

C400 1.8-Inch SATA NAND Flash SSD

MTFDDAA128MAM, MTFDDAA256MAM, MTFDDAA512MAM

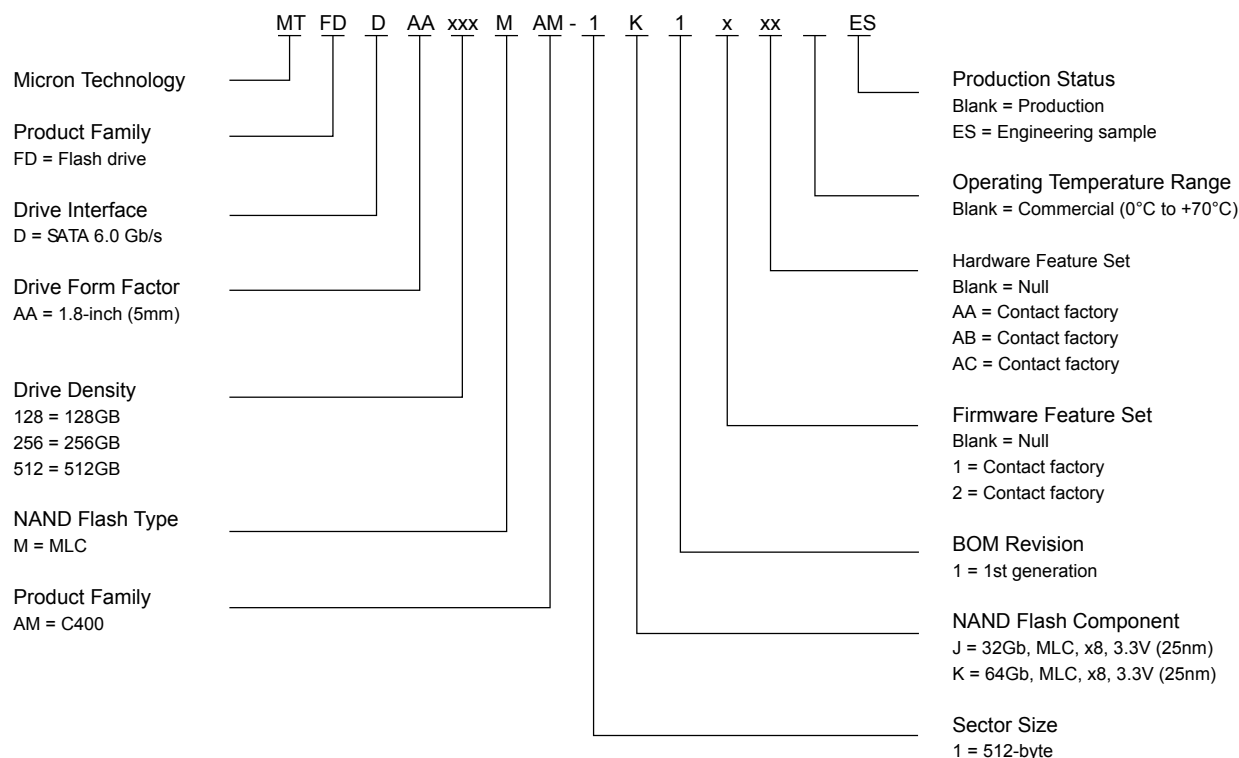
Features

- Micron® 25nm MLC NAND Flash
 - RoHS-compliant package
 - 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
 - Industry-standard, 512-byte sector size support
 - Hot-plug capable
 - Native command queuing support with 32-command slot support
 - ATA-8 ACS2 command set compliant
 - ATA security feature command set and password login support
 - Secure erase (data page) command set: fast and secure erase
 - Self-monitoring, analysis, and reporting technology (SMART) command set
 - Performance^{1, 2}
 - Sequential 128k READ: up to 500 MB/s
 - Sequential 128k WRITE: up to 260 MB/s
 - Random 4k READ: up to 45,000 IOPS
 - Random 4k WRITE: up to 50,000 IOPS
 - PCMark® Vantage (HDD test suite score): up to 75,000
 - READ/WRITE latency: 55µs (TYP)
 - Reliability
 - MTBF: 1.2 million device hours³
 - Static and dynamic wear leveling
 - Uncorrectable bit error rate (UBER): <1 sector per 10¹⁵ bits read
 - Low power consumption
 - <280mW TYP⁴
 - Endurance: Total bytes written (TBW) – 72TB
 - Capacity⁵ (unformatted): 128GB, 256GB, 512GB
 - Mechanical – 5mm height
 - Micro SATA connector: 3.3V ±5%
 - 1.8-inch drive: 78.5mm x 54mm x 5mm
 - Weight: 45g (MAX)
 - Field-updateable firmware
 - Operating temperature:
 - Commercial (0°C to +70°C)⁶
- Notes:
1. Typical I/O performance numbers as measured using Iometer with a queue depth of 32 and write cache enabled.
 2. 4K transfers used for READ/WRITE latency values.
 3. The product achieves a mean time between failure (MTBF) based on population statistics not relevant to individual units.
 4. Active power measured during execution of MobileMark® 2007 with DIPM (device-initiated power management) enabled.
 5. 1GB = 1 billion bytes; formatted capacity is less.
 6. Drive case temperature.

Part Numbering Information

Micron's RealSSD™ C400 SSD is available in different configurations and densities. Visit www.micron.com for a list of valid part numbers.

Figure 1: Part Number Chart



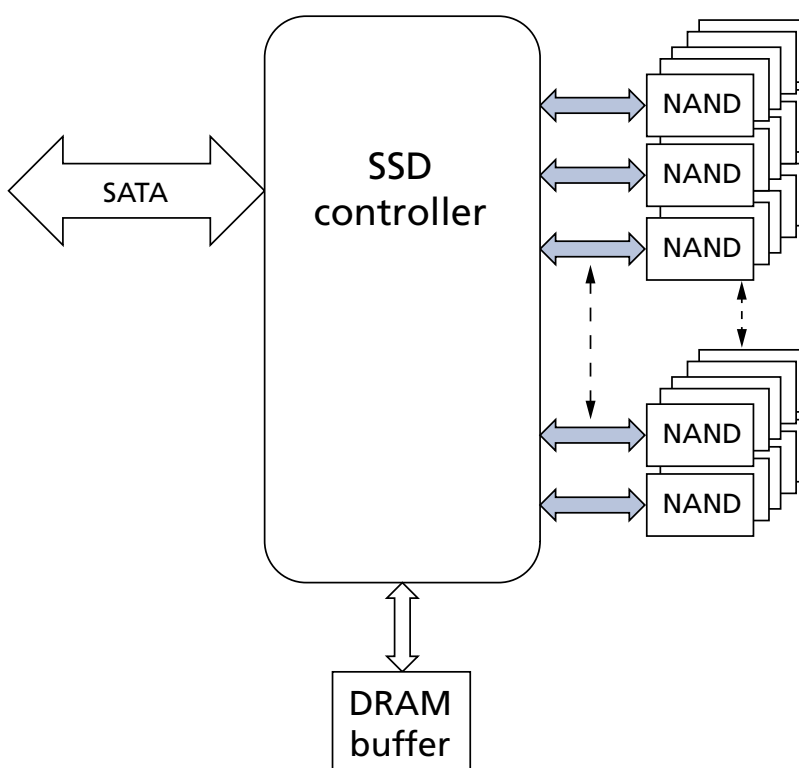
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General Description

Micron's RealSSD solid state drive (SSD) uses a single-chip controller with a SATA interface on the system side and n-channels of Micron NAND Flash internally. Packaged in an HDD replacement enclosure, 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.

Figure 2: Functional Block Diagram





Logical Block Address Configuration

The drive is set to report the number of logical block addresses (LBA) that will ensure sufficient storage space for the specified density. Standard LBA settings, based on the IDEMA standard (LBA1-02), are shown below.

Table 1: Standard LBA Settings

| Drive Size | Total LBA | | Max LBA | | User Available Bytes |
|------------|---------------|-------------|---------------|-------------|----------------------|
| | Decimal | Hexadecimal | Decimal | Hexadecimal | (Unformatted) |
| 128GB | 250,069,680 | EE7C2B0 | 250,069,679 | EE7C2AF | 128,035,676,160 |
| 256GB | 500,118,192 | 1DCF32B0 | 500,118,191 | 1DCF32AF | 256,186,209,271 |
| 512GB | 1,000,215,216 | 3B9E12B0 | 1,000,215,215 | 3B9E12AF | 512,110,190,592 |

Physical Configuration

Table 2: 1.8-Inch Dimensions and Weight

| | Value | Unit |
|-------------|-------|----------|
| Height | 5 | mm (NOM) |
| Width | 54 | mm (NOM) |
| Length | 78.5 | mm (NOM) |
| Unit weight | 45 | g (MAX) |

Interface Connectors

The SATA signal segment interface cable has four conductors and three ground connections. As shown in Package Dimensions, the cable includes a 7-pin signal segment and a 9-pin power segment arranged in a single row with a 1.27mm (0.050in) pitch.

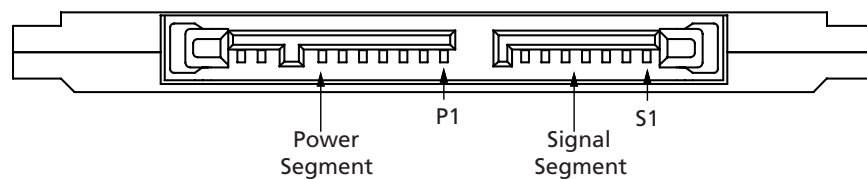
Table 3: SATA Signal Segment Pin Assignments

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

Table 4: 1.8-Inch SATA Power Segment Pin Assignments

| Pin# | Signal Name | Description |
|------|-------------|-------------|
| P1 | V33 | 3.3V power |
| P2 | V33 | 3.3V power |
| P3 | GND | Ground |
| P4 | GND | Ground |
| P5 | V5 | No connect |
| P6 | V5 | No connect |
| P7 | Reserved | No connect |
| Key | Key | Key |
| P8 | Optional | No connect |
| P9 | Optional | No connect |

Figure 3: SSD Interface Connections



Performance

Measured performance can vary for a number of reasons. The major factors affecting drive performance are the density of the drive and the interface 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.

Table 5: Drive Performance

| Density | 128GB | 256GB | 512GB | Unit |
|-----------------------|--------|--------|--------|-----------|
| Interface Speed | 6 Gb/s | 6 Gb/s | 6 Gb/s | |
| Sequential 128k read | 500 | 500 | 500 | MB/s |
| Sequential 128k write | 175 | 260 | 260 | MB/s |
| Random 4k read | 45,000 | 45,000 | 45,000 | IOPS |
| Random 4k write | 35,000 | 50,000 | 50,000 | IOPS |
| Read latency | 55 | 55 | 55 | μs |
| Write latency | 55 | 55 | 55 | μs |
| PCMark Vantage | 65,000 | 75,000 | 75,000 | HDD score |

- Notes:
1. Typical I/O performance numbers as measured using IOMeter with a queue depth of 32 and write cache enabled.
 2. IOMeter measurements are performed on an 8GB span.
 3. 4k transfers used for READ/WRITE latency values.
 4. System variations may affect measured results.

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 when it is read out of the SSD, the data differs from what was programmed.

Table 6: Uncorrectable Bit Error Rate

| Uncorrectable Bit Error Rate | Operation |
|-----------------------------------|-----------|
| <1 sector per 10^{15} bits read | READ |

Mean Time Between Failures

Mean time between failures (MTBFs) 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 7: MTBFs

| Density | MTBF (Operating Hours) ¹ |
|---------|-------------------------------------|
| 128GB | 1.2 million |
| 256GB | 1.2 million |
| 512GB | 1.2 million |

Note: 1. The product achieves a mean time between failure (MTBF) of 1.2 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. The table below shows the drive lifetime for each SSD density based on predefined usage conditions.

Table 8: Drive Lifetime

| Density | Drive Lifetime (Total Bytes Written) |
|---------|--------------------------------------|
| 128GB | 72TB |
| 256GB | 72TB |
| 512GB | 72TB |

- Notes:
1. Total bytes written calculated with the drive 90% full.
 2. Access patterns are 50% sequential and 50% random and consist of the following: 5% are 4k; 5% are 8k; 10% are 16k; 10% are 32k; 35% are 64K; and 35% are 128k.
 3. GB/day can be calculated by dividing the total bytes written value by (365 × number of years). For example: 72TB/5 years/365 days = 40 GB/day for 5 years.

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 9: SATA Power Consumption

| Density | Idle Average | Active Average | Sequential Write/Read Maximum (128k transfer) | | Unit |
|---------|--------------|----------------|--|------|------|
| 128GB | <85 | 150 | 3500 | 2000 | mW |
| 256GB | <85 | 160 | 4000 | 2200 | mW |
| 512GB | <100 | 280 | 5500 | 2500 | mW |

- Notes:
1. Data taken at 25°C using a 6 Gb/s SATA interface.
 2. Active average power measured while running MobileMark® 2007 Productivity Suite.
 3. DIPM (device-initiated power management) enabled.
 4. Sequential power measured in IOMETER MAX with 128KB transfer size.

Table 10: Maximum Ratings

| Parameter/Condition | Symbol | Min | Max | Unit |
|------------------------------------|----------------|------|------|---------|
| Voltage input | V33 | 3.14 | 3.46 | V |
| Operating temperature | T _C | 0 | 70 | °C |
| Non-operating temperature | | –40 | 85 | °C |
| Rate of temperature change | | – | 20 | °C/hour |
| Relative humidity (non-condensing) | | 5 | 95 | % |

- Note:
1. Temperature is best measured with a thermocouple attached to the center point of the exterior of the case on the side where the SATA connector is **not** visible. If necessary, contact with the drive label is acceptable.

Table 11: Shock and Vibration

| Parameter/Condition | Specification |
|---------------------|-----------------|
| Operating shock | 1500 G/1.0ms |
| Operating vibration | 2–500Hz at 3.1G |

Device ID

Table 12: 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 | F | 0b | 1 = removable media device |
| | 6 | F | 1b | Obsolete |
| | 5–3 | X | 000b | Retired |
| | 2 | V | 0b | Response incomplete |
| | 1 | X | 0b | Retired |
| | 0 | F | 0b | Reserved |
| 1 | | | 3FFFh | Obsolete |
| 2 | | F | C837h | Specific configuration |
| 3 | | F | 0010h | Obsolete |
| 4 | | F | 0000h 0000h | Retired |
| 6 | | F | 003Fh | Obsolete |
| 7 | | (O)V | 0000h 0000h | Reserved for assignment by the CompactFlash™ Association |
| 9 | | ()X | 0000h | Retired |
| 10 | | (M)F | varies | Serial number (20 ASCII characters) |
| 20 | | ()X | 0000h 0000h 0000h | Retired/obsolete |
| 23 | | (M)F | varies | Firmware revision (8 ASCII characters) |
| 27 | | (M)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 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13–1 | F | 0000000000000b | Reserved for the Trusted Computing Group |
| | 0 | F | 0b | 1 = Trusted computing feature set is support |

Table 12: 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 supported |
| | | | | 0 = IORDY may be supported |
| | 10 | F | 1b | 1 = IORDY may be disabled |
| | 9 | | 1b | 1 = LBA supported |
| | 8 | F | 1b | 1 = DMA supported. |
| | 7–0 | F | 00000000b | Retired |
| 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 | | ()X | 0000h 0000h | Obsolete |
| 53 | 15–3 | F | 000000000000b | Reserved |
| | 2 | F | 1b | 1 = Fields reported in word 88 are valid 0 = Fields reported in word 88 are not valid |
| | 1 | F | 1b | 1 = Fields reported in words (70:64) are valid 0 = Fields reported in words (70:64) are not valid |
| | 0 | X | 1b | Obsolete |
| 54 | | ()X | 3FFFh 0010h 003Fh FC10h 00FBh | Obsolete |
| 59 | 15 | F | 0b | 1 = The BLOCK ERASE EXT command is supported |
| | 14 | F | 0b | 1 = The OVERWRITE EXT command is supported |
| | 13 | F | 0b | 1 = The CRYPTO SCRAMBLE EXT command is supported |
| | 12 | F | 0b | 1 = The sanitize feature set is supported |
| | 11–9 | F | 000b | Reserved |
| | 8 | V | 1b | 1 = Multiple sector setting is valid |
| | 7–0 | V | 00000001b | xxh = Current setting for number of logical sectors that shall be transferred per DRQ data block on READ/WRITE MULTIPLE commands |
| 60 | | M(F) | Varies by capacity | Total number of user addressable logical sectors |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|---|
| 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 | 0000b | 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 | 15–8 | F | 0 | Reserved |
| | 7–0 | F | 03h | PIO modes 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 |
| 69 | | F | | Additional Supported |
| | 15 | F | 0b | 1 = CFast specification support |
| | 14 | F | 1b | 1 = Deterministic read after trim is supported |
| | 13 | F | 0b | 1 = Long physical sector alignment error reporting control is supported |
| | 12 | F | 0b | 1 = DEVICE CONFIGURATION IDENTIFY DMA and DEVICE CONFIGURATION SET DMA are supported |
| | 11 | F | 0b | 1 = READ BUFFER DMA is supported |
| | 10 | F | 0b | 1 = WRITE BUFFER DMA is supported |
| | 9 | F | 0b | 1 = SET MAX PASSWORD DMA and SET MAX UNLOCK DMA are supported |
| | 8 | F | 0b | 1 = DOWNLOAD MICROCODE DMA is supported |
| | 7 | F | 0b | Reserved for IEEE-1667 |
| | 6 | F | 0b | 1 = Optional ATA device 28-bit commands supported |
| | 5 | F | 0b | 1 = Read zero after trim is supported |
| | 4–0 | F | 00000b | Reserved |
| 70 | | F | 0000h | Reserved |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|----------------------------|--|
| 71 | | 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 |
| 76 | | | | Serial ATA capabilities |
| | 15–13 | F | 000b | Reserved |
| | 12 | F | 1b | Supports native command queuing priority information |
| | 11 | F | 0b | Supports unload while NCQ commands outstanding |
| | 10 | F | 1b | Supports Phy event counters |
| | 9 | F | 1b | Supports receipt of host initiated interface power management requests |
| | 8 | F | 1b | Supports native command queueing |
| | 7–4 | F | 0000b | Reserved for future Serial ATA signaling speed grades |
| | 3 | F | 1b | 1 = Supports Serial ATA Gen-3 speed (6.0 Gb/s) |
| | 2 | F | 1b | 1 = Supports Serial ATA Gen-2 speed (3.0 Gb/s) |
| | 1 | F | 1b | 1 = Supports Serial ATA Gen-1 speed (1.5 Gb/s) |
| | 0 | F | 0b | Reserved (set to 0) |
| 77 | | | | Serial ATA additional capabilities |
| | 15–6 | F | 0000000000b | Reserved for future Serial ATA definition |
| | 5 | F | 0b | Supports NCQ QUEUE MANAGEMENT command |
| | 4 | F | 0b | Supports NCQ streaming |
| | 3–1 | V | 010b | Coded value indicating current negotiated Serial ATA signal speed |
| | 0 | F | 0b | Shall be cleared to 0 |
| 78 | | | | Serial ATA features supported |
| | 15–7 | F | 000000000b | Reserved |
| | 6 | F | 1b | 1 = Supports software settings preservation |
| | 5 | F | 0b | Reserved |
| | 4 | F | 0b | 1 = Supports in-order data delivery |
| | 3 | F | 1b | 1 = Supports dev initiate interface power management |
| | 2 | F | 1b | 1 = Supports DMA Setup Auto-Activate optimization |
| | 1 | F | 0b | 1 = Supports non-zero buffer offsets in DMA Setup FIS |
| | 0 | F | 0b | Reserved (set to 0) |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 79 | | | | Serial ATA features enabled |
| | 15–7 | V | 000000000b | Reserved |
| | 6 | V | 1b | 1 = Software settings preservation enabled |
| | 5 | V | 0b | 1 = Asynchronous notification enabled |
| | 4 | V | 0b | 1 = In-order data delivery enabled |
| | 3 | V | 0b | 1 = Device initiating interface power management enabled |
| | 2 | V | 0b | 1 = DMA setup auto-activate optimization enabled |
| | 1 | V | 0b | 1 = Non-zero buffer offsets in DMA Setup FIS enabled |
| | 0 | V | 0b | Reserved (set to 0) |
| 80 | | | | Major revision number |
| | 15–10 | F | 000000b | Reserved |
| | 9 | F | 1b | 1 = Supports ATA8-ACS2 |
| | 8 | F | 1b | 1 = Supports ATA8-ACS |
| | 7 | F | 1b | 1 = Supports ATA/ATAPI-7 |
| | 6 | F | 1b | 1 = Supports ATA/ATAPI-6 |
| | 5 | F | 1b | 1 = Supports ATA/ATAPI-5 |
| | 4 | F | 1b | 1 = Supports ATA/ATAPI-4 |
| | 3 | F | 1b | Obsolete |
| | 2 | S | 0b | Obsolete |
| | 1 | S | 0b | Obsolete |
| | 0 | F | 0b | Reserved |
| 81 | | F | 0028h | Minor revision number |
| | | | | 0028h = ATA8-ACS version 6 |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 82 | | | | Command set supported |
| | 15 | X | 0b | Obsolete |
| | 14 | F | 1b | 1 = NOP command supported |
| | 13 | F | 1b | 1 = READ BUFFER command supported |
| | 12 | F | 1b | 1 = WRITE BUFFER command supported |
| | 11 | X | 0b | Obsolete |
| | 10 | F | 1b | 1 = Host protected area feature set supported |
| | 9 | F | 0b | 1 = DEVICE RESET command supported |
| | 8 | F | 0b | 1 = SERVICE interrupt supported |
| | 7 | F | 0b | 1 = release interrupt supported |
| | 6 | F | 1b | 1 = read look-ahead supported |
| | 5 | F | 1b | 1 = write cache 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 supported |
| | 2 | F | 0b | Obsolete |
| | 1 | F | 1b | 1 = Security feature set supported |
| | 0 | F | 1b | 1 = SMART feature set supported |
| 83 | | | | Command set supported |
| | 15 | F | 0b | Shall be cleared to 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13 | F | 1b | 1 = FLUSH CACHE EXT command supported |
| | 12 | F | 1b | 1 = Mandatory FLUSH CACHE command supported |
| | 11 | F | 1b | 1 = Device configuration overlay feature set supported |
| | 10 | F | 1b | 1 = 48-bit address feature set supported |
| | 9 | F | 0b | 1 = Automatic acoustic management feature set supported |
| | 8 | F | 1b | 1 = SET MAX security extension supported |
| | 7 | F | 0b | See address offset reserved area boot INCITS TR27:2001 |
| | 6 | F | 0b | 1 = SET FEATURES subcommand required to spin-up after power-up |
| | 5 | F | 0b | 1 = Power-up in standby feature set supported |
| | 4 | F | 0b | Obsolete |
| | 3 | F | 1b | 1 = Advanced power management feature set supported |
| | 2 | F | 0b | 1 = CFA feature set supported |
| | 1 | F | 0b | 1 = READ/WRITE DMA QUEUED supported |
| | 0 | F | 1b | 1 = DOWNLOAD MICROCODE command supported |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 84 | | | | Command set/feature supported extension |
| | 15 | F | 0b | Shall be cleared to 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13 | F | 1b | 1 = IDLE IMMEDIATE with UNLOAD FEATURE 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 | F | 00b | Obsolete |
| | 8 | F | 1b | 1 = 64-bit word wide name supported |
| | 7 | F | 0b | 1 = WRITE DMA QUEUED FUA EXT command supported |
| | 6 | F | 1b | 1 = WRITE DMA FUA EXT and WRITE MULTIPLE FUA EXT commands supported |
| | 5 | F | 1b | 1 = General purpose logging feature set supported |
| | 4 | F | 0b | 1 = Streaming feature set supported |
| | 3 | F | 0b | 1 = Media card pass through command feature set supported |
| | 2 | F | 0b | 1 = Media serial number supported |
| | 1 | F | 1b | 1 = SMART self-test supported |
| | 0 | F | 1b | 1 = SMART error logging supported |
| 85 | | | | Command set/feature enabled |
| | 15 | X | 0b | Obsolete |
| | 14 | F | 1b | 1 = NOP command supported |
| | 13 | F | 1b | 1 = READ BUFFER command supported |
| | 12 | F | 1b | 1 = WRITE BUFFER command supported |
| | 11 | X | 0b | Obsolete |
| | 10 | V | 1b | 1 = Host protected area feature set enabled |
| | 9 | F | 0b | 1 = DEVICE RESET command supported |
| | 8 | V | 0b | 1 = SERVICE interrupt enabled |
| | 7 | V | 0b | 1 = Release interrupt enabled |
| | 6 | V | 1b | 1 = Look-ahead enabled |
| | 5 | V | 1b | 1 = Write cache enabled |
| | 4 | F | 0b | Shall be cleared to zero to indicate that the PACKET feature set is not supported. |
| | 3 | F | 1b | Power management feature set is enabled |
| | 2 | F | 0b | Obsolete |
| | 1 | V | 0b | 1 = Security mode feature set enabled |
| | 0 | V | 1b | 1 = SMART feature set enabled |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|---|
| 86 | | | | Command set/feature enabled |
| | 15 | | 1b | 1 = Words 120–119 are valid |
| | 14 | F | 0b | 1 = Reserved |
| | 13 | F | 1b | 1 = FLUSH CACHE EXT command supported |
| | 12 | F | 1b | 1 = FLUSH CACHE command supported |
| | 11 | F | 1b | 1 = Device configuration overlay supported |
| | 10 | F | 1b | 1 = 48-bit address features set supported |
| | 9 | V | 0b | 1 = Automatic Acoustic management feature set enabled |
| | 8 | F | 0b | 1 = SET MAX security enabled by SET MAX SET PASSWORD |
| | 7 | F | 0b | Reserved for address offset reserved area boot, INCITS TR27:2001 |
| | 6 | F | 0b | 1 = SET FEATURES subcommand required to spin-up after power-up |
| | 5 | V | 0b | 1 = Power-up in standby feature set enabled |
| | 4 | V | 0b | Obsolete |
| | 3 | V | 1b | 1 = Advanced power management feature set enabled |
| | 2 | F | 0b | 1 = CFA feature set supported |
| | 1 | F | 0b | 1 = READ/WRITE DMA QUEUED command supported |
| | 0 | F | 1b | 1 = DOWNLOAD MICROCODE command supported |
| 87 | | | | Command set/feature enabled/supported |
| | 15 | F | 0b | Shall be cleared to 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13 | F | 1b | 1 = IDLE IMMEDIATE with UNLOAD FEATURE supported |
| | 12 | V | 0b | Reserved for technical report- INCITS tr-37-2004 (TLC) |
| | 11 | V | 0b | Reserved for technical report- INCITS TR-37-2004 (TLC) |
| | 10–9 | F | 00b | Obsolete |
| | 8 | F | 1b | 1 = 64-bit word wide name supported |
| | 7 | F | 0b | 1 = WRITE DMA QUEUED FUA EXT command supported |
| | 6 | F | 1b | 1 = WRITE DMA FUA EXT and WRITE MULTIPLE FUA EXT commands supported |
| | 5 | F | 1b | 1 = General purpose logging feature set supported |
| | 4 | V | 0b | Obsolete |
| | 3 | V | 0b | 1 = Media card pass through command feature set supported |
| | 2 | V | 0b | 1 = Media serial number is valid |
| | 1 | F | 1b | 1 = SMART self-test supported |
| | 0 | F | 1b | 1 = SMART error logging supported |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 88 | | | 0b | Ultra DMA modes |
| | 15 | | 0b | Reserved |
| | 14 | | 0b | 1 = Ultra DMA mode 6 is selected 0 = Ultra DMA mode 6 is not selected |
| | 13 | | 0b | 1 = Ultra DMA mode 5 is selected 0 = Ultra DMA mode 5 is not selected |
| | 12 | | 0b | 1 = Ultra DMA mode 4 is selected 0 = Ultra DMA mode 4 is not selected |
| | 11 | | 0b | 1 = Ultra DMA mode 3 is selected 0 = Ultra DMA mode 3 is not selected |
| | 10 | | 0b | 1 = Ultra DMA mode 2 is selected 0 = Ultra DMA mode 2 is not selected |
| | 9 | | 0b | 1 = Ultra DMA mode 1 is selected 0 = Ultra DMA mode 1 is not selected |
| | 8 | | 0b | 1 = Ultra DMA mode 0 is selected 0 = Ultra DMA mode 0 is not selected |
| | 7 | | 0b | Reserved |
| | 6 | | 0b | 1 = Ultra DMA mode 6 and below are supported |
| | 5 | | 1b | 1 = Ultra DMA mode 5 and below are supported |
| | 4 | | 1b | 1 = Ultra DMA mode 4 and below are supported |
| | 3 | | 1b | 1 = Ultra DMA mode 3 and below are supported |
| | 2 | | 1b | 1 = Ultra DMA mode 2 and below are supported |
| | 1 | | 1b | 1 = Ultra DMA mode 1 and below are supported |
| | 0 | | 1b | 1 = Ultra DMA mode 0 IS supported |
| 89 | | (O)F | 0001h | Time required for security erase unit completion |
| 90 | | (O)F | 0001h | Time required for enhanced security erase completion |
| 91 | | (O)V | 00FEh | Current advanced power management value |
| 92 | | (O)V | FFFEh | Master password revision code |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---------------|--|
| 93 | | | | Shall be 0000h for SATA devices |
| | 15 | | 0b | Shall be cleared to 0 |
| | 14 | | 0b | Shall be set to 1 |
| | 13 | | 0b | 1 = Device detected CBLID-above V_{IH} 0 = device detected CBLID-below V_{IL} |
| | | | | Device 1 hardware reset result Device 0 shall clear these bits to 0 Device 1 shall set these bits as follows: |
| | 12 | | 0b | Reserved |
| | 11 | | 0b | 0 = Device 1 did not assert PDIAG- 1 = Device 1 asserted PDIAG- |
| | 10–9 | | | These bits indicate how Device 1 determined the device number: 00 = Reserved 01 = A jumper was used 10 = The CSEL signal was used 11 = Some other method was used or the method is unknown |
| | 8 | | 0b | Shall be set to 1 |
| | | | | Device 0 hardware reset result. Device 1 shall clear these bits to zero. Device 0 shall set these bits as follows: |
| | 7 | | 0b | Reserved |
| | 6 | | 0b | 0 = Device 0 does not respond when Device 1 is selected 1 = Device 0 responds when Device 1 is selected |
| | 5 | | 0b | 0 = Device 0 did not detect the assertion of DASP- 1 = Device 0 detected the assertion of DASP- |
| | 4 | | 0b | 0 = Device 0 did not detect the assertion of PDIAG- 1 = Device 0 detected the assertion of PDIAG- |
| | 3 | | 0b | 0 = Device 0 failed diagnostics. 1 = Device 0 passed diagnostics |
| | 2–1 | | 00b | These bits indicate how Device 0 determined the device number: 00 = Reserved 01 = a jumper was used 10 = the CSEL signal was used 11 = some other method was used or the method is unknown |
| | 0 | | 0b | Shall be set to one |
| 94 | 15–8 | F | 00h | Vendor's recommended acoustic management value |
| | 7–0 | V | 00h | Current automatic acoustic management value |
| 95 | | (O)V | 0000h | Stream minimum request size |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|----------------------------|--|
| 96 | | (O)V | 0000h | Streaming transfer time - DMA |
| 97 | | (O)V | 0000h | Streaming access latency - DMA and PIO |
| 98 | | (O)F | 0000h 0000h | Streaming performance granularity(98-99) |
| 100 | | V | Varies by capacity | Maximum user LBA for 48-bit Address feature set |
| 104 | | (O)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 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13 | F | 0b | 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 | 0000b | 2^x logical sectors per physical sector |
| 107 | | (O)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 | | (M)F | Varies | 5-0 Unique ID (31-16) |
| 111 | | (M)F | Varies | Unique ID (15-0) |
| 112 | | (O)F | 0000h 0000h 0000h 0000h | Reserved for 128 bit world wide name extension to 128 bits |
| 116 | | (O)V | 0000h | Reserved for INCITS TR-37-2004 |
| 117 | | (O)F | 0000h 0000h | Words per logical sector |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|---|---|
| 119 | | | | Commands and feature sets supported (continued from words 84-82) |
| | 15 | F | 0b | Shall be cleared to 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13–6 | F | 00000001b | Reserved |
| | 5 | F | 0b | 1 = Free-fall control feature set is supported |
| | 4 | F | 1b | 1 = The DOWNLOAD MICROCODE command with mode 3 is supported |
| | 3 | F | 1b | 1 = READ LOG DMA EXT and WRITE LOG DMA EXT commands are supported |
| | 2 | F | 1b | 1 = The write-read-verify feature set is supported |
| | 1 | F | 1b | 1 = Feature set "Disable Data Transfer After Error Detection" is supported |
| | 0 | F | 0b | Reserved for DDT |
| 120 | | | | Commands and feature sets supported or enabled (continued from words 87-85) |
| | 15 | | 0b | Shall be cleared to 0 |
| | 14 | | 1b | Shall be set to 1 |
| | 13–6 | | 00000000b | Reserved |
| | 5 | | 0b | 1 = Free-fall control feature set is enabled |
| | 4 | | 1b | 1 = The DOWNLOAD MICROCODE command with mode 3 is supported |
| | 3 | | 1b | 1 = The READ LOG DMA EXT and WRITE LOG DMA EXT commands are supported |
| | 2 | | 1b | 1 = The WRITE UNCORRECTABLE EXT command is supported |
| | 1 | | 0b | 1 = The write-read-verify feature set is enabled |
| | 0 | | 0b | 1 = Feature set "Disable Data Transfer After Error Detection" is enabled 0 = Feature set "Disable Data Transfer After Error Detection" is disabled |
| 121 | | F | 0000h 0000h 0000h 0000h 0000h 0000h | Reserved for expanded supported and enabled settings |
| 127 | | (O) | 0000h | Obsolete |

Table 12: 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 | Security level 0 = High, 1 = Maximum |
| | 7–6 | F | 00b | Reserved |
| | 5 | F | 1b | 1 = Enhanced security erase supported |
| | 4 | V | 0b | 1 = Security count expired |
| | 3 | V | 0b | 1 = Security frozen |
| | 2 | V | 0b | 1 = Security locked |
| | 1 | V | 0b | 1 = Security enabled |
| | 0 | F | 1b | 1 = Security supported |
| 129 | | ()X | Vendor specific data | Vendor specific |
| 160 | | | | CFA power mode 1 |
| | 15 | F | 0b | Word 160 supported |
| | 14 | F | 0b | Reserved |
| | 13 | F | 0b | CFA power mode 1 is required for one or more commands implemented by the device |
| | 12 | V | 0b | CFA power mode 1 disabled |
| | 11–0 | F | 000000000000b | Maximum current in ma |
| 161 | | X | 0000h 0000h 0000h 0000h 0000h 0000h 0000h | Reserved for assignment by the CompactFlash Association |
| 168 | 15–4 | F | 000h | Reserved |
| | 3–0 | F | 4h | Device nominal form factor |
| 169 | | | | DATA SET MANAGEMENT command support |
| | 15–1 | F | 0000000000000000b | Reserved |
| | 0 | F | 1b | 1 = Trim bit in the DATA SET MANAGEMENT command is supported |
| 170 | | F | 0000h 0000h 0000h 0000h | Additional product identifier |
| 174 | | F | 0000h 0000h | Reserved |
| 176 | | (O)V | Varies | Current media serial number (60 ASCII characters) |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|-----------------|---|
| 206 | | | | SCT command transport |
| | 15–12 | X | 0000b | Vendor specific |
| | 11–6 | F | 000000b | Reserved |
| | 5 | F | 1b | SCT command transport data tables supported |
| | 4 | F | 1b | CT command transport features control supported |
| | 3 | F | 1b | SCT command transport error recovery control supported |
| | 2 | F | 1b | SCT command transport write same supported |
| | 1 | F | 0b | SCT command transport long sector access supported |
| | 0 | F | 1b | SCT command transport supported |
| 207 | | ()F | 0000h 0000h | Reserved for CE-ATA |
| 209 | | (O) | | Alignment of logical blocks within a larger physical block |
| | 15 | F | 0b | Shall be cleared to 0 |
| | 14 | F | 1b | Shall be set to 1 |
| | 13–0 | F | 00000000000000b | Logical sector offset within the first physical sector where the first logical sector is placed |
| 210 | | (O)V | 0000h 0000h | Write-read-verify sector count mode 3 only |
| 212 | | (O)F | 0000h 0001h | Verify sector count mode 2 only |
| 214 | | (O) | | NV cache capabilities |
| | 15–12 | F | 0000b | NV cache feature set version |
| | 11–8 | F | 0000b | NV cache power mode feature set version |
| | 7–5 | F | 000b | Reserved |
| | 4 | V | 0b | 1 = NV cache feature set enabled |
| | 3–2 | F | 00b | Reserved |
| | 1 | V | 0b | 1 = NV cache power mode feature set enabled |
| | 0 | F | 0b | 1 = NV cache power mode feature set supported |
| 215 | | (O)V | 0000h | NV cache size in logical blocks (LSW) |
| 216 | | (O)V | 0000h | NV cache size in logical blocks (MSW) |
| 217 | | (M)F | 0001h | Nominal media rotation rate (ATA8-ACS 1699-D Revision 6) |
| | | | | NV cache read transfer speed in MB/s (ATA8-ACS 1699-D Revision 3f) |
| 218 | | (O)V | 0000h | NV cache write transfer speed in MB/s |
| 219 | | | | NV cache options |
| | 15–8 | F | 00h | Reserved |
| | 7–0 | F | 00h | Device estimated time to spin up in seconds |
| 220 | 15–8 | F | 00h | Reserved |
| | 7–0 | V | 00h | Write-read-verify feature set current mode |
| 221 | | | 0000h | Reserved |

Table 12: Identify Device (Continued)

See Note 1 for setting definitions

| Word | Bit(s) | Setting | Default Value | Description |
|------|--------|---------|--|---|
| 222 | | | | Transport major revision number; 0000h or FFFFh = Device does not report version |
| | 15–12 | | 0001b | Transport Type - 0 = Parallel, 1 = Serial, 2-15 = Reserved Parallel (Type = 0) Serial (Type = 1) |
| | 11–6 | | 000000b | Reserved |
| | 5 | | 1b | Reserved SATA Rev 3.0 |
| | 4 | | 1b | Reserved SATA Rev 2.6 |
| | 3 | | 1b | Reserved SATA Rev 2.5 |
| | 2 | | 1b | Reserved SATA II: Extensions |
| | 1 | | 1b | Reserved SATA 1.0a |
| | 0 | | 1b | ATA8-APT ATA8-AST |
| 223 | | (M)F | 0000h | Transport minor revision number |
| 224 | | ()F | 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h | Reserved for CE-ATA |
| 234 | | (O)F | 0001h | Minimum number of 512 byte units per DOWNLOAD MI-CROCODE command for mode 3 |
| 235 | | | 00FFh | Maximum number of 512 byte units per DOWNLOAD MI-CROCODE command for mode 3 |
| 236 | | | 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h 0000h | Reserved |
| 255 | | (M)F | | Integrity word |
| | 15–8 | | varies | Checksum |
| | 7–0 | | A5h | Signature |

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.
R = The content of the word is reserved and will be zero.

Commands

Table 13: Supported ATA Command Set

See ATA-8 standard for command details

| Command Name | Command Code (hex) |
|------------------------------------|--|
| CHECK POWER MODE | 98h or E5h |
| DEVICE CONFIGURATION RESTORE | B1h/C1h |
| DEVICE CONFIGURATION FREEZE LOCK | B1h/C3h |
| DEVICE CONFIGURATION IDENTIFY | B1h/C1h |
| DEVICE CONFIGURATION SET | B1h/C3h |
| DOWNLOAD MICROCODE | 92h |
| EXECUTE DEVICE DIAGNOSTIC | 90h |
| FLUSH CACHE | E7h |
| FLUSH CACHE EXT | EAh |
| IDENTIFY DEVICE | ECh |
| IDLE | E3h or 97h |
| IDLE IMMEDIATE | E1h or 95h |
| INITIALIZE DEVICE PARAMETERS | 91h |
| NOP | 00h |
| READ BUFFER | E4h |
| READ DMA (with retry) | C8h |
| READ DMA (without retry) | C9h |
| READ DMA EXT | 25h |
| READ FPDMA QUEUED | 60h |
| READ LOG EXT | 2Fh |
| READ MULTIPLE | C4h |
| READ MULTIPLE EXT | 29h |
| READ NATIVE MAX ADDRESS | F8h |
| READ NATIVE MAX ADDRESS EXT | 27h |
| READ SECTOR(S) EXT | 24h |
| READ SECTOR(S) (with retry) | 20h |
| READ SECTOR(S) (without retry) | 21h |
| READ VERIFY SECTOR EXT | 42h |
| READ VERIFY SECTOR(S) (with retry) | 40h |
| SCT WRITE SAME | 02h/0001h 02h/0002h 02h/0101h 02h/0102h |
| SCT RETURN ERROR RECOVERY CONTROL | 030h/01h |
| SCT SET ERROR RECOVERY CONTROL | 03h/01h |
| SCT SET FEATURE CONTROL | 04h/01h |
| SCT RETURN FEATURE CONTROL | 04h/02h |

Table 13: Supported ATA Command Set (Continued)

See ATA-8 standard for command details

| Command Name | Command Code (hex) |
|----------------------------------|--------------------|
| SCT RETURN FEATURE OPTION FLAG | 04h/03h |
| SCT RETURN SCT DATA TABLE | 05h/01h |
| SECURITY DISABLE PASSWORD | F6h |
| SECURITY ERASE PREPARE | F3h |
| SECURITY ERASE UNIT | F4h |
| SECURITY FREEZE LOCK | F5h |
| SECURITY SET PASSWORD | F1h |
| SECURITY UNLOCK | F2h |
| SEEK | 7xh |
| SET FEATURES | EFh |
| SET MAX ADDRESS | F9h |
| SET MAX – FREEZE LOCK | F9h/04h |
| SET MAX – LOCK | F9h/02h |
| SET MAX ADDRESS EXT | 37h |
| SET MULTIPLE MODE | C6h |
| SET MAX – SET PASSWORD | F9h/01h |
| SET MAX – UNLOCK | F9h/03h |
| SLEEP | E6h or 99h |
| 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 LOG SECTOR | B0h/D5h |
| SMART RETURN STATUS | B0h/DAh |
| SMART WRITE LOG | B0h/D6h |
| STANDBY | E2h or 96h |
| STANDBY IMMEDIATE | E0h or 94h |
| WRITE BUFFER | E8h |
| WRITE DMA (with retry) | CAh |
| WRITE DMA (without retry) | CBh |
| WRITE DMA EXT | 35h |
| WRITE DMA FUA EXT | 3Dh |
| WRITE FPDMA QUEUED | 61h |
| WRITE LOG EXT | 3Fh |
| WRITE MULTIPLE | C5h |
| WRITE MULTIPLE EXT | 39h |

Table 13: Supported ATA Command Set (Continued)

See ATA-8 standard for command details

| Command Name | Command Code (hex) |
|------------------------------|--------------------|
| WRITE MULTIPLE FUA EXT | CEh |
| WRITE SECTOR(S) (with retry) | 30h |
| WRITE SECTOR(S) EXT | 34h |
| WRITE UNCORRECTABLE EXT | 45h |

Compliance

Micron SSDs comply with the following:

- RoHS “green”
- CE (Europe): EN55022, 2006 Class B and EN55024, 1998 + A1: 2001 + A2:2003
- FCC: CFR Title 47, Part 15, ICES-003, all Class B
- UL (US): approval to UL-60950-1, 2nd Edition, 2007-03-27, IEC 60950-1:2005, 2nd Edition
- BSMI (Taiwan): approval to CNS 13438
- C-TICK (Australia, New Zealand): approval to AS/NZS CISPR22
- KCC RRL (Korea): approval to KCC MU2-C30025, KCC MU2-C30018 Class B
- W.E.E.E.: Compliance with EU WEEE directive 2002/96/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
- IC (Canada):
 - 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.

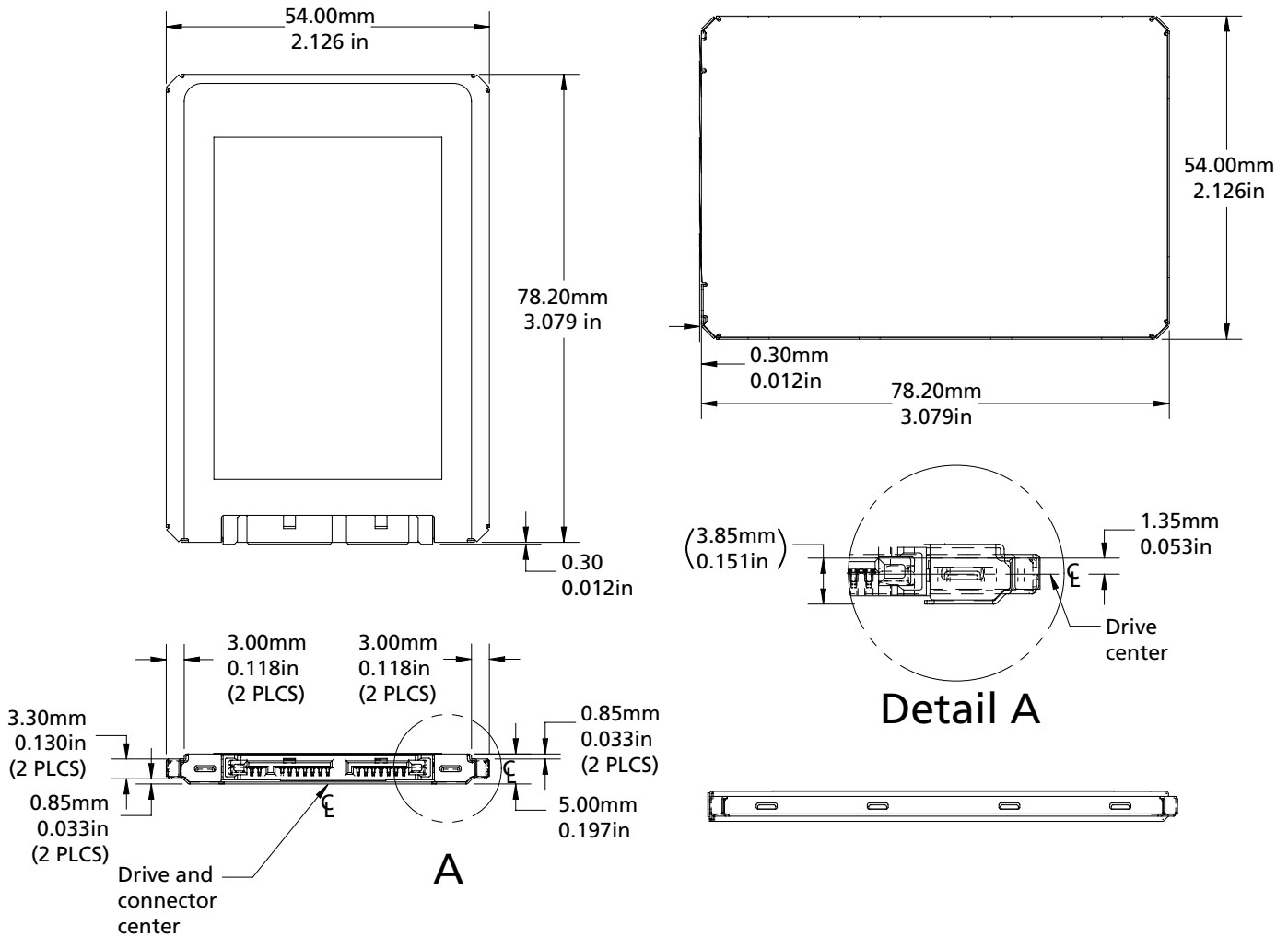
FCC Rules

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.

Package Dimensions

Figure 4: 1.8-Inch Package



References

- Serial ATA: High-speed serialized AT attachment, Serial ATA working group, available at www.sata-io.org
- SATA 3.0 GOLD
- ATA-8 ACS2

Revision History

Rev. D – 09/11

- Added FCC rules to Compliance

Rev. C – 09/11

- Updated Performance specifications in Features
- Updated Drive Performance table values in Performance
- Updated Electrical Specifications
- Updated word 85, bit 0b to 1b (SMART feature set enabled) in Device ID

Rev. B – 06/11

- Clarified temperature specification
- Clarified performance test conditions for data transfer sizes
- On Part Number Chart, changed the “Drive Form Factor” indicator from “AC” to “AA” in the example

Rev. A, Preliminary – 02/11

- Initial release

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