

5200 Series SATA NAND Flash SSD

**MTFDDAK240T, MTFDDAK480T, MTFDDAK960T, MTFDDAK1T9T,
MTFDDAK3T8T, MTFDDAK7T6T**

Features

- Micron® 3D TLC NAND Flash
- Three performance/endurance levels
 - ECO
 - PRO
 - MAX
- TCG Enterprise compliant self-encrypting drive (SED)
- SATA 6 Gb/s interface
- ATA modes supported
 - PIO mode 3, 4
 - Multiword DMA mode 0, 1, 2
 - Ultra DMA mode 0, 1, 2, 3, 4, 5, 6
- 512-byte sector size support
- Hot-plug capable
- Native command queuing support with 32-command slot support
- ATA-8 ACS-3 revision 5 command set compliant
- ATA security feature command set and password login support
- Security erase command set: fast and secure erase
- Performance (steady state)¹
 - Sequential 128KB read: Up to 540 MB/s
 - Sequential 128KB write: Up to 520 MB/s
 - Random 4KB read: Up to 95,000 IOPS
 - Random 4KB write: Up to 75,000 IOPS
- Quality of Service²
 - Read/Write (99.9%): 200µs/300µs (<2TB)
 - Read/Write (99.999%): 1000µs/700µs (<2TB)
- Endurance⁴: Total bytes written (TBW)
 - Up to 17600TB

- Reliability
 - MTTF: 3.0 million device hours³
 - Static and dynamic wear leveling
 - Uncorrectable bit error rate (UBER): <1 sector per 10¹⁷ bits read
 - End-to-end data protection
 - Enhanced power-loss data protection with data protection capacitor monitoring
- Self-monitoring, analysis, and reporting technology (SMART) command set
- Capacity⁴ (unformatted): 240GB, 480GB, 960GB, 1920GB, 3840GB, 7680GB
- Mechanical:
 - 2.5-inch x 7.0mm form factor
- RoHS-compliant package
- Secure field-upgradeable firmware with digitally signed firmware image
- Power consumption: <6.0W (TYP, 5V only)
- Operating temperature
 - Commercial (0°C to 70°C)⁵

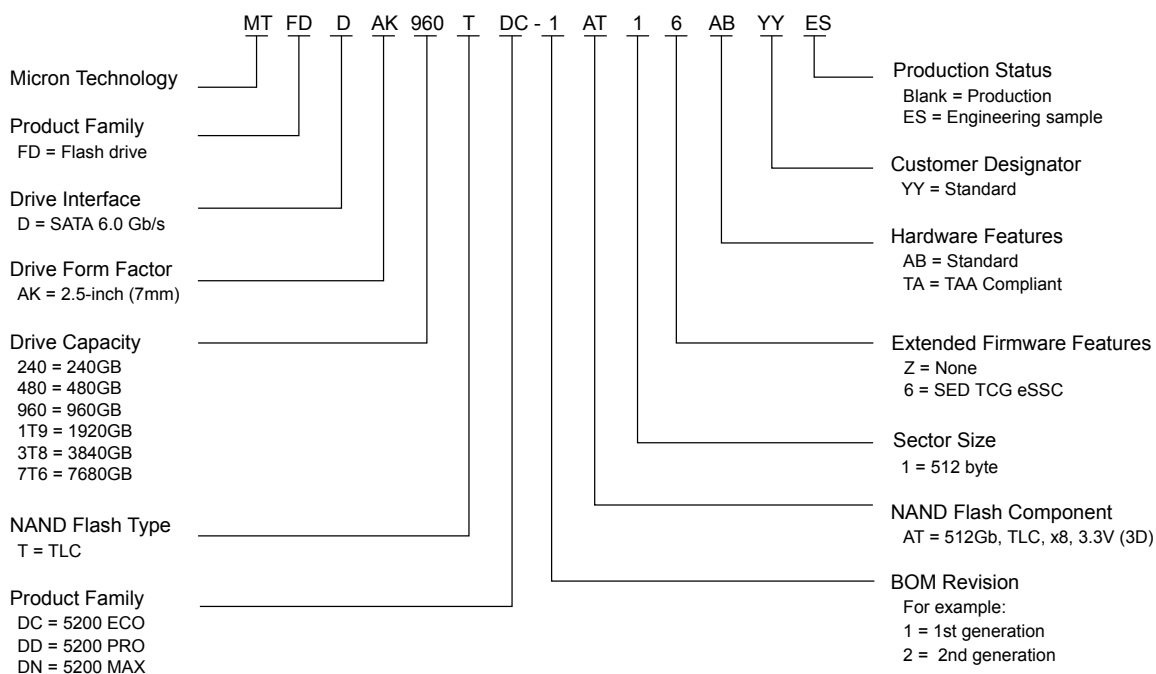
- Notes:
1. Performance varies by capacity and endurance.
 2. 4KB transfers QD = 1 used for READ/WRITE latency values.
 3. The product achieves a MTTF based on population statistics not relevant to individual units.
 4. 1GB = 1 billion bytes.
 5. As reported by SMART.

Warranty: Contact your Micron sales representative for further information regarding the product, including product warranties.

Part Numbering Information

Micron's 5200 SSD is available in different configurations and densities. The chart below is a comprehensive list of options for the 5200 series devices; not all options listed can be combined to define an offered product. Visit micron.com for a list of valid part numbers.

Figure 1: Part Number Chart



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General Description

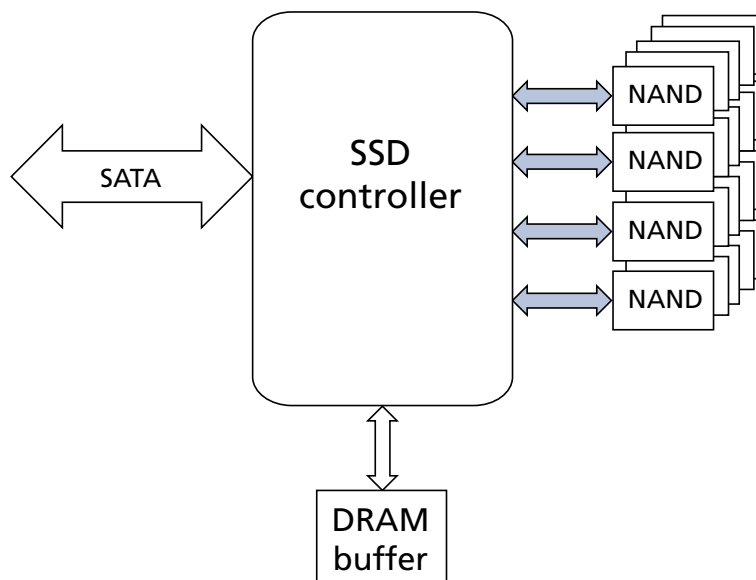
Micron's 5200 solid state drive (SSD) uses a single-chip controller with a SATA interface on the system side and four channels of Micron NAND Flash internally. Available in the 2.5-inch form factor, the SSD integrates easily in existing storage infrastructures.

The SSD is designed to use the SATA interface efficiently during both READs and WRITEs while delivering bandwidth-focused performance. SSD technology enables enhanced boot times, faster application load times, reduced power consumption and extended reliability.

The self-encrypting drive (SED) features an AES-256 encryption engine, providing hardware-based, secure data encryption, with no loss of SSD performance. This SED follows the TCG Enterprise specification for trusted peripherals. When TCG Enterprise features are not enabled, the device can perform alternate data encryption by invoking the ATA security command set encryption features, to provide full disk encryption (FDE) managed in the host system BIOS. TCG Enterprise and ATA security feature sets cannot be enabled simultaneously.

The data encryption is always running; however, encryption keys are not managed and the data is not secure until either TCG Enterprise or ATA security feature sets are enabled.

Figure 2: Functional Block Diagram



Performance

Measured performance can vary for a number of reasons. The major factors affecting drive performance are the capacity of the drive and the interface/HBA of the host. Additionally, overall system performance can affect the measured drive performance. When comparing drives, it is recommended that all system variables are the same, and only the drive being tested varies.

Performance numbers will vary depending on the host system configuration. Performance is measured using a single drive directly attached (no RAID) to an integrated SATA controller.

Table 1: Drive Performance – ECO

| Parameter | Capacity | | | | | Unit |
|-----------------------------------|----------|--------|--------|--------|--------|------|
| | 480GB | 960GB | 1920GB | 3840GB | 7680GB | |
| Sequential read (128KB transfer) | 540 | 540 | 540 | 540 | 540 | MB/s |
| Sequential write (128KB transfer) | 385 | 520 | 520 | 520 | 520 | MB/s |
| Random read (4KB transfer) | 81,000 | 95,000 | 95,000 | 95,000 | 95,000 | IOPS |
| Random write (4KB transfer) | 33,000 | 28,000 | 22,000 | 17,000 | 9500 | IOPS |
| Random 70/30 R/W (4KB transfer) | 43,000 | 49,000 | 42,000 | 46,000 | 26,000 | IOPS |
| READ latency (99.9%) | 200 | 200 | 200 | 200 | 200 | µs |
| WRITE latency (99.9%) | 300 | 300 | 300 | 500 | 900 | µs |
| READ latency (99.999%) | 1000 | 1000 | 1000 | 1000 | 1000 | µs |
| WRITE latency (99.999%) | 700 | 700 | 700 | 10,000 | 18,000 | µs |

- Notes:
1. Performance measured using FIO with a queue depth of 32 in the steady state region.
 2. 4KB transfers with a queue depth of 1 are used to measure READ/WRITE latency values.
 3. System variations and HBA used will affect measured results.

Table 2: Drive Performance – PRO

| Parameter | Capacity | | | Unit |
|-----------------------------------|----------|--------|--------|------|
| | 960GB | 1920GB | 3840GB | |
| Sequential read (128KB transfer) | 540 | 540 | 540 | MB/s |
| Sequential write (128KB transfer) | 520 | 520 | 520 | MB/s |
| Random read (4KB transfer) | 95,000 | 95,000 | 95,000 | IOPS |
| Random write (4KB transfer) | 32,000 | 32,000 | 24,500 | IOPS |
| Random 70/30 R/W (4KB transfer) | 53,000 | 53,000 | 57,000 | IOPS |
| READ latency (99.9%) | 200 | 200 | 200 | µs |
| WRITE latency (99.9%) | 300 | 300 | 900 | µs |
| READ latency (99.999%) | 1000 | 1000 | 2000 | µs |
| WRITE latency (99.999%) | 700 | 700 | 18,000 | µs |

- Notes:
1. Performance measured using FIO with a queue depth of 32 in the steady state region.
 2. 4KB transfers with a queue depth of 1 are used to measure READ/WRITE latency values.
 3. System variations and HBA used will affect measured results.

Table 3: Drive Performance – MAX

| Parameter | Capacity | | | | Unit |
|-----------------------------------|----------|--------|--------|--------|------|
| | 240GB | 480GB | 960GB | 1920GB | |
| Sequential read (128KB transfer) | 540 | 540 | 540 | 540 | MB/s |
| Sequential write (128KB transfer) | 310 | 460 | 520 | 520 | MB/s |
| Random read (4KB transfer) | 81,000 | 93,000 | 95,000 | 95,000 | IOPS |
| Random write (4KB transfer) | 53,000 | 70,000 | 75,000 | 70,000 | IOPS |
| Random 70/30 R/W (4KB transfer) | 55,000 | 60,000 | 70,000 | 66,000 | IOPS |
| READ latency (99.9%) | 200 | 200 | 200 | 200 | µs |
| WRITE latency (99.9%) | 300 | 300 | 300 | 300 | µs |
| READ latency (99.999%) | 2000 | 1000 | 1000 | 1000 | µs |
| WRITE latency (99.999%) | 700 | 700 | 700 | 700 | µs |

- Notes:
1. Performance measured using FIO with a queue depth of 32 in the steady state region.
 2. 4KB transfers with a queue depth of 1 are used to measure READ/WRITE latency values.
 3. System variations and HBA used will affect measured results.

Logical Block Address Configuration

The drive is set to report the number of logical block addresses (LBAs) that will ensure sufficient storage space for the specified capacity. Standard LBA settings, based on the IDEMA standard (LBA1-03), are shown below.

Table 4: Standard LBA Settings – 512-Byte Sector Size

| Capacity | Total LBA | | Max LBA | | User Available Bytes |
|----------|----------------|-------------|----------------|-------------|----------------------|
| | Decimal | Hexadecimal | Decimal | Hexadecimal | (Unformatted) |
| 240GB | 468,862,128 | 1BF244B0 | 468,862,127 | 1BF244AF | 240,057,409,536 |
| 480GB | 937,703,088 | 37E436B0 | 937,703,087 | 37E436AF | 480,103,981,056 |
| 960GB | 1,875,385,008 | 6FC81AB0 | 1,875,385,007 | 6FC81AAF | 960,197,124,096 |
| 1920GB | 3,750,748,848 | DF8FE2B0 | 3,750,748,847 | DF8FE2AF | 1,920,383,410,176 |
| 3840GB | 7,501,476,528 | 1BF1F72B0 | 7,501,476,527 | 1BF1F72AF | 3,840,755,982,336 |
| 7680GB | 15,002,931,888 | 37E3E92B0 | 15,002,931,887 | 37E3E92AF | 7,681,501,126,656 |

Reliability

Micron's SSDs incorporate advanced technology for defect and error management. They use various combinations of hardware-based error correction algorithms and firmware-based static and dynamic wear-leveling algorithms.

Over the life of the SSD, uncorrectable errors may occur. An uncorrectable error is defined as data that is reported as successfully programmed to the SSD but is unable to be later read back without error.

Table 5: Uncorrectable Bit Error Rate

| Uncorrectable Bit Error Rate | Operation |
|------------------------------|-----------|
| <1 sector per 10^{17} bits | READ |

Mean Time to Failure

Mean time to failure (MTTF) for the SSD can be predicted based on the component reliability data using the methods referenced in the Telcordia SR-332 reliability prediction procedures for electronic equipment.

Table 6: MTTF

| Capacity | MTTF (Operating Hours) |
|----------------|------------------------|
| All capacities | 3.0 million |

Note: 1. The product achieves a MTTF of 3.0 million hours based on population statistics not relevant to individual units.

Endurance

Endurance for the SSD can be predicted based on the usage conditions applied to the device, the internal NAND component cycles, the write amplification factor, and the wear-leveling efficiency of the drive. Total bytes written measured with 55°C case temperature within the total bytes written values listed in this document. The table below shows the drive lifetime for each SSD capacity based on predefined usage conditions.

Table 7: Drive Lifetime

| Capacity | Drive Lifetime (Total Bytes Written) | | | Unit |
|----------|--------------------------------------|-------|-------|------|
| | ECO | PRO | MAX | |
| 240GB | – | – | 2200 | TB |
| 480GB | 870 | – | 4380 | |
| 960GB | 1750 | 2270 | 8760 | |
| 1920GB | 3500 | 5950 | 17520 | |
| 3840GB | 7700 | 17600 | – | |
| 7680GB | 8400 | – | – | |

- Notes:
1. Total bytes written were calculated assuming drive is 100% full (user capacity) and a workload of 100% random, aligned 4KB writes.
 2. 1TB = 1,000,000,000,000

Electrical Characteristics

Stresses greater than those listed may cause permanent damage to the device. This is a stress rating only, and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Table 8: SATA Power Consumption (5V Only) – 2.5-inch

| Capacity | Idle Average | Sequential Write (128KB transfer) | Sequential Read (128KB transfer) |
|----------|--------------|--------------------------------------|-------------------------------------|
| 240GB | 1.5W | 3.0W | 2.5W |
| 480GB | 1.5W | 3.1W | 2.5W |
| 960GB | 1.5W | 3.4W | 2.8W |
| 1920GB | 1.5W | 3.6W | 3.0W |
| 3840GB | 1.5W | 3.3W | 2.5W |
| 7680GB | 1.5W | 3.3W | 2.5W |

- Notes: 1. Data taken at 25°C using a 6 Gb/s SATA interface.
2. Sequential power measured during FIO with 128KB transfer, RMS average over a 500ms window.

Table 9: Maximum Ratings

| Parameter/Condition | Symbol | Min | Max | Unit |
|---------------------------------------|----------------|------|------|---------|
| Voltage input (2.5-inch) ¹ | V12 | 10.8 | 13.2 | V |
| | V5 | 4.5 | 5.5 | V |
| Operating temperature ² | T _C | 0 | 70 | °C |
| Non-operating temperature | – | –40 | 85 | °C |
| Rate of temperature change | – | – | 20 | °C/hour |
| Relative humidity (non-condensing) | – | 5 | 95 | % |

- Notes: 1. 5V supply required; 12V supply optional
2. Based upon drive temperature reported by SMART

Table 10: Shock and Vibration

| Parameter/Condition | Specification |
|---------------------------------|----------------------|
| Non-operating shock | 1500G/0.5ms |
| Rotary vibration, non-operating | 5–800Hz at 3.13 Grms |

Device ID

Table 11: Identify Device

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|-------|--------|---------|-------------------|--|
| 0 | – | – | – | General configuration bit-significant information |
| | 15 | F | 0b | 0 = ATA device |
| | 14–8 | X | 0000100b | Retired |
| | 7–6 | X | 01b | Obsolete |
| | 5–3 | X | 000b | Retired |
| | 2 | V | 0b | Response incomplete |
| | 1 | X | 0b | Retired |
| | 0 | F | 0b | Reserved |
| 1 | – | X | 3FFFh | Obsolete |
| 2 | – | F | C837h | Specific configuration |
| 3 | – | X | 0010h | Obsolete |
| 4–5 | – | X | 0000h 0000h | Retired |
| 6 | – | X | 003Fh | Obsolete |
| 7–8 | – | V | 0000h 0000h | Reserved for assignment by the CompactFlash™ Association |
| 9 | – | X | 0000h | Retired |
| 10–19 | – | F | Varies | Serial number (20 ASCII characters) |
| 20–22 | – | X | 0000h 0000h 0000h | Retired/obsolete |
| 23–26 | – | F | Varies | Firmware revision (8 ASCII characters) |
| 27–46 | – | F | Varies | Model number (40 ASCII characters) |
| 47 | 15–8 | F | 80h | 80h |
| | 7–0 | F | 10h | 00h = Reserved 01h–FFh = Maximum number of logical sectors that shall be transferred per DRQ data block on READ/WRITE MULTIPLE commands |
| 48 | – | – | – | Trusted Computing feature set options |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13–1 | F | 0000000000000b | Reserved for the Trusted Computing Group |
| | 0 | F | 0b/1b | 1 = Trusted Computing feature set is supported This bit will be 1 for TCG drives, otherwise 0 |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|-------|--------|---------|------------------------------------|---|
| 49 | – | – | – | Capabilities |
| | 15–14 | F | 00b | Reserved for the IDENTIFY PACKET DEVICE command |
| | 13 | F | 1b | 1 = Standby timer values as specified in this standard are supported 0 = Standby timer values shall be managed by the device |
| | 12 | F | 0b | Reserved for the IDENTIFY PACKET DEVICE command |
| | 11 | F | 1b | 1 = IORDY is supported 0 = IORDY may be supported |
| | 10 | F | 1b | 1 = IORDY may be disabled |
| | 9 | F | 1b | 1 = LBA is supported |
| | 8 | F | 1b | 1 = DMA is supported |
| | 7–2 | F | 000000b | Reserved |
| | 1–0 | V | 00b | Long physical sector alignment error reporting |
| 50 | – | – | – | Capabilities |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13–2 | F | 000000000000b | Reserved |
| | 1 | X | 0b | Obsolete |
| | 0 | F | 1b | Shall be set to one to indicate a vendor-specific standby timer value minimum |
| 51–52 | – | X | 0000h 0000h | Obsolete |
| 53 | 15–8 | V | 00h | Free-fall control sensitivity: 00h = Vendor's recommended setting 01h–FFh = Sensitivity level |
| | 7–3 | F | 00000b | Reserved |
| | 2 | F | 1b | 1 = The fields reported in word 88 are valid 0 = The fields reported in word 88 are not valid |
| | 1 | F | 1b | 1 = The fields reported in words (70:64) are valid 0 = the fields reported in words (70:64) are not valid |
| | 0 | X | 0b | Obsolete |
| 54–58 | – | X | 3FFh 0010h 003Fh FC10h 00FBh | Obsolete |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|-------|--------|---------|-----------------|--|
| 59 | 15 | F | 1b | 1 = The BLOCK ERASE EXT command is supported |
| | 14 | F | 1b | 1 = The OVERWRITE EXT command is supported |
| | 13 | F | 1b | 1 = The CRYPTO SCRAMBLE EXT command is supported |
| | 12 | F | 1b | 1 = The sanitize feature set is supported |
| | 11 | F | 1b | 1 = The commands allowed during a sanitize operation are specified by ACS-3 |
| | 10 | F | 1b | The SANITIZE ANTIFREEZE LOCK EXT command is supported |
| | 9 | F | 0b | Reserved |
| | 8 | V | 1b | 1 = Multiple sector settings are valid |
| | 7-0 | V | 00010000b | xxh = Current setting for number of logical sectors that shall be transferred per DRQ data block on READ/WRITE MULTIPLE commands |
| 60-61 | – | F | FFFFh 0FFFh | Total number of user addressable logical sectors for 28-bit commands |
| 62 | – | X | 0000h | Obsolete |
| 63 | 15-11 | F | 00000b | Reserved |
| | 10 | V | 0b | 1 = Multiword DMA mode 2 is selected 0 = Multiword DMA mode 2 is not selected |
| | 9 | V | 0b | 1 = Multiword DMA mode 1 is selected 0 = Multiword DMA mode 1 is not selected |
| | 8 | V | 0b | 1 = Multiword DMA mode 0 is selected 0 = Multiword DMA mode 0 is not selected |
| | 7-3 | F | 00000b | Reserved |
| | 2 | F | 1b | 1 = Multiword DMA mode 2 and below are supported |
| | 1 | F | 1b | 1 = Multiword DMA mode 1 and below are supported |
| | 0 | F | 1b | 1 = Multiword DMA mode 0 is supported |
| 64 | 15-2 | F | 00000000000000b | Reserved |
| | 1 | F | 1b | PIO mode 4 supported |
| | 0 | F | 1b | PIO mode 3 supported |
| 65 | – | F | 0078h | Minimum Multiword DMA transfer cycle time per word Cycle time in nanoseconds |
| 66 | – | F | 0078h | Manufacturer's recommended Multiword DMA transfer cycle time Cycle time in nanoseconds |
| 67 | – | F | 0078h | Minimum PIO transfer cycle time without flow control Cycle time in nanoseconds |
| 68 | – | F | 0078h | Minimum PIO transfer cycle time with IORDY flow control Cycle time in nanoseconds |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|-------|--------|---------|-------------------------|---|
| 69 | – | F | – | Additional supported |
| | 15 | F | 0b | Reserved for CFA |
| | 14 | F | 1b | 1 = Deterministic read after trim is supported |
| | 13 | F | 0b | 1 = Long physical sector alignment error reporting control is supported |
| | 12 | X | 0b | Obsolete |
| | 11 | F | 1b | 1 = READ BUFFER DMA is supported |
| | 10 | F | 1b | 1 = WRITE BUFFER DMA is supported |
| | 9 | X | 0b | Obsolete |
| | 8 | F | 1b | 1 = DOWNLOAD MICROCODE DMA is supported |
| | 7 | F | 0b | Reserved for IEEE-1667 |
| | 6 | F | 0b | 0 = Optional ATA device 28-bit commands are supported |
| | 5 | F | 1b | 1 = Read zero after trim is supported |
| | 4 | F | 0b/1b | 1 = Device encrypts all user data This bit will be 1 for TCG drives, otherwise 0 |
| | 3 | F | 0b | 1 = Extended number of user addressable sectors is supported (words 230 – 233) |
| | 2 | F | 0b | All write cache is nonvolatile |
| | 1–0 | – | 00b | Reserved |
| 70 | – | F | 0000h | Reserved |
| 71–74 | – | F | 0000h 0000h 0000h 0000h | Reserved for the IDENTIFY PACKET DEVICE command |
| 75 | – | – | – | Queue depth |
| | 15–5 | F | 00000000000b | Reserved |
| | 4–0 | F | 11111b | Maximum queue depth - 1 |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 76 | – | – | – | Serial ATA capabilities |
| | 15 | F | 1b | 1 = Supports READ LOG DMA EXT as equivalent to READ LOG EXT |
| | 14 | F | 0b | 1 = Supports Device automatic partial to slumber transitions |
| | 13 | F | 0b | 1 = Supports host automatic partial to slumber transitions |
| | 12 | F | 1b | Native command queuing priority information is supported |
| | 11 | F | 0b | Unload while NCQ commands are outstanding is supported |
| | 10 | F | 1b | SATA physical event counter log is supported |
| | 9 | F | 0b | 1 = Receipt of host-initiated interface power management requests is supported |
| | 8 | F | 1b | Native command queuing is supported |
| | 7–4 | F | 0000b | Reserved for future Serial ATA signaling speed grades |
| | 3 | F | 1b | 1 = Serial ATA Gen-3 speed (6.0 Gb/s) is supported |
| | 2 | F | 1b | 1 = Serial ATA Gen-2 speed (3.0 Gb/s) is supported |
| | 1 | F | 1b | 1 = Serial ATA Gen-1 speed (1.5 Gb/s) is supported |
| | 0 | F | 0b | Reserved (set to 0) |
| 77 | – | – | – | Serial ATA additional capabilities |
| | 15–7 | – | 00000000b | Reserved for Serial ATA |
| | 6 | F | 0b | 1 = Supports RECEIVE FPDMA QUEUED and SEND FPDMA QUEUED commands |
| | 5 | F | 0b | NCQ QUEUE MANAGEMENT command is supported |
| | 4 | F | 0b | NCQ streaming is supported |
| | 3–1 | V | Varies | Coded value indicating current negotiated Serial ATA signal speed |
| | 0 | F | 0b | Shall be cleared to zero |
| 78 | – | – | – | Serial ATA features are supported |
| | 15–8 | – | 00000000b | Reserved for Serial ATA |
| | 7 | F | 0b | 1 = Device supports NCQ autosense |
| | 6 | F | 1b | 1 = Supports software settings preservation |
| | 5 | F | 0b | 1 = Device supports hardware feature control |
| | 4 | F | 0b | 1 = In-order data delivery is supported |
| | 3 | F | 0b | 1 = Device-initiated interface power management is supported |
| | 2 | F | 1b | 1 = DMA setup auto-activate optimization is supported |
| | 1 | F | 0b | 1 = Non-zero buffer offsets in DMA setup FIS are supported |
| | 0 | F | 0b | Reserved (set to 0) |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|---|
| 79 | – | – | – | Serial ATA features are enabled |
| | 15–8 | – | 00000000b | Reserved for Serial ATA |
| | 7 | V | 0b | 1 = Automatic partial to slumber transitions are enabled |
| | 6 | V | 1b | 1 = Software settings preservation is enabled |
| | 5 | V | 0b | 1 = Hardware feature control is enabled |
| | 4 | V | 0b | 1 = In-order data delivery is enabled |
| | 3 | V | 0b | 1 = Device-initiated interface power management is enabled |
| | 2 | V | 0b | 1 = DMA setup auto-activate optimization is enabled |
| | 1 | V | 0b | 1 = Non-zero buffer offsets in DMA setup FIS is enabled |
| | 0 | V | 0b | Reserved (set to 0) |
| 80 | – | – | – | Major revision number |
| | 15–12 | F | 0000b | Reserved |
| | 11 | F | 0b | 1 = ATA8-ACS4 is supported |
| | 10 | F | 1b | 1 = ATA8-ACS3 is supported |
| | 9 | F | 1b | 1 = ATA8-ACS2 is supported |
| | 8 | F | 1b | 1 = ATA8-ACS is supported |
| | 7 | F | 1b | 1 = ATA/ATAPI-7 is supported |
| | 6 | F | 1b | 1 = ATA/ATAPI-6 is supported |
| | 5 | F | 1b | 1 = ATA/ATAPI-5 is supported |
| | 4–1 | X | 1100b | Obsolete |
| | 0 | – | 0b | Reserved |
| 81 | – | F | 006Dh | Minor revision number |
| 82 | – | – | – | Command and feature sets are supported |
| | 15 | X | 0b | Obsolete |
| | 14 | F | 1b | 1 = NOP command is supported |
| | 13 | F | 1b | 1 = READ BUFFER command is supported |
| | 12 | F | 1b | 1 = WRITE BUFFER command is supported |
| | 11–10 | X | 00b | Obsolete |
| | 9 | F | 0b | 1 = DEVICE RESET command is supported |
| | 8–7 | X | 00b | Obsolete |
| | 6 | F | 1b | 1 = Read look-ahead is supported |
| | 5 | F | 1b | 1 = Write cache is supported |
| | 4 | F | 0b | Shall be cleared to zero to indicate that the packet feature set is not supported |
| | 3 | F | 1b | 1 = Mandatory power management feature set is supported |
| | 2 | X | 0b | Obsolete |
| | 1 | F | 1b | 1 = Security feature set is supported |
| | 0 | F | 1b | 1 = SMART feature set is supported |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|---|
| 83 | – | – | – | Command and feature sets are supported |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13 | F | 1b | 1 = FLUSH CACHE EXT command is supported |
| | 12 | F | 1b | 1 = Mandatory FLUSH CACHE command is supported |
| | 11 | X | 0b | Obsolete |
| | 10 | F | 1b | 1 = 48-bit address feature set is supported |
| | 9–7 | X | 000b | Obsolete |
| | 6 | F | 0b | 1 = SET FEATURES subcommand required to spin-up after power-up |
| | 5 | F | 0b | 1 = Power-up in standby feature set is supported |
| | 4 | X | 0b | Obsolete |
| | 3 | F | 1b | 1 = Advanced power management feature set is supported |
| | 2 | F | 0b | Reserved for CFA |
| | 1 | X | 0b | Obsolete |
| | 0 | F | 1b | 1 = DOWNLOAD MICROCODE command is supported |
| 84 | – | – | – | Command and feature sets are supported |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13 | F | 1b | 1 = Idle immediate with unload feature is supported |
| | 12 | F | 0b | Reserved for technical report INCITS TR-37-2004 (TLC) |
| | 11 | F | 0b | Reserved for technical report INCITS TR-37-2004 (TLC) |
| | 10–9 | X | 00b | Obsolete |
| | 8 | F | 1b | 1 = 64-bit word wide name is supported |
| | 7 | X | 0b | Obsolete |
| | 6 | F | 1b | 1 = WRITE DMA FUA EXT and WRITE MULTIPLE FUA EXT commands are supported |
| | 5 | F | 1b | 1 = General purpose logging feature set is supported |
| | 4 | F | 0b | 1 = Streaming feature set is supported |
| | 3 | X | 0b | Obsolete |
| | 2 | – | 0b | Reserved |
| | 1 | F | 1b | 1 = SMART self-test is supported |
| | 0 | F | 1b | 1 = SMART error logging is supported |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|---|
| 85 | – | – | – | Command and feature sets are supported or enabled |
| | 15 | X | 0b | Obsolete |
| | 14 | F | 1b | 1 = NOP command is supported |
| | 13 | F | 1b | 1 = READ BUFFER command is supported |
| | 12 | F | 1b | 1 = WRITE BUFFER command is supported |
| | 11–10 | X | 00b | Obsolete |
| | 9 | F | 0b | 1 = DEVICE RESET command is supported |
| | 8–7 | X | 00b | Obsolete |
| | 6 | V | 1b | 1 = Read look-ahead is enabled |
| | 5 | V | 1b | 1 = Write cache is enabled |
| | 4 | F | 0b | Shall be cleared to zero to indicate that the packet feature set is not supported |
| | 3 | F | 1b | Mandatory power management feature set is supported |
| | 2 | X | 0b | Obsolete |
| | 1 | V | 0b | 1 = Security feature set is enabled |
| | 0 | V | 1b | 1 = SMART feature set is enabled |
| 86 | – | – | – | Command and feature sets are supported or enabled |
| | 15 | – | 1b | 1 = Words 120-119 are valid |
| | 14 | X | 0b | Reserved |
| | 13 | F | 1b | 1 = FLUSH CACHE EXT command is supported |
| | 12 | F | 1b | 1 = FLUSH CACHE command is supported |
| | 11 | X | 0b | Obsolete |
| | 10 | F | 1b | 1 = 48-bit address feature set is supported |
| | 9–7 | X | 000b | Obsolete |
| | 6 | F | 0b | 1 = SET FEATURES subcommand required to spin-up after power-up |
| | 5 | V | 0b | 1 = Power-up in standby feature set is enabled |
| | 4 | X | 0b | Obsolete |
| | 3 | V | 1b | 1 = Advanced power management feature set is enabled |
| | 2 | X | 0b | Reserved for CFA |
| | 1 | X | 0b | Obsolete |
| | 0 | F | 1b | 1 = DOWNLOAD MICROCODE command is supported |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 87 | – | – | – | Command and feature sets are supported or enabled |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13 | F | 1b | 1 = IDLE IMMEDIATE with UNLOAD FEATURE is supported |
| | 12–9 | X | 0000b | Obsolete |
| | 8 | F | 1b | 1 = 64-bit word wide name is supported |
| | 7 | X | 0b | Obsolete |
| | 6 | F | 1b | 1 = WRITE DMA FUA EXT and WRITE MULTIPLE FUA EXT commands are supported |
| | 5 | F | 1b | 1 = General purpose logging feature set is supported |
| | 4–3 | X | 00b | Obsolete |
| | 2 | V | 0b | 1 = Media serial number is valid |
| | 1 | F | 1b | 1 = SMART self-test is supported |
| | 0 | F | 1b | 1 = SMART error logging is supported |
| 88 | – | – | 0b | Ultra DMA modes |
| | 15 | – | 0b | Reserved |
| | 14 | V | 0b | 1 = Ultra DMA mode 6 is selected 0 = Ultra DMA mode 6 is not selected |
| | 13 | V | 0b | 1 = Ultra DMA mode 5 is selected 0 = Ultra DMA mode 5 is not selected |
| | 12 | V | 0b | 1 = Ultra DMA mode 4 is selected 0 = Ultra DMA mode 4 is not selected |
| | 11 | V | 0b | 1 = Ultra DMA mode 3 is selected 0 = Ultra DMA mode 3 is not selected |
| | 10 | V | 0b | 1 = Ultra DMA mode 2 is selected 0 = Ultra DMA mode 2 is not selected |
| | 9 | V | 0b | 1 = Ultra DMA mode 1 is selected 0 = Ultra DMA mode 1 is not selected |
| | 8 | V | 0b | 1 = Ultra DMA mode 0 is selected 0 = Ultra DMA mode 0 is not selected |
| | 7 | – | 0b | Reserved |
| | 6 | V | 1b | 1 = Ultra DMA mode 6 and below are supported |
| | 5 | V | 1b | 1 = Ultra DMA mode 5 and below are supported |
| | 4 | V | 1b | 1 = Ultra DMA mode 4 and below are supported |
| | 3 | V | 1b | 1 = Ultra DMA mode 3 and below are supported |
| | 2 | V | 1b | 1 = Ultra DMA mode 2 and below are supported |
| | 1 | V | 1b | 1 = Ultra DMA mode 1 and below are supported |
| | 0 | V | 1b | 1 = Ultra DMA mode 0 is supported |
| 89 | – | F | 0002h | Time required for security erase unit completion |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|---------|--------|---------|-------------------------|--|
| 90 | – | F | 0002h | Time required for enhanced security erase completion |
| 91 | – | V | 00FEh | Current advanced power management value |
| 92 | – | V | FFFEh | Master password revision code |
| 93 | – | – | 0000h | Hardware reset results; set to 0000h for SATA devices |
| 94 | – | X | 0000h | Obsolete |
| 95 | – | F | 0000h | Stream minimum request size |
| 96 | – | V | 0000h | Streaming transfer time - DMA |
| 97 | – | V | 0000h | Streaming access latency - DMA and PIO |
| 98–99 | – | F | 0000h 0000h | Streaming performance granularity (98-99) |
| 100–103 | – | V | Varies by capacity | Maximum user LBA for 48-bit address feature set |
| 104 | – | V | 0000h | Streaming transfer time - PIO |
| 105 | – | F | 0008h | Maximum number of 512-byte blocks of LBA range entries per DATA SET MANAGEMENT command |
| 106 | – | – | – | Physical sector size/logical sector size |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13 | F | 1b | 1 = Device has multiple logical sectors per physical sector |
| | 12 | F | 0b | 1 = Device logical sector longer than 256 Words |
| | 11–4 | F | 00000000b | Reserved |
| | 3–0 | F | Varies | Logical sectors per physical sector |
| 107 | – | F | 0000h | Inter-seek delay for ISO-7779 acoustic testing in microseconds |
| 108 | 15–12 | F | 0101b | NAA (3-0) |
| | 11–0 | – | 000000001010b | IEEE OUI (23-12) |
| 109 | 15–4 | F | 000001110101b | IEEE OUI (11-0) |
| | 3–0 | – | Varies | Unique ID (35-32) |
| 110 | – | F | Varies | 5-0 unique ID (31-16) |
| 111 | – | F | Varies | Unique ID (15-0) |
| 112–115 | – | F | 0000h 0000h 0000h 0000h | Reserved for 128-bit world wide name extension to 128 bits |
| 116 | – | X | 0000h | Obsolete |
| 117–118 | – | F | 0000h 0000h | Words per logical sector |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|---------|--------|---------|--|---|
| 119 | – | – | – | Command and feature sets are supported (continued from words 84-82) |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13–10 | F | 0000b | Reserved |
| | 9 | F | 0b | 1 = DSN feature set is supported |
| | 8 | F | 1b | 1 = Accessible maximum address configuration feature set is supported |
| | 7 | F | 0b | 1 = Extended power conditions feature set is supported |
| | 6 | F | 0b | 1 = Sense data reporting feature set is supported |
| | 5 | F | 0b | 1 = Free-fall control feature set is supported |
| | 4 | F | 1b | 1 = DOWNLOAD MICROCODE command with mode 3 supported |
| | 3 | F | 1b | 1 = READ LOG DMA EXT and WRITE LOG DMA EXT commands supported |
| | 2 | F | 1b | 1 = Write uncorrectable EXT command is supported |
| | 1 | F | 1b | 1 = Write-read-verify feature set is supported |
| | 0 | X | 0b | Obsolete |
| 120 | – | – | – | Commands and feature sets are supported or enabled (continued from words 87-85) |
| | 15 | – | 0b | Shall be cleared to zero |
| | 14 | – | 1b | Shall be set to one |
| | 13–10 | – | 0000b | Reserved |
| | 9 | – | 0b | DSN feature set is enabled |
| | 8 | – | 0b | Reserved |
| | 7 | – | 0b | 1 = Extended power conditions feature set is enabled |
| | 6 | – | 0b | 1 = Sense data reporting feature set is enabled |
| | 5 | – | 0b | 1 = Free-fall control feature set is enabled |
| | 4 | F | 1b | 1 = The DOWNLOAD MICROCODE command with mode 3 is supported |
| | 3 | F | 1b | 1 = The READ LOG DMA EXT and WRITE LOG DMA EXT commands are supported |
| | 2 | F | 1b | 1 = The WRITE UNCORRECTABLE EXT command is supported |
| | 1 | V | 0b | 1 = The write-read-verify feature set is enabled |
| | 0 | X | 0b | Obsolete |
| 121–126 | – | F | 0000h 0000h 0000h 0000h 0000h 0000h | Reserved for expanded supported and enabled settings |
| 127 | – | X | 0000h | Obsolete |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|---------|--------|---------|---|--|
| 128 | – | – | – | Security status |
| | 15–9 | F | 0000000b | Reserved |
| | 8 | V | 0b | Master password capability: 0 = High, 1 = Maximum |
| | 7–6 | F | 00b | Reserved |
| | 5 | F | 1b | 1 = Enhanced security erase is supported |
| | 4 | V | 0b | 1 = Security count is expired |
| | 3 | V | 0b | 1 = Security is frozen |
| | 2 | V | 0b | 1 = Security is locked |
| | 1 | V | 0b | 1 = Security is enabled |
| | 0 | F | 1b | 1 = Security is supported |
| 129–159 | – | X | Vendor-specific data | Vendor specific |
| 160–167 | – | – | 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h | Reserved for the CompactFlash Association |
| 168 | 15–4 | F | 000h | Reserved |
| | 3–0 | F | Varies | Device nominal form factor; 3h = 2.5", 7h = M.2 |
| 169 | – | – | – | DATA SET MANAGEMENT command support |
| | 15–1 | F | 000000000000000b | Reserved |
| | 0 | F | 1b | 1 = The trim bit in the DATA SET MANAGEMENT command is supported |
| 170–173 | – | F | 0000h 0000h 0000h 0000h | Additional product identifier |
| 174–175 | – | F | 0000h 0000h | Reserved |
| 176–205 | – | V | Varies | Current media serial number (60 ASCII characters) |
| 206 | – | – | – | SCT command transport |
| | 15–12 | X | 0000b | Vendor-specific |
| | 11–6 | F | 000000b | Reserved |
| | 5 | F | 1b | 1 = The SCT Data Tables command is supported |
| | 4 | F | 1b | 1 = The SCT Feature Control command is supported |
| | 3 | F | 0b | 1 = The SCT Error Recovery Control command is supported |
| | 2 | F | 1b | 1 = The SCT Write Same command is supported |
| | 1 | X | 0b | Obsolete |
| | 0 | F | 1b | 1 = The SCT Command Transport is supported |
| 207–208 | – | – | 0000h 0000h | Reserved |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|---------|--------|---------|---|---|
| 209 | – | – | – | Alignment of logical blocks within a larger physical block |
| | 15 | F | 0b | Shall be cleared to zero |
| | 14 | F | 1b | Shall be set to one |
| | 13–0 | F | 00000000000000b | Logical sector offset within the first physical sector where the first logical sector is placed |
| 210–211 | – | V | 0000h 0000h | Write-read-verify sector count mode 3 |
| 212–213 | – | F | 0000h 0001h | Write-read-verify sector count mode 2 |
| 214–216 | – | X | 0000h 0000h 0000h | Obsolete |
| 217 | – | F | 0001h | Nominal media rotation rate (non-rotating media) |
| 218 | – | – | 0000h | Reserved |
| 219 | – | X | 0000h | Obsolete |
| 220 | 15–8 | F | 00h | Reserved |
| | 7–0 | V | 00h | Write-read-verify feature set current mode |
| 221 | – | – | 0000h | Reserved |
| 222 | – | – | – | Transport major revision number. 0000h or FFFFh = Device does not report version |
| | 15–12 | F | 0001b | Transport type: 0h = Parallel, 1h = Serial, Eh = PCIe, All others = Reserved |
| | 11–8 | – | 0000b | Reserved |
| | 7 | F | 1b | 1 = SATA rev 3.2 is supported |
| | 6 | F | 1b | 1 = SATA rev 3.1 is supported |
| | 5 | F | 1b | 1 = SATA rev 3.0 is supported |
| | 4 | F | 1b | 1 = SATA rev 2.6 is supported |
| | 3 | F | 1b | 1 = SATA rev 2.5 is supported |
| | 2 | F | 1b | 1 = SATA II: Extensions are supported |
| | 1 | F | 1b | 1 = SATA rev 1.0a is supported |
| | 0 | F | 1b | 1 = ATA8-AST is supported |
| 223 | – | F | 0000h | Transport minor revision number |
| 224–229 | – | F | 0000h 0000h 0000h 0000h 0000h 0000h | Reserved |
| 230–233 | – | – | 0000h 0000h 0000h 0000h | Extended number of user-addressable sectors |
| 234 | – | F | 0001h | Minimum number of 512-byte units per DOWNLOAD MICRO-CODE command for mode 3 |
| 235 | – | F | 0FFFh | Maximum number of 512-byte units per DOWNLOAD MICRO-CODE command for mode 3 |
| 236–242 | – | – | 0000h 0000h 0000h 0000h 0000h 0000h 0000h | Reserved |

Table 11: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|---------|--------|---------|--|--|
| 243 | 15 | – | 0b | Reserved |
| | 14 | F | 0b/1b | 1 = FDE security features supported This bit will be 1 for TCG drives, otherwise 0. |
| | 13–0 | – | 00000000000000b | Reserved |
| 244–254 | – | – | 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h | |
| 255 | – | F | – | Integrity word |
| | 15–8 | – | Varies | Checksum |
| | 7–0 | – | A5h | Checksum validity indicator |

Note: 1. F = The content of the word is fixed and does not change.
V = The content of the word is variable and may change depending on the state of the device or the commands executed by the device.
X = The content of the word may be fixed or variable.

Commands

Table 12: Supported ATA Command Set

See ATA-8 standard for command details

| Command Name | Command Code (hex) |
|--|--------------------|
| AMAC-GET NATIVE MAX ADDRESS EXT | 78h/0000h |
| AMAC-SET ACCESSIBLE MAX ADDRESS EXT | 78h/0001h |
| AMAC-FREEZE ACCESSIBLE MAX ADDRESS EXT | 78h/0002h |
| CHECK POWER MODE | E5h |
| DATA SET MANAGEMENT – TRIM | 06h/0001h |
| DOWNLOAD MICROCODE | 92h |
| DOWNLOAD MICROCODE DMA | 93h |
| EXECUTE DEVICE DIAGNOSTIC | 90h |
| FLUSH CACHE | E7h |
| FLUSH CACHE EXT | EAh |
| IDENTIFY DEVICE | ECh |
| IDLE | E3h |
| IDLE IMMEDIATE | E1h |
| INITIALIZE DEVICE PARAMETERS | 91h |
| NOP | 00h |
| READ BUFFER | E4h |
| READ BUFFER DMA | E9h |
| READ DMA (with retry) | C8h |
| READ DMA EXT | 25h |
| READ FPDMA QUEUED | 60h |
| READ LOG DMA EXT | 47h |
| READ LOG EXT | 2Fh |
| READ MULTIPLE | C4h |
| READ MULTIPLE EXT | 29h |
| READ SECTOR(S) EXT | 24h |
| READ SECTOR(S) (with retry) | 20h |
| READ VERIFY SECTOR EXT | 42h |
| READ VERIFY SECTOR(S) (with retry) | 40h |
| SANITIZE DEVICE | B4h |
| SECURITY DISABLE PASSWORD | F6h |
| SECURITY ERASE PREPARE | F3h |
| SECURITY ERASE UNIT | F4h |
| SECURITY FREEZE LOCK | F5h |
| SECURITY SET PASSWORD | F1h |
| SECURITY UNLOCK | F2h |
| SET FEATURES | EFh |

Table 12: Supported ATA Command Set (Continued)

See ATA-8 standard for command details

| Command Name | Command Code (hex) |
|--------------------------------------|--------------------|
| SET MULTIPLE MODE | C6h |
| SLEEP | E6h |
| SMART DISABLE OPERATIONS | B0h/D9h |
| SMART ENABLE OPERATIONS | B0h/D8h |
| SMART ENABLE/DISABLE AUTOSAVE | B0h/D2h |
| SMART EXECUTE OFF-LINE IMMEDIATE | B0h/D4h |
| SMART READ DATA | B0h/D0h |
| SMART READ DATA ATTRIBUTE THRESHOLDS | B0h/D1h |
| SMART READ LOG | B0h/D5h |
| SMART RETURN STATUS | B0h/DAh |
| SMART SAVE ATTRIBUTE VALUES | B0h/D3h |
| SMART WRITE LOG | B0h/D6h |
| STANDBY | E2h |
| STANDBY IMMEDIATE | E0h |
| WRITE BUFFER | E8h |
| WRITE BUFFER DMA | EBh |
| WRITE DMA (with retry) | CAh |
| WRITE DMA EXT | 35h |
| WRITE DMA FUA EXT | 3Dh |
| WRITE FPDMA QUEUED | 61h |
| WRITE LOG EXT | 3Fh |
| WRITE LOG DMA EXT | 57h |
| WRITE MULTIPLE | C5h |
| WRITE MULTIPLE EXT | 39h |
| WRITE MULTIPLE FUA EXT | CEh |
| WRITE SECTOR(S) (with retry) | 30h |
| WRITE SECTOR(S) EXT | 34h |
| WRITE UNCORRECTABLE EXT | 45h |

Table 13: Additional Command Set for TCG Drives

| Command Name | Command Code (hex) |
|---------------------|--------------------|
| TRUSTED NON-DATA | 5Bh |
| TRUSTED RECEIVE | 5Ch |
| TRUSTED RECEIVE DMA | 5Dh |
| TRUSTED SEND | 5Eh |
| TRUSTED SEND DMA | 5Fh |

Interface Connectors

2.5-Inch 7mm

Figure 3: 2.5-Inch 7mm SATA Interface Connections

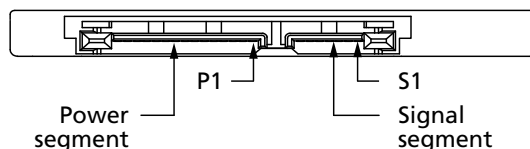


Table 14: Signal Segment Pin Assignments – 2.5-Inch SATA

| Signal Name | Type | Description |
|-------------|------|----------------------------|
| S1 | GND | Ground |
| S2 | A+ | Differential signal pair A |
| S3 | A– | |
| S4 | GND | Ground |
| S5 | B– | Differential signal pair B |
| S6 | B+ | |
| S7 | GND | Ground |

Table 15: Power Segment Pin Assignments – 2.5-Inch SATA

| Power Name | Type | Description |
|------------|---------|--------------------------|
| P1 | Retired | No connect |
| P2 | Retired | No connect |
| P3 | PWDIS | Enter/Exit Power Disable |
| P4 | GND | Ground |
| P5 | GND | Ground |
| P6 | GND | Ground |
| P7 | V5 | 5V power, precharge |
| P8 | V5 | 5V power |
| P9 | V5 | 5V power |
| P10 | GND | Ground |
| P11 | DAS | Device activity signal |
| P12 | GND | Ground |
| P13 | V12 | 12V power |
| P14 | V12 | 12V power |
| P15 | V12 | 12V power |

Physical Configuration

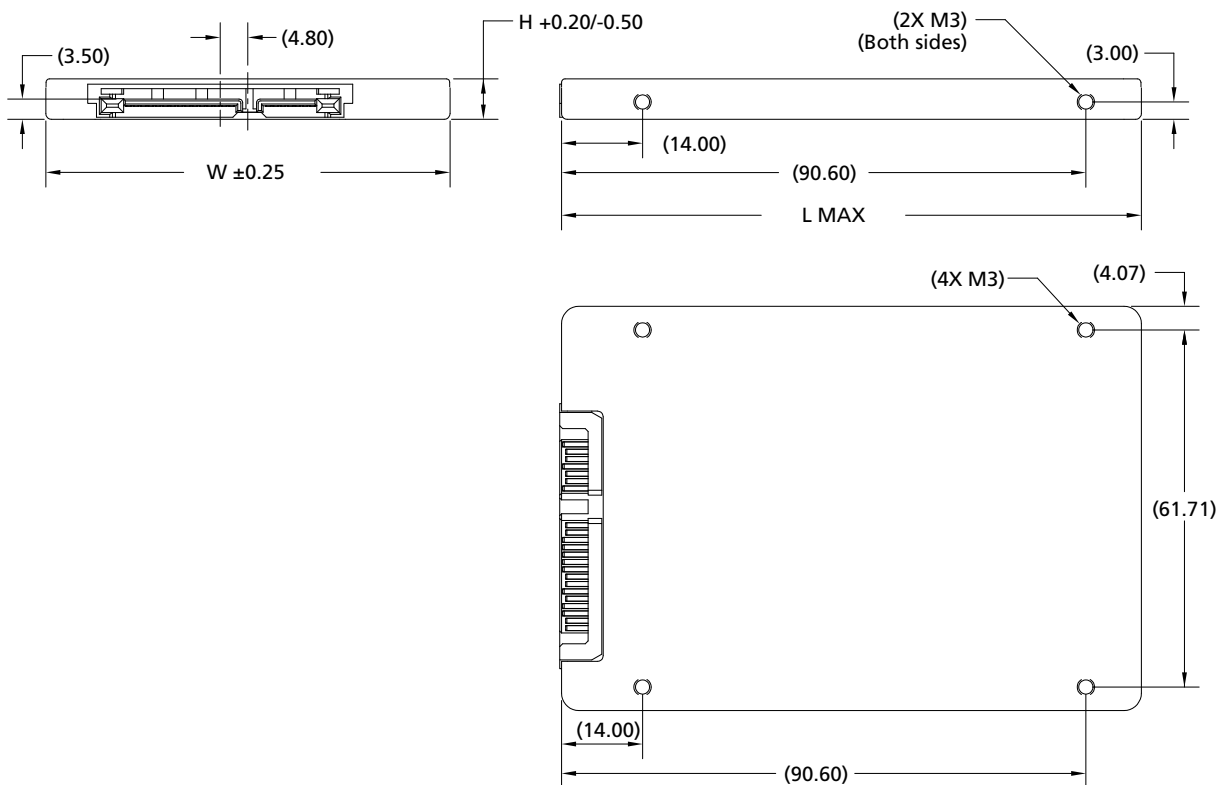
2.5-Inch 7mm

Product mass: less than 70 grams

Screw: M3 x 0.5 with a maximum of 5mm encroachment into the SSD

Torque: Maximum of 4 in-lbs @ 200 rpm with an actuation style lever

Figure 4: 2.5-Inch Package – 7mm



Note: 1. All dimensions are in millimeters.

Table 16: 2.5-Inch Package Dimensions

| Capacity (GB) | W | L | H | Unit |
|---------------|-------|--------|------|------|
| 240 | 69.85 | 100.45 | 7.00 | mm |
| 480 | | | | |
| 960 | | | | |
| 1920 | | | | |
| 3840 | | | | |
| 7680 | | | | |

Note: 1. Dimension values in millimeter per SFF 8201 Rev. 3.3.

Compliance

Micron SSDs comply with the following:

- Micron Green Standard
- Built with sulfur resistant resistors
- CE (Europe): EN 55032 Class B, RoHS
- FCC: CFR Title 47, Part 15 Class B
- UL/cUL: approval to UL-60950-1, 2nd Edition, IEC 60950-1:2005 (2nd Edition); EN 60950-1 (2006) + A11:2009+ A1:2010 + A12:2011 + A2:2013
- BSMI (Taiwan): approval to CNS 13438 Class B and CNS 15663
- RCM (Australia, New Zealand): AS/NZS CISPR32 Class B
- KC RRA (Korea): approval to KN32 Class B, KN 35 Class B

B 급 기기 이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거 (가정용 정보통신기기) 지역에서는 물론 모든 지역에서 사용할 수 있습니다.

- W.E.E.E.: compliance with EU WEEE directive 2012/19/EC. Additional obligations may apply to customers who place these products in the markets where WEEE is enforced.
- TUV (Germany): approval to IEC60950/EN60950
- VCCI (Japan): 2015-04 Class B

この装置は、クラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

- IC (Canada): ICES-003 Class B
 - This Class B digital apparatus complies with Canadian ICES-003.
 - Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
- Morocco: approval to EN55032/EN55024 Class B

FCC Rules

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

References

- Serial ATA: High-speed serialized AT attachment, Serial ATA working group, available at www.sata-io.org
- SATA 3.3 GOLD
- ATA-8 ACS-3 Revision 5
- SFF-8201 Rev. 3.3: For 2.5-Inch mechanical
- Trusted Computing Group (TCG) Enterprise Specification Version 1.00 Revision Final, Revision 3.00 January 10, 2011. Available at www.trustedcomputinggroup.org
- Trade Agreements Act of 1979 (19 U.S.C. 2501)

Revision History

Rev. E – 05/18

- Added 240GB MAX and 3840GB PRO configurations
- Updated Performance Table 3
- Updated Power Consumption Table 8

Rev. D – 04/18

- Added MAX configurations
- Added assembly recommendations
- Re-certified from Class A to Class B

Rev. C – 01/18

- Updated Shock Vibration table specifications
- Corrected 480GB ECO TBW rating in Drive Lifetime table
- Corrected Identify Device Word 235 value in Device ID

Rev. B – 12/17

- Removed the 480GB PRO option
- Updated Power Consumption specifications
- Updated Performance specifications

Rev. A – 10/17

- Initial release

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This data sheet contains minimum and maximum limits specified over the power supply and temperature range set forth herein.
Although considered final, these specifications are subject to change, as further product development and data characterization sometimes occur.