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 G_{RMS} (5-700 Hz)
  — Non-operating: 3.13 G_{RMS} (5-800 Hz)
- Reliability
  — Uncorrectable Bit Error Rate (UBER): 1 sector per 10^{16} 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*
  — Low Halogen**

Ordering Information

Contact your local Intel sales representative for ordering information.

Contents

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
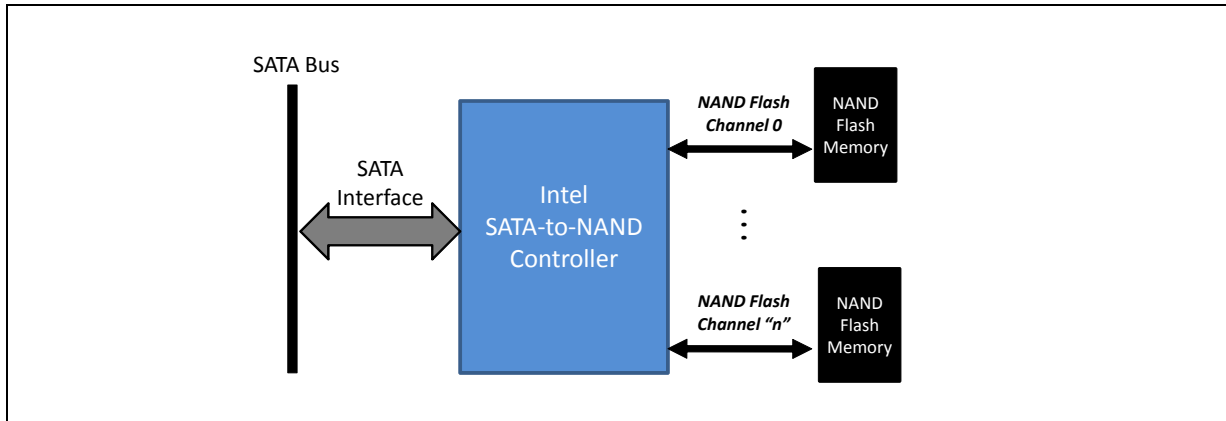
3.0 Product Specifications

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
     4K Write
	
	 Up to 25,000
	 Up to 2,500
		
		 Up to 35,000
		 Up to 6,600

Maximum Sustained Read and Write Bandwidth[2]
     Sequential Read
     Sequential Write
	
	 Up to 170 MB/s
	 Up to 35 MB/s
		
		 Up to 200 MB/s
		 Up to 70 MB/s

Latency[3]
     Read
     Write
     Power On to Ready
	
	 65 µs (TYP)
	 110 µs (TYP)
	 1.50 s (TYP)
		
		 65 µs (TYP)
		 75 µs (TYP)
		 1.50 s (TYP)

Notes:

1. Performance measured using Iometer* with queue depth set to 32; Measurements are performed on 8 GB of LBA range. Write Cache enabled.

2. Performance measured using Iometer with queue depth equal to 32.
Sequential performance measurements assume 1 MB/sec = 1,048,576 bytes/sec.

3. 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
    Max
	3.14 V
	3.47 V	

Power Consumption (Typical)
    Active[1]
    Idle[2]
	150 mW
	75 mW	

Notes:
1.   Active power measured during execution of MobileMark* 2007 with DIPM (Device Initiated Power Management) enabled.
2.   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 Product Regulatory Compliance

The Intel SSD 310 Series meets or exceeds the regulatory or certification requirements in Table 5.

Table 5.   Product Regulatory Compliance Specifications

Title	Description	Region for which conformity declared
European Union Low Voltage Directive (LVD) 2006/95/EC	EN 60950-1 2nd edition for Information Technology Equipment - Safety - Part 1: General Requirements	European Union
UL/CSA 60950-1, Second Edition CAN/CSA-C22.2 No. 60950-1-07 Second Edition	Information Technology Equipment - Safety - Part 1: General Requirements	USA/Canada
CFR Title 47 Part 15	Radio Frequency Devices - Subpart B (Unintentional Radiators)	USA
ICES-003 Issue 4	Interference Causing Equipment Standard	Canada
EN 55022:2006	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	European Union
CNS 14348:2006	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	Taiwan
VCCI V3/2010.04	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	Japan
KN22 (2008-5)	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	Korea
CISPR 22:2006	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	International
EN 55024:1998	Information technology equipment - Immunity characteristics - Limits and methods of measurement (CISPR 24:1997, modified)	European Union
KN24 (2008-5)	Information technology equipment - Immunity characteristics - Limits and methods of measurement (CISPR 24:1997, modified)	Korea

3.6 Reliability

Table 6. Reliability Specifications

Parameter	Value
Uncorrectable Bit Error Rate (UBER) 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
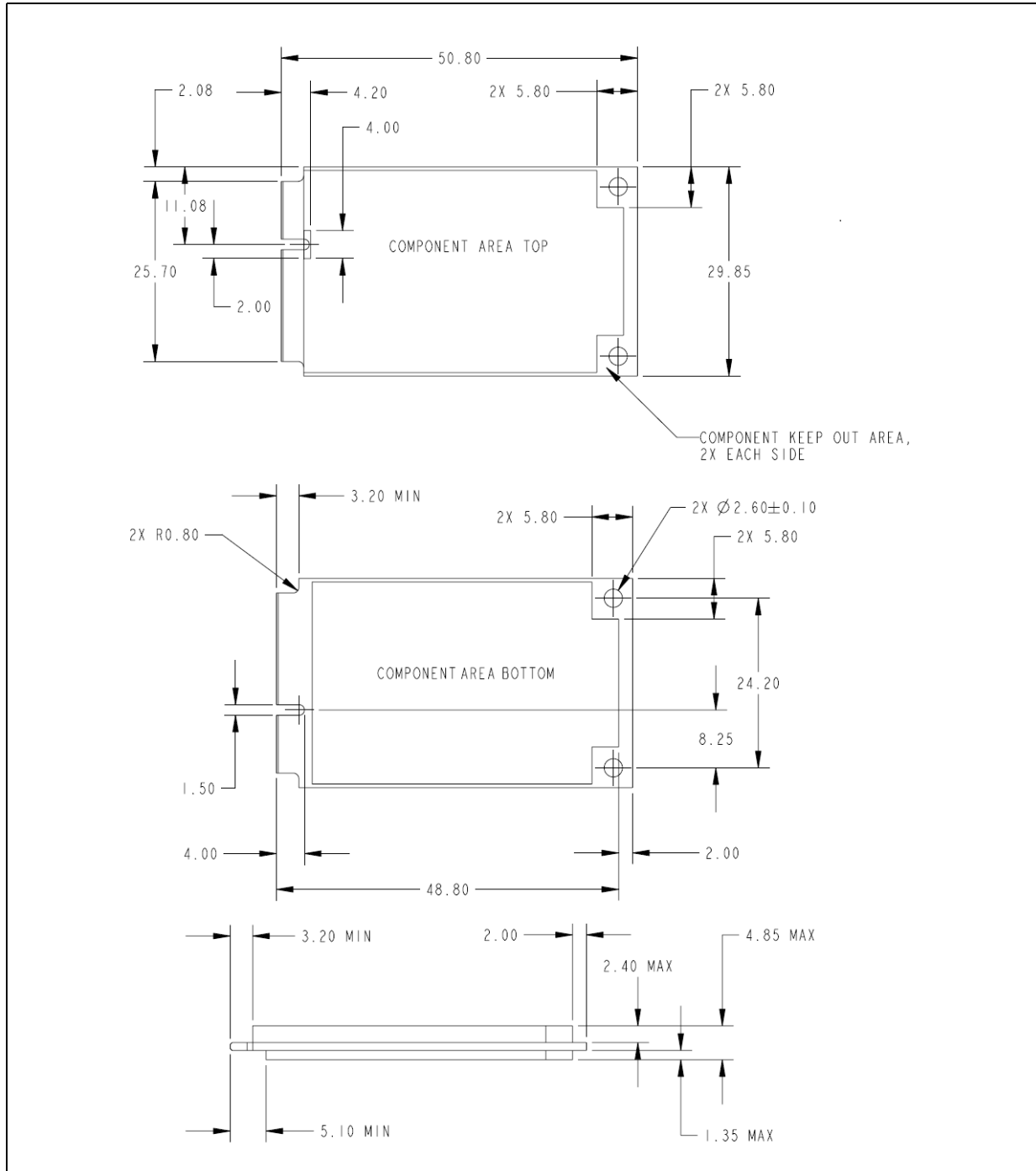
5.0 Pin and Signal Descriptions

5.1 Pin Locations

Figure 3. Signal and Power Segment Pins
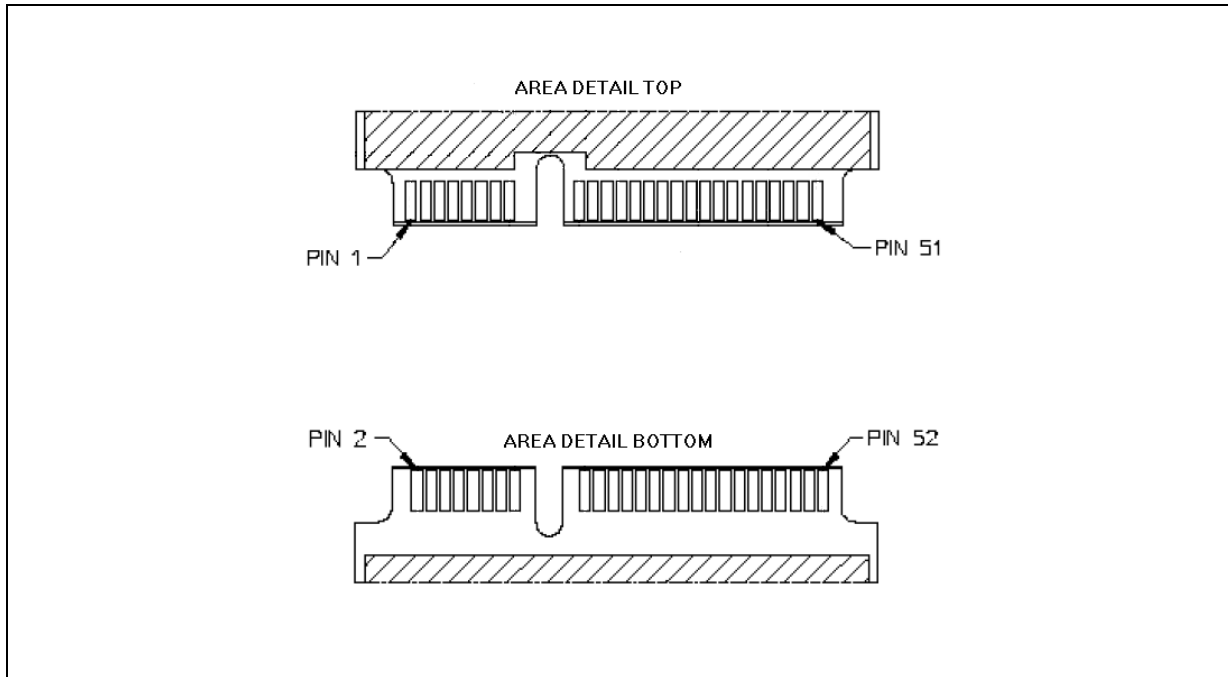
5.2 Signal Descriptions

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]	+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]	+1.5 V	1.5 V Source
P29	GND	Return Current Path
P30[2]	Two Wire Interface	Two Wire Interface Clock
P31	-A	Host Transmitter Differential Signal Pair This is an input of the SSD.
P32[2]	Two Wire Interface	Two Wire Interface Data
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	Device Type	No Connect
P44	Reserved	No Connect
P45[3]	Vendor	Vendor Specific / Manufacturing Pin
P46	Reserved	No Connect
P47[3]	Vendor	Vendor Specific / Manufacturing Pin
P48[1]	+1.5 V	1.5 V Source
P49	DA/DSS	Device Activity Signal / Disable Staggered Spin-up
P50	GND	Return Current Path
P51[4]	Presence Detection	Shall be pulled to GND by device
P52	+3.3 V	3.3 V Source

Notes:

1.   1.5 V rail is not used on the Intel SSD 310 Series. No connect on the host side.
2.   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. Not used on the Intel SSD 310 Series. No connect on the host side.
3.   Vendor-specific pins are not used in the Intel SSD 310 Series. No connect on the host side.
4.   Presence detection pin indicates presence of an mSATA device.

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 20 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
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 (1×10^6 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
February 2011	007	Updated notes in Table 7. Updated Section 3.5, "Product Regulatory Compliance" on page 9.
January 2011	006	Changed documentation status from Preliminary to Production.
December 2010	005	Added Note 1 in Table 7.
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	FC1000FBh	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.