

Intel® Solid-State Drive 310 Series

SSDMAEMC040G2XX, SSDMAEMC080G2XX

Product Specification

- Capacity: 40 GB, 80 GB
- Components: Intel® 34nm NAND Flash Memory Multi-Level Cell (MLC)
- Read and Write IOPS (Iometer* Queue Depth 32)
 - 40 GB
 - Random 4 KB reads: Up to 25 K IOPS
 - Random 4 KB writes: Up to 2.5 K IOPS
 - 80 GB
 - Random 4 KB reads: Up to 35 K IOPS
 - Random 4 KB writes: Up to 6.6 K IOPS
- Bandwidth Performance
 - 40 GB
 - Sustained sequential read: Up to 170 MB/s
 - Sustained sequential write: Up to 35 MB/s
 - 80 GB
 - Sustained sequential read: Up to 200 MB/s
 - Sustained sequential write: Up to 70 MB/s
- Latency
 - 40 GB
 - Read: 65 µs (TYP)
 - Write: 110 µs (TYP)
 - 80 GB
 - Read: 65 µs (TYP)
 - Write: 75 µs (TYP)
- Compatibility
 - Intel® SSD Toolbox with Intel® SSD Optimizer
 - Intel® Rapid Storage Technology
 - SATA Revision 2.6; compatible with SATA 1.5 Gb/s and 3 Gb/s interface rates
 - ATA/ATAPI-7
 - SSD-enhanced S.M.A.R.T. ATA feature set
 - Native Command Queuing (NCQ) command set
 - Data set management command Trim attribute
- Form Factor: Full-sized mSATA
 - Dimensions: 50.80 mm by 29.85 mm
 - Thickness: < 4.85 mm
 - Weight: < 10 grams
- Power Management
 - 3.3 V mSATA supply rail
 - SATA interface power management
- Power (MobileMark* 2007 Workload)
 - Active: 150 mW (TYP)
 - Idle: 75 mW (TYP)
- Temperature
 - Operating: 0° C to 70° C
 - Non-Operating: -55° C to 95° C
- Shock (operating and non-operating)
 - 1,500 G/0.5 msec
- Vibration
 - Operating: 2.17 GRMS (5-700 Hz)
 - Non-operating: 3.13 GRMS (5-800 Hz)
- Reliability
 - Unrecoverable Read Bit Error Rate (UBER): 1 sector per 10¹⁶ bits read
 - Mean Time Between Failures (MTBF): 1,200,000 hours
- Certifications and Declarations
 - UL*
 - CE*
 - C-Tick*
 - BSMI*
 - KCC*
 - Microsoft* WHQL
 - VCCI*
 - SATA-IO*
- Product Ecological Compliance
 - EU RoHS*
 - Halogen-free



Ordering Information

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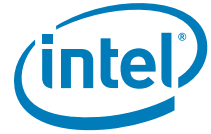
Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm>

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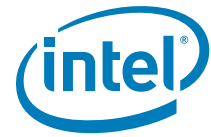
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1.0 Overview

This document describes the specifications and capabilities of the Intel® Solid-State Drive 310 Series (Intel® SSD 310 Series).

The Intel SSD 310 Series delivers compact storage and optimized performance for traditional and innovative small-form-factor and embedded platforms in two capacity sizes: 40 GB and 80 GB.

By combining Intel's leading 34nm NAND flash memory technology with our innovative high-performance controller, the Intel SSD 310 Series delivers capacity and performance similar to the Intel 34nm 40 GB and 80 GB 2.5-inch SSD products in a fraction of the size.

The case-less mSATA (mini-SATA) design has a significantly smaller footprint than a 2.5-inch hard disk drive (HDD), and enables fast read/write access times and a significant I/O and throughput performance improvement as compared to HDDs. This design makes it ideal for new and innovative small form factor computing platforms that have size and weight requirements that traditional 2.5-inch or 1.8-inch HDDs cannot meet; such as, netbooks, thin-and-light systems, mini- and sub-notebooks, all-in-one computers, and embedded platforms.

As compared to standard mobile HDDs, the Intel SSD 310 Series offers these key features:

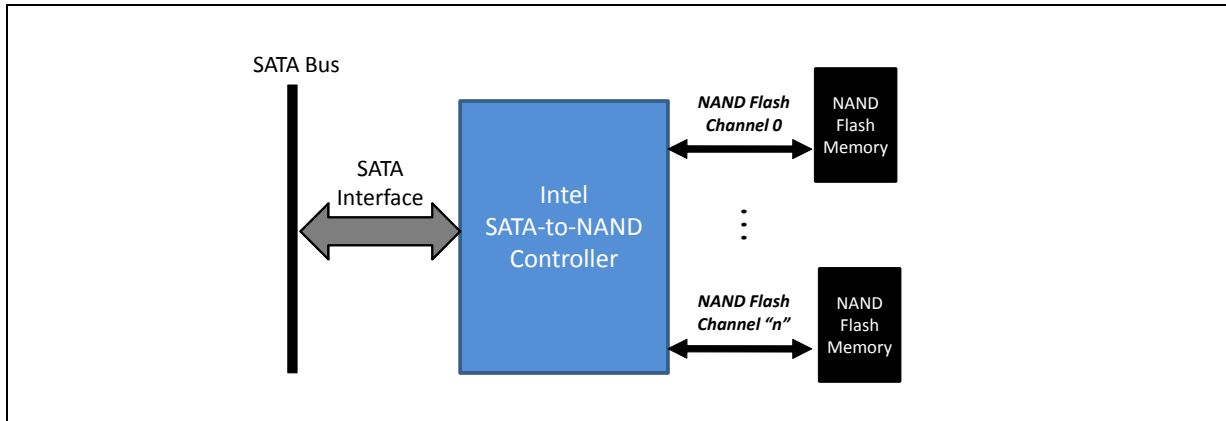
- High performance
- Low power
- Increased system responsiveness
- High reliability
- Small form-factor
- Minimum weight
- Enhanced ruggedness

2.0 Architecture

The Intel SSD 310 Series is electrically and software-compatible with existing full-sized mSATA interfaces.

The Intel SSD 310 Series utilizes a cost-effective, high-performance Intel SATA-to-NAND controller to manage a full SATA 3 Gb/s bandwidth with the host while managing multiple NAND flash memory devices on multiple channels.

Figure 1. Block Diagram





3.0 Product Specifications

This section provides details on the Intel SSD 310 Series product specifications.

3.1 Capacity

Table 1. User Addressable Sectors

| Unformatted Capacity | 40 GB | 80 GB |
|--|------------|-------------|
| Total User Addressable Sectors in LBA Mode | 78,165,360 | 156,301,488 |

Notes: LBA count shown represents total user storage capacity and will remain the same throughout the life of the drive. The total usable capacity of the SSD may be less than the total physical capacity because a small portion of the capacity is used for NAND flash management and maintenance purposes.
1 GB = 1,000,000,000 bytes; 1 sector = 512 bytes.

3.2 Performance

Table 2. Read/Write IOPS, Bandwidth, Latency

| Performance | 40 GB | 80 GB |
|--|-------------------|------------------|
| Random Read/Write IOPS (Input/Output Operations per Second) ¹ | | |
| 4K Read | Up to 25,000 | Up to 35,000 |
| 4K Write | Up to 2,500 | Up to 6,600 |
| Maximum Sustained Read and Write Bandwidth ² | | |
| Sequential Read | Up to 170 MB/s | Up to 200 MB/s |
| Sequential Write | Up to 35 MB/s | Up to 70 MB/s |
| Latency ³ | | |
| Read | 65 μ s (TYP) | 65 μ s (TYP) |
| Write | 110 μ s (TYP) | 75 μ s (TYP) |
| Power On to Ready | 1.50 s (TYP) | 1.50 s (TYP) |

Notes:

- Performance measured using Iometer* with queue depth set to 32; Measurements are performed on 8 GB of LBA range. Write Cache enabled.
- Performance measured using Iometer with queue depth equal to 32. Sequential performance measurements assume 1 MB/sec = 1,048,576 bytes/sec.
- Device measured using Iometer; Read/Write latency measured on sequential 4 K transfers with queue depth set to 1. Write Cache Enabled. Power On To Ready time measured from power rail rising edge to the first DRDY issued from the drive.

3.3 Electrical

Table 3. Operating Voltage and Power Consumption

| Electrical Characteristics | 40 GB | 80 GB |
|--------------------------------------|-------|--------|
| Operating Voltage for 3.3 V (+/- 5%) | | |
| Min | | 3.14 V |
| Max | | 3.47 V |
| Power Consumption (Typical) | | |
| Active ¹ | | 150 mW |
| Idle ² | | 75 mW |

Notes:

- Active power measured during execution of MobileMark* 2007 with DIPM (Device Initiated Power Management) enabled.
- Idle power defined as SSD at idle with DIPM enabled.



3.4 Environmental Conditions

Table 4. Temperature, Shock, Vibration

| Temperature | Range |
|---|--|
| Ambient Temperature Operating Non-operating | 0 - 70 °C -55 - 95 °C |
| Temperature Gradient ¹ Operating Non-operating | 20 (Typical) °C/hr 30 (Typical) °C/hr |
| Humidity Operating Non-operating | 5 - 95 % 5 - 95 % |
| Shock, Vibration, Acoustics | Range |
| Shock ² Operating Non-operating | 1,500 G (Max) at 0.5 msec 1,500 G (Max) at 0.5 msec |
| Vibration ³ Operating Non-operating | 2.17 GRMS (5-700 Hz) Max 3.13 GRMS (5-800 Hz) Max |

Notes:

1. Temperature gradient measured without condensation.
2. Shock specifications assume the SSD is mounted securely with the input vibration applied to the drive-mounting screws. Stimulus may be applied in the X, Y or Z axis. Shock specification is measured using root mean square (RMS) value.
3. Vibration specifications assume the SSD is mounted securely with the input vibration applied to the drive-mounting screws. Stimulus may be applied in the X, Y or Z axis. The measured specification is in root mean squared form. Vibration specification is measured using RMS value.

3.5 Electromagnetic Immunity

The Intel SSD 310 Series will operate properly without errors or degradation in performance when subjected to radio frequency (RF) environments referenced in the international specifications noted in the documents in [Table 5](#).

Electromagnetic Immunity tests assume the SSD is properly installed in the representative host system.

Table 5. Electromagnetic Immunity and Compliance Specifications

| Title | Description | Region for which conformity declared |
|----------------------------------|---|--------------------------------------|
| IEC 60950-1 - 1st Edition | Safety of Information Technology Equipment | International |
| UL/CSA 60950-1 Edition | Safety of Information Technology Equipment | USA/Canada |
| EN 60950-1:2001 | Safety of Information Technology Equipment | European Union |
| cTick | The EMC Framework (Radio Communication Act 1992) | Australia |
| FCC, 47 CFR Part 15 | Radio Frequency Devices - Subpart B - Unintentional Radiators B | USA |
| ICES-003 Issue 4 - February 2004 | Interface-Causing Equipment Standards - Digital Apparatus B | Canada |
| BSMI CNS14348; CNS14266 | Bureau of Standards, Metrology and Inspection, Ministry of Economic Affairs Electromagnetic Compatibility | Taiwan |


Table 5. Electromagnetic Immunity and Compliance Specifications (Continued)

| Title | Description | Region for which conformity declared |
|--------------------|--|--------------------------------------|
| EN 55022 and 55024 | EN 55022:2006 Information Technology Equipment - Radio Disturbance Characteristics B; EN 55024:1998 +A1:2001 +A2:2003 Information Technology Equipment - Immunity Characteristics | European Union |
| CISPR 22:2005 | Information Technology Equipment - Radio Disturbance Characteristics B | International |
| EN61000 | EN61000-3-2 Information Technology Equipment - Harmonics Characteristics; EN61000-3-3 Information Technology Equipment - Flicker Characteristics | European Union |
| VCCI CISPR22 B | Information Technology Equipment - Radio Disturbance Characteristics | Japan |
| KCC | Framework Act on Telecommunications and Radio Waves Act | Korea |

3.6 Reliability

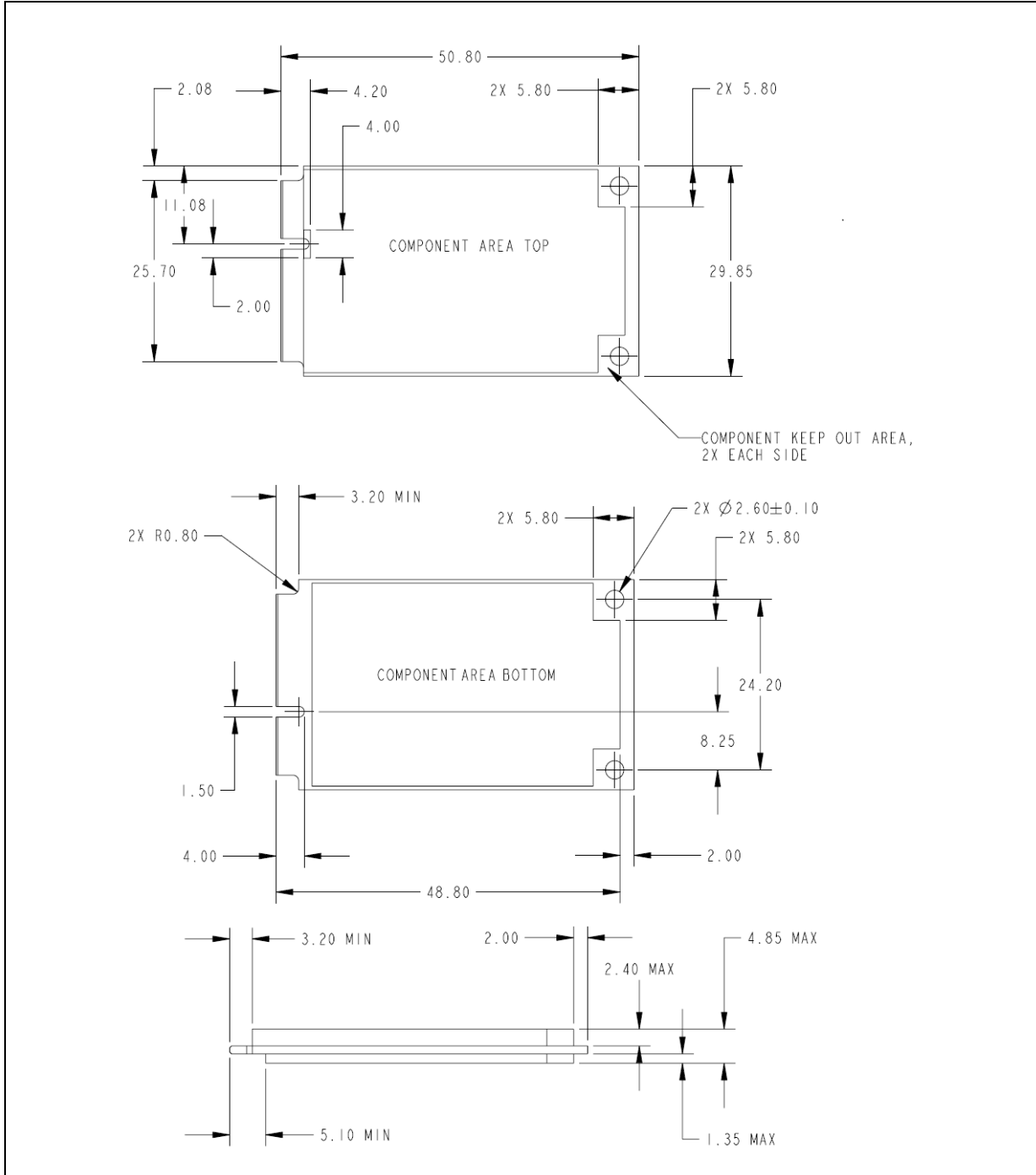
Table 6. Reliability Specifications

| Parameter | Value |
|---|--------------------------------------|
| Unrecoverable Read Bit Error Rate Unrecoverable read bit error rate will not exceed one sector in the specified number of bits read. In the extremely unlikely event of a nonrecoverable read error, the SSD will report it as a read failure to the host; the sector in error is considered corrupt and is not returned to the host. | 1 sector in 10^{16} bits read, max |
| Mean Time Between Failure (MTBF) Mean Time Between Failure (MTBF) is estimated based on Telcordia* methodology and demonstrated through Reliability Demonstration Test (RDT). | 1,200,000 hours |
| Power On/Off Cycles Power On/Off Cycles is defined as power being removed from the Intel SSD 310, and then restored. Most host systems remove power from the SSD when entering suspend and hibernate as well as on a system shutdown. | 50,000 cycles |
| Minimum Useful Life The Intel SSD 310 will have a minimum of five years of useful life under typical client workloads with up to 20 GB of host writes per day. | 5 years |

4.0 Mechanical Information

Figure 2 shows the physical dimension of the Intel SSD 310 Series. All dimensions are in millimeters.

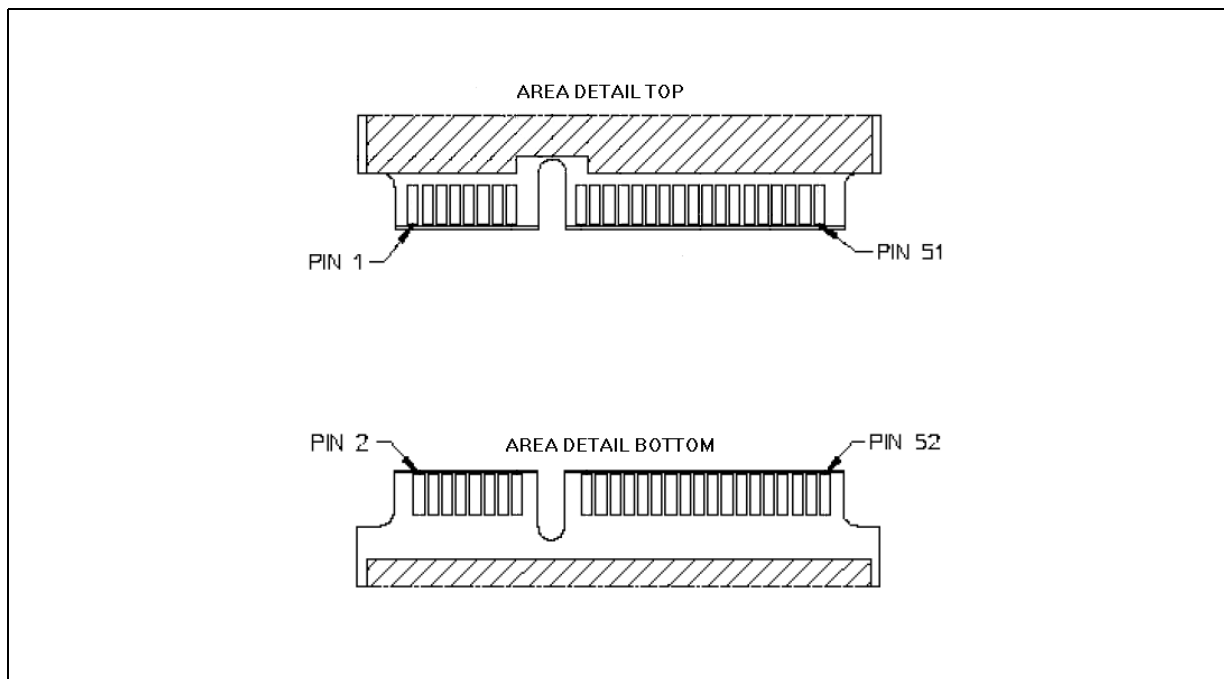
Figure 2. Intel SSD 310 Dimensions



5.0 Pin and Signal Descriptions

5.1 Pin Locations

Figure 3. Signal and Power Segment Pins



5.2 Signal Descriptions

Table 7. Connector Pin Signal Definitions

| Pin | Function | Definition |
|-----|----------|---------------------|
| P1 | Reserved | No Connect |
| P2 | +3.3 V | 3.3 V Source |
| P3 | Reserved | No Connect |
| P4 | GND | Return Current Path |
| P5 | Reserved | No Connect |
| P6 | +1.5 V | 1.5 V Source |
| P7 | Reserved | No Connect |
| P8 | Reserved | No Connect |
| P9 | GND | Return Current Path |
| P10 | Reserved | No Connect |
| P11 | Reserved | No Connect |
| P12 | Reserved | No Connect |
| P13 | Reserved | No Connect |
| P14 | Reserved | No Connect |
| P15 | GND | Return Current Path |
| P16 | Reserved | No Connect |
| P17 | Reserved | No Connect |



Table 7. Connector Pin Signal Definitions (Continued)

| Pin | Function | Definition |
|-----|--------------------|---|
| P18 | GND | Return Current Path |
| P19 | Reserved | No Connect |
| P20 | Reserved | No Connect |
| P21 | GND | Return Current Path |
| P22 | Reserved | No Connect |
| P23 | +B | Host Receiver Differential Signal Pair This is an output of the SSD. |
| P24 | +3.3 V | 3.3 V Source |
| P25 | -B | Host Receiver Differential Signal Pair This is an output of the SSD. |
| P26 | GND | Return Current Path |
| P27 | GND | Return Current Path |
| P28 | +1.5 V | 1.5 V Source |
| P29 | GND | Return Current Path |
| P30 | Two Wire Interface | Two Wire Interface Clock ¹ |
| P31 | -A | Host Transmitter Differential Signal Pair This is an input of the SSD. |
| P32 | Two Wire Interface | Two Wire Interface Data ¹ |
| P33 | +A | Host Transmitter Differential Signal Pair This is an input of the SSD. |
| P34 | GND | Return Current Path |
| P35 | GND | Return Current Path |
| P36 | Reserved | No Connect |
| P37 | GND | Return Current Path |
| P38 | Reserved | No Connect |
| P39 | +3.3 V | 3.3 V Source |
| P40 | GND | Return Current Path |
| P41 | +3.3 V | 3.3 V Source |
| P42 | Reserved | No Connect |
| P43 | Reserved | No Connect |
| P44 | Reserved | No Connect |
| P45 | Vendor | Vendor Specific / Manufacturing Pin ² |
| P46 | Reserved | No Connect |
| P47 | Vendor | Vendor Specific / Manufacturing Pin ² |
| P48 | +1.5 V | 1.5 V Source |
| P49 | DA/DSS | Device Activity Signal / Disable Staggered Spin-up |
| P50 | GND | Return Current Path |
| P51 | Presence Detection | Shall be pulled to GND by device ³ |
| P52 | +3.3 V | 3.3 V Source |

Notes:

1. Pins 30 and 32 are intended for use as a two-wire interface to read a memory device to determine device information (an example of this would be for use as SMB bus pins). These pins are not designed to be active in conjunction with the SATA signal differential pairs.
2. No connect on the host side.
3. Presence detection pin provided for tamper-proof functionality.



6.0 Supported Command Sets

The Intel SSD 310 Series supports ATA (Advanced Technology Attachment) commands described in this section.

6.1 ATA General Feature Command Set

The Intel SSD 310 Series supports the ATA General Feature command set (non-PACKET), which consists of:

- EXECUTE DEVICE DIAGNOSTIC
- FLUSH CACHE
- IDENTIFY DEVICE

Note: See [Appendix A, "IDENTIFY DEVICE Command Data"](#) on page 19 for details on the sector data returned after issuing an IDENTIFY DEVICE command.

- READ DMA
- READ SECTOR(S)
- READ VERIFY SECTOR(S)
- SEEK
- SET FEATURES
- WRITE DMA
- WRITE SECTOR(S)
- READ MULTIPLE
- SET MULTIPLE MODE
- WRITE MULTIPLE

The Intel SSD 310 Series also supports the following optional commands:

- READ BUFFFER
- WRITE BUFFER
- NOP
- DOWNLOAD MICROCODE

6.2 Power Management Command Set

The Intel SSD 310 Series supports the Power Management command set, which consists of:

- CHECK POWER MODE
- IDLE
- IDLE IMMEDIATE
- SLEEP
- STANDBY
- STANDBY IMMEDIATE



6.3 Security Mode Feature Set

The Intel SSD 310 Series supports the Security Mode command set, which consists of:

- SECURITY SET PASSWORD
- SECURITY UNLOCK
- SECURITY ERASE PREPARE
- SECURITY ERASE UNIT
- SECURITY FREEZE LOCK
- SECURITY DISABLE PASSWORD

6.4 SMART Command Set

The Intel SSD 310 Series supports the SMART command set, which consists of:

- SMART ENABLE OPERATIONS
- SMART DISABLE OPERATIONS
- SMART ENABLE/DISABLE AUTOSAVE
- SMART RETURN STATUS

The Intel SSD 310 Series also supports the following optional commands:

- SMART EXECUTE OFF-LINE IMMEDIATE
- SMART READ DATA
- SMART READ LOG
- SMART WRITE LOG

6.5 Data Set Management Command Set

The Intel SSD 310 Series supports the Data Set Management command set Trim attribute, which consists of:

- DATA SET MANAGEMENT EXT

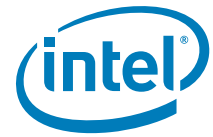
6.6 Host Protected Area Command Set

The Intel SSD 310 Series supports the Host Protected Area command set, which consists of:

- READ NATIVE MAX ADDRESS
- SET MAX ADDRESS
- READ NATIVE MAX ADDRESS EXT
- SET MAX ADDRESS EXT

The Intel SSD 310 Series also supports the following optional commands:

- SET MAX SET PASSWORD
- SET MAX LOCK
- SET MAX FREEZE LOCK
- SET MAX UNLOCK



6.7 48-Bit Address Command Set

The Intel SSD 310 Series supports the 48-bit Address command set, which consists of:

- FLUSH CACHE EXT
- READ DMA EXT
- READ NATIVE MAX ADDRESS EXT
- READ SECTOR(S) EXT
- READ VERIFY SECTOR(S) EXT
- SET MAX ADDRESS EXT
- WRITE DMA EXT
- WRITE MULTIPLE EXT
- WRITE SECTOR(S) EXT
- WRITE UNCORRECTABLE EXT

6.8 Device Configuration Overlay Command Set

The Intel SSD 310 Series supports the Device Configuration Overlay command set, which consists of:

- DEVICE CONFIGURATION FREEZE LOCK
- DEVICE CONFIGURATION IDENTITY
- DEVICE CONFIGURATION RESTORE
- DEVICE CONFIGURATION SET

6.9 General Purpose Log Command Set

The Intel SSD 310 Series supports the General Purpose Log command set, which consists of:

- READ LOG EXT
- WRITE LOG EXT

6.10 Native Command Queuing

The Intel SSD 310 Series supports the Native Command Queuing (NCQ) command set, which includes:

- READ FPDMA QUEUED
- WRITE FPDMA QUEUED

Note: With a maximum queue depth equal to 32.

6.11 Software Settings Preservation

The Intel SSD 310 Series supports the SET FEATURES parameter to enable/disable the preservation of software settings.

6.12 Device Initiated Power Management (DIPM)

The Intel SSD 310 Series supports the SET FEATURES parameter to enable Device Initiated Power Management.



7.0 Certifications and Declarations

Table 8 describes the Device Certifications supported by the Intel SSD 310 Series.

Table 8. Device Certifications and Declarations

| Certification | Description |
|------------------|---|
| CE Compliant | Indicates conformity with the essential health and safety requirements set out in European Directives Low Voltage Directive and EMC Directive. |
| UL Certified | Underwriters Laboratories, Inc. Component Recognition UL60950-1. |
| C-Tick Compliant | Compliance with the Australia/New Zealand Standard AS/NZS3548 and Electromagnetic Compatibility (EMC) Framework requirements of the Australian Communication Authority (ACA). |
| BSMI Compliant | Compliance to the Taiwan EMC standard "Limits and methods of measurement of radio disturbance characteristics of information technology equipment, CNS 13438 Class B." |
| KCC | Compliance with paragraph 1 of Article 11 of the Electromagnetic Compatibility control Regulation and meet the Electromagnetic Compatibility (EMC) Framework requirements of the Radio Research Laboratory (RRL) Ministry of Information and Communication Republic of Korea. |
| Microsoft WHQL | Microsoft Windows Hardware Quality Labs |
| RoHS Compliant | Restriction of Hazardous Substance Directive |
| VCCI | Voluntary Control Council for Interface to cope with disturbance problems caused by personal computers or facsimile. |
| SATA-IO | Indicates certified logo program from Serial ATA International Organization. |

8.0 References

Table 9 identifies the standards information referenced in this document.

Table 9. Standards References

| Date or Rev. # | Title | Location |
|--|--|---|
| June 2009 | Halogen-free (Applies to halogenated flame retardants and PVC in components) | Search for material description datasheet at http://qdms.intel.com/ |
| Dec 2008 | VCCI | http://www.vcci.jp/vcci_e/ |
| June 2009 | RoHS | Search for material description datasheet at http://qdms.intel.com/ |
| June 2007 | Intel® Rapid Storage Technology | http://support.intel.com/support/chipsets/imsm/ |
| February 2007 | Serial ATA Revision 2.6 | http://www.sata-io.org |
| April 2004 | ATA/ATAPI-7 | http://www.t10.org/t13/project/d1532v1r4a-ATA-ATAPI-7.pdf |
| 1995 1996 1995 1995 1997 1994 | International Electrotechnical Commission EN 61000 4-2 (Electrostatic discharge immunity test) 4-3 (Radiated, radio-frequency, electromagnetic field immunity test) 4-4 (Electrical fast transient/burst immunity test) 4-5 (Surge immunity test) 4-6 (Immunity to conducted disturbances, induced by radio-frequency fields) 4-11 (Voltage Variations, voltage dips, short interruptions and voltage variations immunity tests) | http://www.iec.ch |
| 1995 | ENV 50204 (Radiated electromagnetic field from digital radio telephones) | http://www.dbicorporation.com/radimmun.htm |



9.0 Additional Product Information

For additional information about the Intel SSD 310 Series, see the documentation in [Table 10](#).

Table 10. Related Documentation

| Order Number | Title |
|--------------|---|
| 322737 | Intel® High Performance SATA Solid State Drive S.M.A.R.T. Features – 34nm Product Line User Guide |

10.0 Terms and Acronyms

Table 11 defines the terms and acronyms used in this document.

Table 11. Glossary of Terms and Acronyms

| Term | Definition |
|--------|---|
| ATA | Advanced Technology Attachment |
| ATAPI | Advanced Technology Attachment Packet Interface |
| BER | Bit error rate Percentage of bits that have errors relative to the total number of bits received. |
| DIPM | Device Initiated Power Management |
| DMA | Direct Memory Access |
| EXT | Extended |
| FPDMA | First Party Direct Memory Access |
| GB | Gigabyte Note: The total usable capacity of the Intel SSD 310 may be less than the total physical capacity because a small portion of the capacity is used for NAND flash management and maintenance purposes. |
| Gb | Gigabit |
| GND | Ground |
| HDD | Hard Disk Drive |
| KB | Kilobytes |
| I/O | Input/Output |
| IOPS | Input/Output Operations Per Second |
| IO RDY | Input/Output Ready |
| ISO | International Standards Organization |
| LBA | Logical Block Address |
| MB | Megabytes (1x10 ⁶ bytes) |
| mSATA | Mini-SATA |
| MLC | Multi-level Cell |
| MTBF | Mean Time Between Failures |
| NCQ | Native Command Queuing |
| NOP | No Operation |
| PIO | Programmed Input/Output |
| RDT | Reliability Demonstration Test |
| RF | Radio frequency |



Table 11. Glossary of Terms and Acronyms (Continued)

| Term | Definition |
|-------|--|
| RMS | Root Mean Square |
| RoHS | Restriction of Hazardous Substances |
| SATA | Serial Advanced Technology Attachment |
| SMART | Self-Monitoring, Analysis and Reporting Technology An open standard for developing hard drives and software systems that automatically monitors the health of a drive and reports potential problems. |
| SSD | Solid-State Drive |
| TYP | Typical |
| VCCI | Voluntary Control Council for Interface |
| WHQL | Microsoft* Windows Hardware Quality Labs |

11.0 Revision History

| Date | Revision | Description |
|----------------|----------|---|
| January 2011 | 005 | Changed documentation status from Preliminary to Production. |
| November 2010 | 004 | Added specifications for Power, Latency (Power On to Ready, 40GB), and Power Consumption. Added Electromagnetic Immunity and Compliance Specifications in Table 5 . Moved Identify Device Command Data section to Appendix A. |
| September 2010 | 003 | Added latency, temperature, shock, and vibration specifications to Table 4 . |
| July 2010 | 002 | Clarified Transmit/Receive pair direction in Table 7 . |
| June 2010 | 001 | Initial release. |



Appendix A IDENTIFY DEVICE Command Data

Table 12 details the sector data returned after issuing an IDENTIFY DEVICE command.

Table 12. Returned Sector Data

| Word | F = Fixed V = Variable X = Both | Default Value | Description |
|-------|---------------------------------------|------------------------------------|--|
| 0 | F | 0040h | General configuration bit-significant information |
| 1 | X | 3FFFh | Obsolete - Number of logical cylinders (16,383) |
| 2 | V | C837h | Specific configuration |
| 3 | X | 0010h | Obsolete - Number of logical heads (16) |
| 4-5 | X | 0h | Retired |
| 6 | X | 003Fh | Obsolete - Number of logical sectors per logical track (63) |
| 7-8 | V | 0h | Reserved for assignment by the CompactFlash* Association (CFA) |
| 9 | X | 0h | Retired |
| 10-19 | F | Varies | Serial number (20 ASCII characters) |
| 20-21 | X | 0h | Retired |
| 22 | X | 0h | Obsolete |
| 23-26 | F | Varies | Firmware revision (8 ASCII characters) |
| 27-46 | F | Varies | Model number (Intel® Solid-State Drive) |
| 47 | F | 8010h | 7:0—Maximum number of sectors transferred per interrupt on MULTIPLE commands |
| 48 | F | 0h | Reserved |
| 49 | F | 2F00h | Capabilities |
| 50 | F | 4000h | Capabilities |
| 51-52 | X | 0h | Obsolete |
| 53 | F | 0007h | Words 88 and 70:64 Valid |
| 54 | X | 3FFFh | Obsolete - Number of logical cylinders (16,383) |
| 55 | X | 0010h | Obsolete - Number of logical heads (16) |
| 56 | X | 003Fh | Obsolete - Number of logical sectors per logical track (63) |
| 57-58 | X | FC100FBh | Obsolete |
| 59 | F | 0101h | Number of sectors transferred per interrupt on MULTIPLE commands |
| 60-61 | F | 40GB: 04A8B570h 80GB: F8B00950h | Total number of user-addressable sectors |
| 62 | X | 0h | Obsolete |
| 63 | F | 0007h | Multi-word DMA modes supported/selected |
| 64 | F | 0003h | PIO modes supported |
| 65 | F | 0078h | Minimum Multiword DMA transfer cycle time per word |
| 66 | F | 0078h | Manufacturer's recommended Multiword DMA transfer cycle time |
| 67 | F | 0078h | Minimum PIO transfer cycle time without flow control |
| 68 | F | 0078h | Minimum PIO transfer cycle time with IORDY flow control |
| 69 | F | 4020h | Command overlap and queuing |
| 70 | F | 0h | Reserved |



Table 12. Returned Sector Data (Continued)

| Word | F = Fixed V = Variable X = Both | Default Value | Description |
|---------|---------------------------------------|--|--|
| 71-74 | F | 0h | Reserved for the IDENTIFY PACKET DEVICE command |
| 75 | F | 001Fh | Queue depth |
| 76 | F | 0506h | Serial ATA capabilities |
| 77 | F | 0h | Reserved for future Serial ATA definition |
| 78 | F | 0048h | Serial ATA features supported |
| 79 | V | 0040h | Serial ATA features enabled |
| 80 | F | 00FCh | Major version number |
| 81 | F | 001Ah | Minor version number |
| 82 | F | 746Bh | Command set supported |
| 83 | F | 7D01h | Command sets supported |
| 84 | F | 6163h | Command set/feature supported extension |
| 85 | V | 7469h | Command set/feature enabled |
| 86 | V | BC01h | Command set/feature enabled |
| 87 | V | 6163h | Command set/feature default |
| 88 | V | 007Fh | Ultra DMA Modes |
| 89 | F | 0001h | Time required for security erase unit completion |
| 90 | F | 0001h | Time required for enhanced security erase completion |
| 91 | V | 0h | Current advanced power management value |
| 92 | V | FFFEh | Master Password Revision Code |
| 93 | F | 0h | Hardware reset result: the contents of bits (12:0) of this word shall change only during the execution of a hardware reset |
| 94 | V | 0h | Vendor's recommended and actual acoustic management value |
| 95 | F | 0h | Stream minimum request size |
| 96 | V | 0h | Streaming transfer time - DMA |
| 97 | V | 0h | Streaming access latency - DMA and PIO |
| 98-99 | F | 0h | Streaming performance granularity |
| 100-103 | V | 40GB: 04A8B57000000000h 80GB: F8B0095000000000h | Maximum user LBA for 48-bit address feature set |
| 104 | V | 0h | Streaming transfer time - PIO |
| 105 | F | 0008h | Maximum number of 512-byte blocks of LBA range entries per DATA SET MANAGEMENT command |
| 106 | F | 4000h | Physical sector size / logical sector size |
| 107 | F | 0h | Inter-seek delay for ISO-7779 acoustic testing in microseconds |
| 108-111 | F | Varies | Unique ID |
| 112-115 | F | 0h | Reserved for world wide name extension to 128 bits |
| 116 | V | 0h | Reserved for technical report |
| 117-118 | F | 0h | Words per logical sector |
| 119 | F | 401Ch | Supported settings |
| 120 | F | 401Ch | Command set/feature enabled/supported |



Table 12. Returned Sector Data (Continued)

| Word | F = Fixed V = Variable X = Both | Default Value | Description |
|---------|---------------------------------------|---------------|---|
| 121-126 | F | 0h | Reserved |
| 127 | F | 0h | Removable Media Status Notification feature set support |
| 128 | V | 0021h | Security status |
| 129-159 | X | 0h | Vendor specific |
| 160 | F | 0h | CompactFlash Association (CFA) power mode 1 |
| 161-168 | X | 0h | Reserved for assignment by the CFA |
| 169 | X | 0001h | Data set management Trim attribute support |
| 170-175 | X | 0h | Reserved for assignment by the CFA |
| 176-205 | V | 0h | Current media serial number |
| 206-216 | F | 0h | Reserved |
| 217 | F | 0001h | Nominal Media Rotational Rate |
| 218-221 | F | 0h | Reserved |
| 222 | F | 101F | Reserved |
| 223-233 | F | 0h | Reserved |
| 234 | | 0001h | Reserved |
| 235 | | 01F0h | Reserved |
| 236-254 | F | 0h | Reserved |
| 255 | X | Varies | Integrity word (Checksum and Signature) |

Notes: **F = Fixed.** The content of the word is fixed and does not change. For removable media devices, these values may change when media is removed or changed.

V = Variable. The state of at least one bit in a word is variable and may change depending on the state of the device or the commands executed by the device.

X = F or V. The content of the word may be fixed or variable.