의 명칭(모델명) : MQ04ABF100 2. 인증번호 : MSIP-REM-TSD-MQ04ABF100 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2016-05 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 필리핀
Made in China	KC 1. 기기의 명칭(모델명) : MQ04ABD200 2. 인증번호 : MSIP-REM-TSD-MQ04ABD200 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2017-02 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 중국 KC 1. 기기의 명칭(모델명) : MQ04ABF100 2. 인증번호 : MSIP-REM-TSD-MQ04ABF100 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2016-05 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 중국

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MECHANICAL SPECIFICATIONS

Item	MQ04ABD200	MQ04ABF100
Width	69.85 mm	
Height	9.5 mm	7.0 mm
Length	100.0 mm	
Weight	117 g Max	92 g Max

Figure.1   MQ04ABD200

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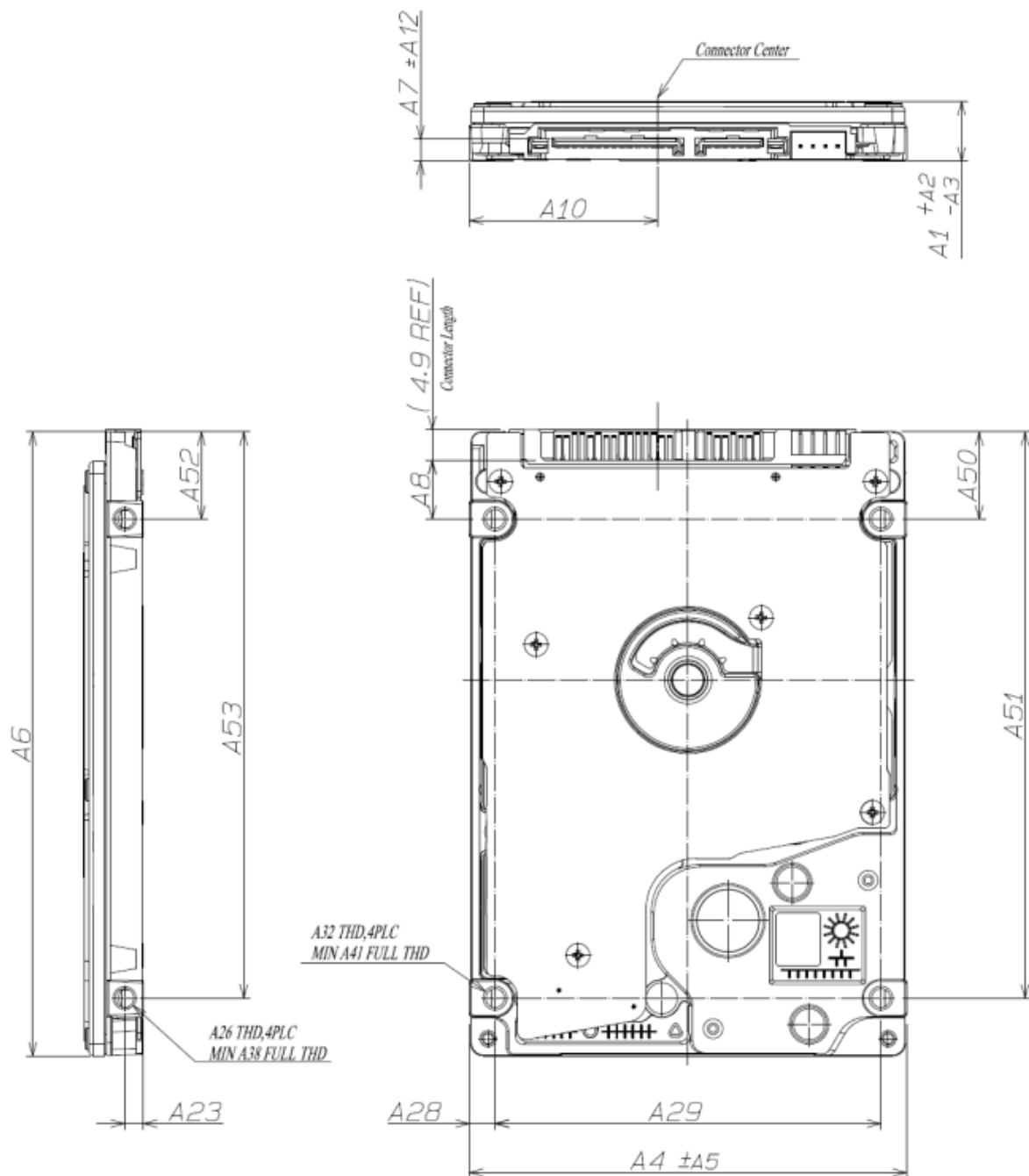Client HDD MQ04AB Series Product Manual
Rev. 01: Feb, 2018

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Table.1　MQ04ABD200

Dimension	SFF-8200 Rev3.3[10] SFF-8201 Rev3.3 SFF-8223 Rev2.7		Toshiba S-ATA Model (Differences only)	
	mm	{ Inch }	mm	{ Inch }
A1	9.5	0.374		
A2	0.20	0.008		
A3	0.20	0.008		
A4	69.85	2.750		
A5	0.25	0.010		
A6[11]	100.45 Max	3.955 Max	100.00 $\pm$0.41	3.937 $\pm$0.016
A7	3.50	0.137		
A8	9.40	0.370	9.40 $\pm$0.51	0.370 $\pm$0.020
A10	—	—	30.125 $\pm$0.28	1.186 $\pm$0.011
A12	0.38	0.015		
A23	3.00	0.118	3.00 $\pm$0.20	0.118$\pm$0.007
A28	4.07	0.160	4.07 $+$0.295 -0.305	0.160 +0.012 -0.012
A29	61.72	2.430	61.72 $\pm$0.25	2.430 $\pm$0.010
A50[11]	14.00	0.551	14.00 $\pm$0.25	0.551 $\pm$0.010
A51[11]	90.60	3.576	90.60 $\pm$0.30	3.567 $\pm$0.012
A52[11]	14.00	0.551	14.00 $\pm$0.25	0.551 $\pm$0.010
A53[11]	90.60	3.567	90.60 $\pm$0.30	3.567 $\pm$0.012

[10] SFF-8200: Small Form Factor Standard.
[11] PCA, Connector not included
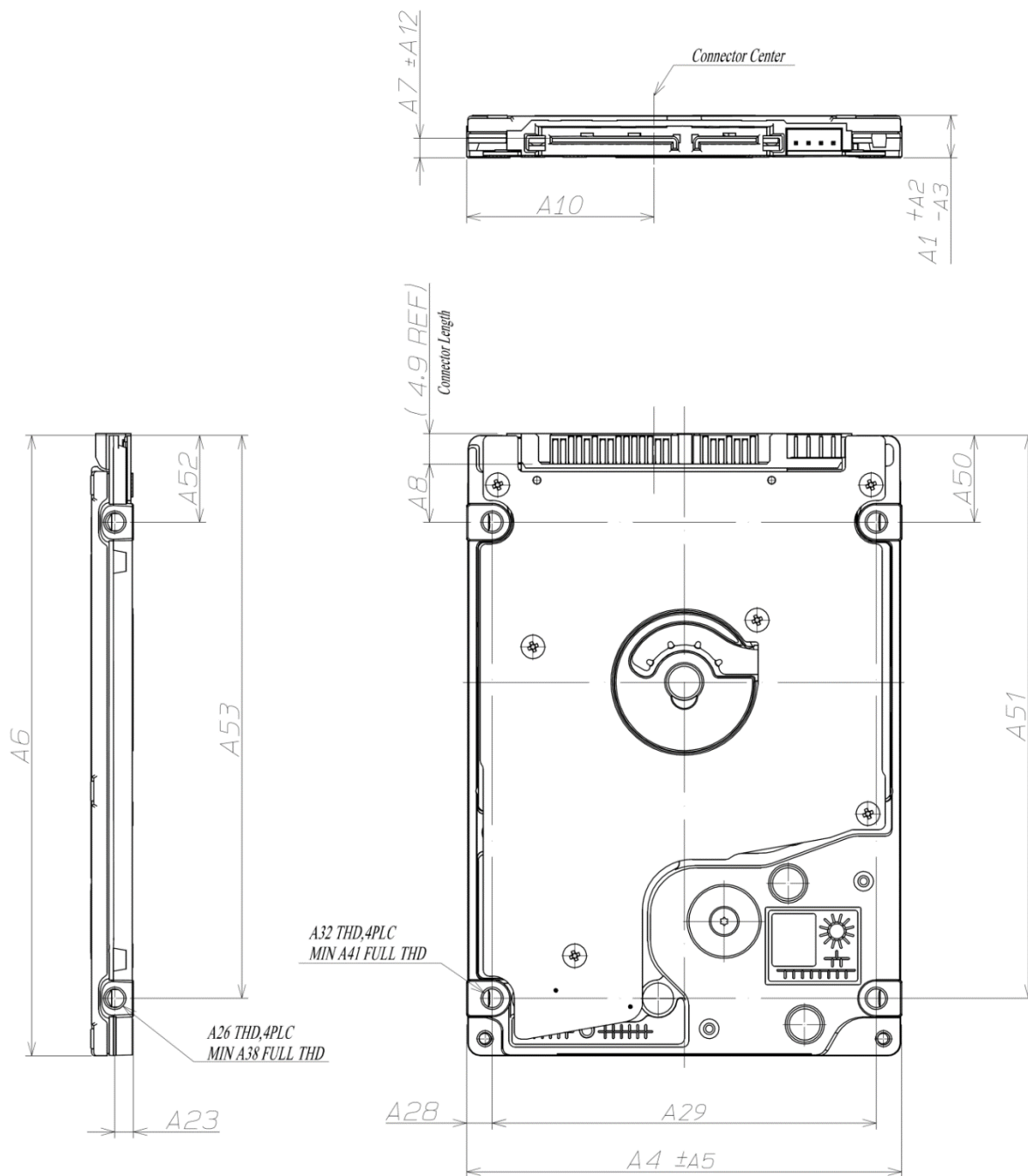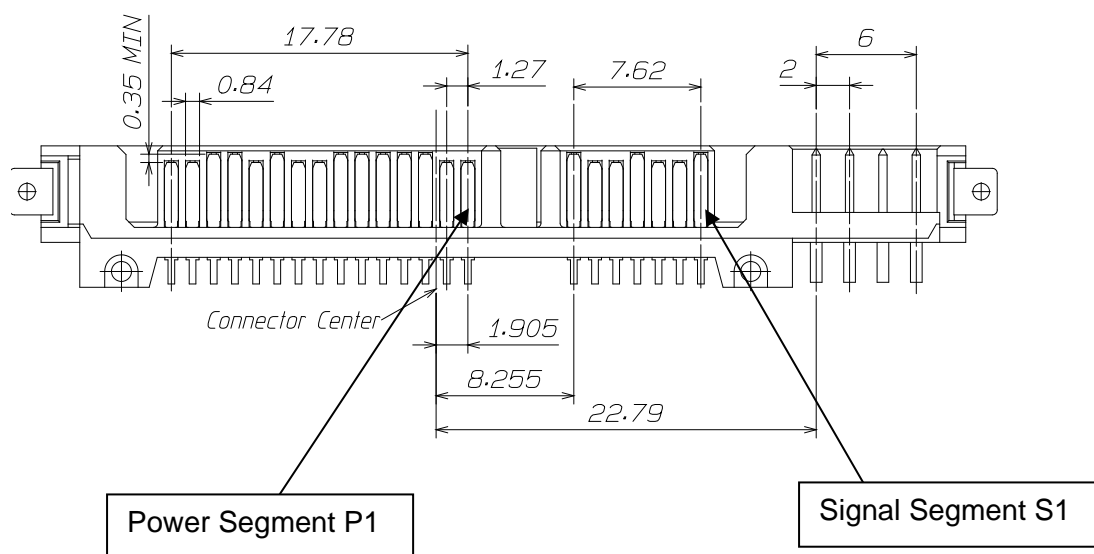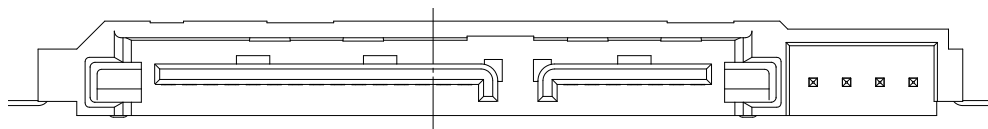
Figure.2   MQ04ABF100

Table.2   MQ04ABF100

Dimension	SFF-8200 Rev3.3[10] SFF-8201 Rev3.3 SFF-8223 Rev2.7		Toshiba S-ATA Model (Differences only)	
	mm	{ Inch }	mm	{ Inch }
A1	7.00	0.276		
A2	0.20	0.008		
A3	0.50	0.020		
A4	69.85	2.750		
A5	0.25	0.010		
A6[11]	100.45 Max	3.955 Max	100.00 ±0.41	3.937 ±0.016
A7	3.50	0.137		
A8	9.40	0.370	9.40 ±0.51	0.370 ±0.020
A10	—	—	30.125 ±0.28	1.186 ±0.011
A12	0.38	0.015		
A23	3.00	0.118	3.00 ±0.20	0.118±0.007
A28	4.07	0.160	4.07 +0.295 -0.305	0.160 +0.012 -0.012
A29	61.72	2.430	61.72 ±0.25	2.430 ±0.010
A50[11]	14.00	0.551	14.00 ±0.25	0.551 ±0.010
A51[11]	90.60	3.576	90.60 ±0.30	3.567 ±0.012
A52[11]	14.00	0.551	14.00 ±0.25	0.551 ±0.010
A53[11]	90.60	3.567	90.60 ±0.30	3.567 ±0.012

[10] SFF-8200: Small Form Factor Standard.
[11] PCA, Connector not included

17.78

0.35 MIN

0.84

1.27

7.62

2

6

Connector Center

1.905

8.255

22.79

Power Segment P1

Signal Segment S1

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❯ INTERFACE CONNECTOR (SATA plug) SIGNAL ALLOCATION

Segment	Pin No.		Pin Definition
Signal Segment	S1	GND	2nd Mate
	S2	A+	Differential Pair A from PHY (Device Rx+)
	S3	A-	Differential Pair A from PHY (Device Rx-)
	S4	GND	2nd Mate
	S5	B-	Differential Pair B from PHY (Device Tx-)
	S6	B+	Differential Pair B from PHY (Device Tx+)
	S7	GND	2nd Mate

Segment	Pin No.		Pin Definition
Power Segment	P1	V33	3.3 V Power (Unused)
	P2	V33	3.3 V Power (Unused)
	P3	V33	3.3 V Power Pre-Charge 2nd Mate (Unused)
	P4	GND	1st Mate
	P5	GND	2nd Mate
	P6	GND	2nd Mate
	P7	V5	5 V Power Pre-Charge 2nd Mate
	P8	V5	5 V Power
	P9	V5	5 V Power
	P10	GND	2nd Mate
	P11	Spin/ACT	- Staggered Spin-up Mode Detect (Input) - Activity LED Drive (Output)
	P12	GND	1st Mate
	P13	V12	12 V Power Pre-Charge 2nd Mate (Unused)
	P14	V12	12 V Power (Unused)
	P15	V12	12 V Power (Unused)

Notice: This drive uses 5V power only. 3.3V and 12V powe are not used.
HDA (Head Disk Assembly) and DC ground (ground pins on interface) are connected electrically each other.

COMMAND TABLE (Part 1)

Op-Code	Command Name
E5h / 98h	CHECK POWER MODE
B1h	DEVICE CONFIGURATION
92h / 93h	DOWNLOAD MICROCODE (DMA)
90h	EXECUTE DIAGNOSTICS
E7h	FLUSH CACHE
EAh	FLUSH CACHE EXT
ECh	IDENTIFY DEVICE
E3h / 97h	IDLE
E1h / 95h	IDLE IMMEDIATE
91h	INITIALIZE DEVICE PARAMETERS
00h	NOP
E4h	READ BUFFER
C8h	READ DMA
25h	READ DMA EXT
60h	READ FPDMA QUEUED
2Fh	READ LOG EXT
47h	READ LOG DMA EXT
C4h	READ MULTIPLE
29h	READ MULTIPLE EXT
F8h	READ NATIVE MAX ADDRESS
27h	READ NATIVE MAX ADDRESS EXT
20h	READ SECTOR(s)
24h	READ SECTOR(s) EXT
40h	READ VERIFY SECTOR(s)
42h	READ VERIFY SECTOR(S) EXT

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> **COMMAND TABLE (Part 2)**

Op-Code	Command Name
1xh	RECALIBRATE
0Bh	REQUEST SENSE DATA EXT
B4h	SANITIZE DEVICE
F1h	SECURITY SET PASSWORD
F2h	SECURITY UNLOCK
F3h	SECURITY ERASE PREPARE
F4h	SECURITY ERASE UNIT
F5h	SECURITY FREEZE LOCK
F6h	SECURITY DISABLE PASSWORD
70h – 76h, 79h – 7Fh	SEEK
77h	SET DATE & TIME EXT
EFh	SET FEATURES
F9h	SET MAX
37h	SET MAX ADDRESS EXT
C6h	SET MULTIPLE MODE
E6h / 99h	SLEEP
B0h	SMART Function Set
E2h / 96h	STANDBY
E0h / 94h	STANDBY IMMEDIATE
E8h	WRITE BUFFER
CAh	WRITE DMA
35h	WRITE DMA EXT
3Dh	WRITE DMA FUA EXT
61h	WRITE FPDMA QUEUED
3Fh	WRITE LOG EXT
57h	WRITE LOG DMA EXT
C5h	WRITE MULTIPLE
39h	WRITE MULTIPLE EXT
CEh	WRITE MULTIPLE FUA EXT
30h	WRITE SECTOR(s)
34h	WRITE SECTOR(s) EXT
45h	WRITE UNCORRECTABLE EXT
3Ch	WRITE VERIFY

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