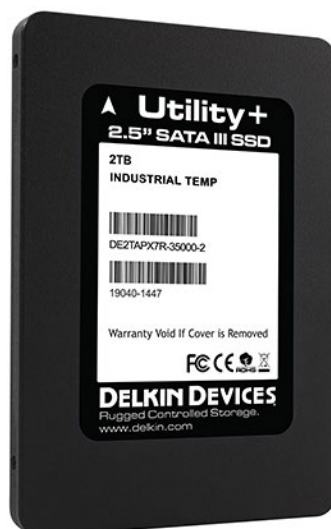# DELKIN DEVICES®

Utility +

SATA III Industrial 2.5"

Solid State Drive

Engineering Specification

Document Number: 401-0574-00

Revision: A

Product Overview

- **Capacity**
  - 128GB up to 2TB
- **SATA Interface**
  - SATA Revision 3.1
  - SATA Gen3/Gen2/ Gen1 interface
- **Flash Interface**
  - Flash type: 3D TLC
- **Performance**
  - Read: up to 550 MB/s
  - Write: up to 510 MB/s
- **Power Consumption**[Note1]
  - Write: ≤1,750mW
  - Idle: ≤ 215mW
- **TBW (Terabytes Written)** [Note2]
  - 2TB ≥ 2,900 TB

- **MTBF**
  - More than 3,000,000 hours
- **Features**
  - Advanced Wear Leveling
  - Bad Block Management
  - TRIM
  - SMART
  - Over-Provisioning
- **Low Power Management**
  - DEVSLP Mode (Optional)
- **Temperature Range**
  - Operation: -40°C ~ 85°C
  - Storage: -40°C ~ 85°C
- **RoHS compliant**

Notes:

1. Please see "4.2 Power Consumption" for details.

2. Please see "TBW (Terabytes Written)" in Chapter 2" for details.

3. Supported by a separate firmware version.

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1. INTRODUCTION

1.1. General Description

Delkin's Utility+ Industrial 3D TLC 2.5" Solid State Drive (SSD) delivers all the advantages of flash disk technology with the performance of the Serial ATA III interface and is fully compliant with the standard 2.5" form factor.   Delkin's SSD draws significantly less power compared to traditional hard drives and is also hot swappable. The drive is available in capacities from 128GB to 2TB and can reach speeds up to 550MB/s read as well as 510MB/s write (measured by CrystalDiskMark v5.0).

1.2. Product Block Diagram

Top Side   Bottom Side
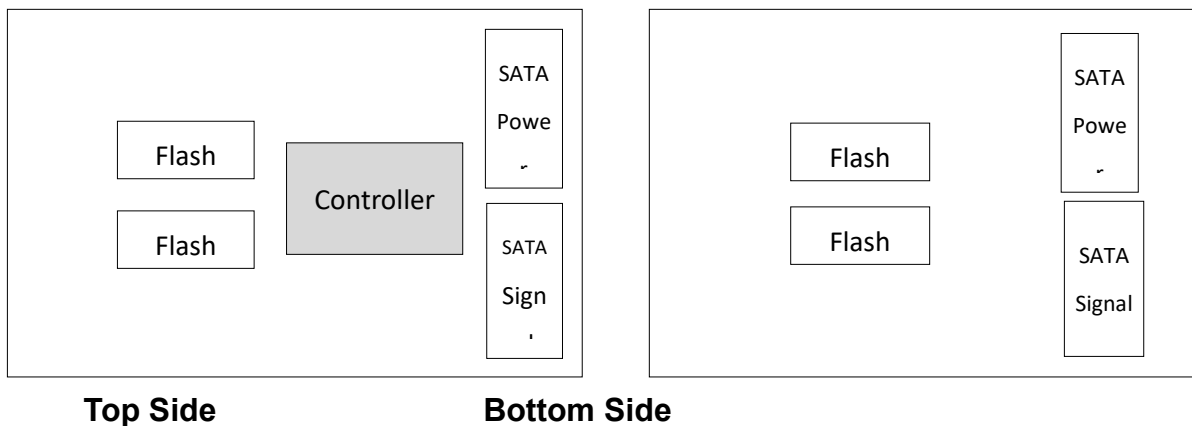
Figure 1-1 SSD Product Block Diagram

1.3. Flash Management

1.3.1. Error Correction Code (ECC)

Flash memory cells will deteriorate with use, which might generate random bit errors in the stored data. Thus, Delkin's 2.5" SSD applies the Low Density Parity Check (LDPC) ECC algorithm, which can detect and correct errors occur during read process, ensure data been read correctly, as well as protect data from corruption.

1.3.2. Wear Leveling

NAND flash devices can only undergo a limited number of program/erase cycles, and in most cases, the flash media are not used evenly. If some areas are updated more frequently than others, the lifetime of the device would be reduced significantly. Thus, Wear Leveling is applied to extend

the lifespan of NAND flash by evenly distributing write and erase cycles across the media.

Delkin utilizes advanced Wear Leveling algorithms, which can efficiently distribute flash usage through the whole flash media area. Moreover, by implementing both dynamic and static Wear Leveling algorithms, the life expectancy of the NAND flash is greatly improved.

1.3.3. Bad Block Management

Bad blocks are blocks that include one or more invalid bits, and their reliability is not guaranteed. Blocks that are identified and marked as bad by the manufacturer are referred to as "Initial Bad Blocks". Bad blocks that are developed during usage of the flash are named "Later Bad Blocks". Delkin implements an efficient bad block management algorithm to detect the factory-produced bad blocks and manages any bad blocks that appear with use. This practice further prevents data being stored into bad blocks and improves data reliability.

1.3.4. TRIM

TRIM is a feature which helps improve the read/write performance and speed of solid-state drives (SSD). Unlike hard disk drives (HDD), SSDs are not able to overwrite existing data, so the available space gradually becomes smaller with each use. With the TRIM command, the operating system can inform the SSD which blocks of data are no longer in use and can be removed permanently. Thus, the SSD will perform an erase action, which prevents unused data from occupying blocks.

1.3.5. SMART

SMART, an acronym for Self-Monitoring, Analysis and Reporting Technology, is an open standard that allows a drive to automatically detect its health and report potential failures. When a failure is recorded by SMART, users can choose to replace the drive to prevent unexpected outage or data loss. Moreover, SMART can inform users of impending failures while there is still time to perform proactive actions, such as copy data to another device.

1.3.6. Over-Provisioning

Over Provisioning refers to the inclusion of extra NAND capacity in a SSD, which is not visible or usable by users. With Over Provisioning, the performance and IOPS (Input/Output Operations per Second) are improved by providing the controller additional space to manage P/E cycles, which enhances the reliability and endurance as well. Moreover, the write amplification of the SSD becomes lower when the controller writes data to the flash.

1.4. Thermal Throttling

The purpose of thermal throttling is to prevent any components in a SSD from over heating during read and write operations. The firmware can apply different levels of throttling to achieve the purpose of protection efficiently and proactively via S M A R T reading.

1.5. Low Power Management

1.5.1. DEVSLP Mode (Optional)

With the increasing need of aggressive power/battery life, SATA interfaces include a new feature, Device Sleep (DEVSLP) mode, which helps further reduce the power consumption of the device. DEVSLP enables the device to completely power down the device PHY and other sub-systems, making the device reach a new level of lower power operation. The DEVSLP does not specify the exact power level a device can achieve in the DEVSLP mode, but the power usage can be dropped down to 5mW or less.

1.5.2. DIPM/HIPM Mode

SATA interfaces contain two low power management states for power saving: Partial and Slumber modes. In Partial mode, the device must resume full operation within 10 microseconds, whereas in Slumber mode, the device has 10 milliseconds to become fully operational. SATA interfaces allow low power modes to be initiated by Host (HIPM, Host Initiated Power Management) or Device (DIPM, Device Initiated Power Management). As for HIPM, Partial or Slumber mode can be invoked directly by the software. For DIPM, the device will send requests to enter Partial or Slumber mode.

1.6. Advanced Device Security Features

1.6.1. Secure Erase

Secure Erase is a standard ATA command and will write "0xFF" to all cells, to fully wipe all the data on hard drives and SSDs. When this command is issued, the SSD controller will erase its storage blocks and return to its factory default settings.

1.6.2. Write Protect

When a SSD contains too many bad blocks and data is continuously written in, then the SSD may no longer be usable. Thus, Write Protect is a mechanism to prevent data from being written in and protect the accuracy of data that are already stored in the SSD.

1.7. SSD Lifetime Management

1.7.1. Terabytes Written (TBW)

TBW (Terabytes Written) is a measurement of SSDs' expected lifespan, which represents the amount of data written to the device. To calculate the TBW of a SSD, the following equation is applied:

TBW = [(NAND Endurance) x (SSD Capacity) x (WLE)] / WAF

NAND Endurance: NAND endurance refers to the P/E (Program/Erase) cycle rating of NAND flash, per the manufacturer's specification.

SSD Capacity: The SSD capacity is the specific capacity in total of a SSD.

WLE: Wear Leveling Efficiency (WLE) represents the ratio of the average amount of erases on all the blocks to the erases on any block at maximum.

WAF: Write Amplification Factor (WAF) is a numerical value representing the ratio between the amount of data that a SSD controller writes to the flash and the amount of data that the host's flash controller writes. A better WAF, which is near 1, guarantees better endurance and lower frequency of data written to flash memory.

1.8. An Adaptive Approach to Performance Tuning

1.8.1. Throughput

Based on the available space of the disk, Delkin SSD controller will regulate the read/write speed and manage the throughput performance. When significant free space remains, the firmware will continuously perform read/write activity. At this stage, there is still no need to implement garbage collection to allocate and release memory, which will accelerate read/write processing to improve the performance. However, when free space is used up, the controller will slow down the read/write processing, and implement garbage collection to release memory blocks. Hence, read/write performance will become slower.

1.8.2. Predict & Fetch

Normally, when the host tries to read data from the SSD, the SSD will only perform one read action after receiving one command. However, Delkin's controller applies ***Predict & Fetch*** to improve the read speed. When the host issues sequential read commands to the SSD, the SSD will automatically expect that the following will also be read commands. Thus, before receiving the next

command, flash has already prepared the data. Accordingly, this accelerates the data processing time, and the host does not need to wait as long to receive data.

2. PRODUCT SPECIFICATIONS

- **Capacity**
  - From 128GB up to 2TB

- **Electrical/Physical Interface**
  - SATA Interface
    - ◆ Compatible with SATA Gen3 / Gen2 / Gen1 interface
    - ◆ AC coupling for transmitter and receiver
    - ◆ Self-calibrated and embedded termination resistor at transmitter
    - ◆ Supports power management
    - ◆ Supports expanded register for SATA protocol 48 bit addressing mode

- **ECC Scheme**
  - SATA SSD applies the LDPC (Low Density Parity Check) of ECC algorithm

- **Operating Voltage Supply**
  - 5V ± 5%

- **Power Saving Implementation**
  - Idle Mode
  - Partial Mode
  - Slumber Mode

- **LBA Range**
  - IDEMA standard

- **UART/GPIO function**

- **Supports SMART and TRIM commands**

- **Certification & Compliance**
  - RoHS
  - WHQL

● Performance and Power Consumption

Capacity	Sequential Performance		Power Consumption	
	CrystalDiskMark		Read (mW)	Write (mW)
	Read (MB/s)	Write (MB/s)		
128GB	550	450	1150	1150
256GB	550	485	1200	1300
512GB	550	500	1200	1550
1TB	550	510	1350	1730
2TB	550	510	1450	1750

NOTE: For more details on Power Consumption, please refer to Chapter 4.2.

● Endurance - TBW (Terabytes Written) DWPD (Drive Writes Per Day)

Capacity	TBW	DWPD
128GB	90	0.64
256GB	220	0.78
512TB	540	0.96
1TB	1200	1.07
2TB	3000	1.29

NOTES:

- Many factors affect drive endurance / TBW, including flash configuration, SDR configuration, host platform, usage model, write amplification factor, etc.
- The figures above are estimates and are not guarantees.
- The test followed JEDEC219A client endurance workload.
- DWPD is calculated based on 3-year lifetime.
- DWPD (Drive Write Per Day) = TBW/ (365 x years x User Capacity(TB))

● POR/SPOR Ready Time

	POR Ready Time				SPO Ready Time			
	Power On		Identity		Power On		Identity	
	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.
128GB	300	500	350	550	8000	9000	8100	9100
256GB								
512TB								
1TB								
2TB								

Unit ms

Notes:

1. POR/SPOR stands for following:

   (a) POR (Power On Ready) : The ready time variation depends on data recover size.

   (b) SPOR (Power On Ready after Sudden Power Off): The ready time variation depends on data recover size.

2. Power On/Identify ready time stands for following:

   (a) Power on Time : From Power On to SSD response after drive ready.

   (b) Identify Time : Power on Time + host issue Identify Command, response Ack.

3. Measurement environment: Room temperature: 20~25℃, humidity: 40~60%RH.

● Part Numbers

Industrial 3D TLC 2.5" SSD (-40 to 85°C Operating Temperature)

Capacity	Standard Part Number
128GB	DE1HFTUM5-35000-2
256GB	DE2HFTVM5-35000-2
512GB	DE5HFTVM5-35000-2
1TB	DE1TFTVM5-35000-2
2TB	DE2TFTWM5-35000-2

3. ENVIRONMENTAL SPECIFICATIONS

3.1. Environmental Conditions

3.1.1. Temperature and Humidity
- Temperature:
  - ◆ Storage: -40°C to 85°C
  - ◆ Operational: -40°C to 85°C

- Humidity:
  - ◆ RH 90% under 55°C (operational)

3.1.2. Shock & Vibration
- Shock Specification
  - ◆ 1500G, 0.5ms duration

- Vibration Specification
  - ◆ 20Hz ~80Hz/1.52mm displacement, 80Hz~2000Hz / 20G Acceleration

3.1.3. Electrostatic Discharge (ESD)
- +/- 4KV

3.1.4. EMI Compliance

- FCC: ANSI C63.4
- CE: EN55032, CISPR32
- BSMI: CNS 13438
- VCCI: VCCI-CISPR32

3.2. MTBF

MTBF, an acronym for Mean Time Between Failures, is a measure of a device's reliability. Its value represents the average time between a repair and the next failure. The measure is typically in units of hours. The higher the MTBF value, the higher the reliability of the device. The predicted result of Delkin's 2.5" SSD is more than 3,000,000 hours. Our MTBF result is based on simulation software (Relex7.3).

3.3. Certification & Compliance

- RoHS
- WHQL

4. ELECTRICAL SPECIFICATIONS

4.1. Supply Voltage

Table 4-1 Supply Voltage

Parameter	Rating
Operating Voltage	5V ± 5% (4.75V ~ 5.25V)
Rise Time (Max/min)	100ms / 0.1ms
Fall Time (Max/min)	5s / 1ms
Min. Off Time	1s

NOTES:

1. The min. off time is the time between power removed from SSD (Vcc < 100mV) and power re-applied.

2. Ensure the voltage of each power domain in SSD has enough time to discharge (< 0.1V).

3. Rise time from 10% to 90% of 5V.

4. Fall time from 90% to 10% of 5V.

4.2. Power Consumption

Table 4-2 Power Consumption

Capacity	Read	Write	Partial	Slumber	Idle
128GB	1150	1150	55	18	210
256GB	1200	1300	55	20	210
512GB	1200	1550	55	20	210
1TB	1350	1730	60	20	215
2TB	1450	1750	60	20	215

Unit: mW

NOTES:

1. The average value of power consumption is achieved based on 100% conversion efficiency.

2. Sequential R/W is measured while testing 4000MB sequential R/W 5 times by CrystalDiskMark.

3. Power Consumption may differ according to flash configuration, SDR configuration, and host platform.

4. Measurement environment: Room temperature: 20~25℃, humidity: 40~60%RH.

5. INTERFACE

5.1. Pin Assignment and Descriptions
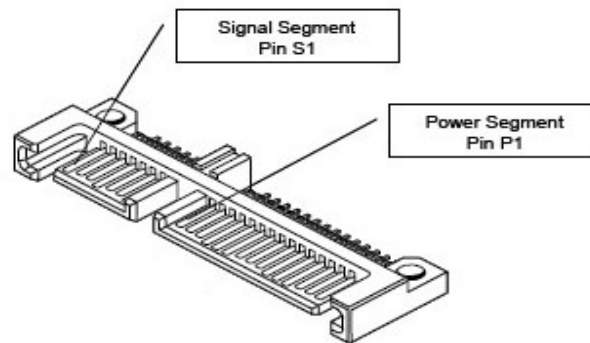
Table 5-1 Signal Segment Pin Assignment and Descriptions

PIN NUMBER	FUNCTION
S1	GND
S2	A+ (DIFFERENTIAL SIGNAL PAIR A)
S3	A- (DIFFERENTIAL SIGNAL PAIR A)
S4	GND
S5	B- (DIFFERENTIAL SIGNAL PAIR B)
S6	B+ (DIFFERENTIAL SIGNAL PAIR B)
S7	GND

Table 5-2 Power Segment Pin Assignment and Descriptions

PIN NUMBER	FUNCTION
P1	NOT USED (3.3V)
P2	NOT USED (3.3V)
P3	DEVSLP
P4	GND
P5	GND
P6	GND
P7	5V PRE-CHARGE
P8	5V
P9	5V
P10	GND
P11	RESERVED
P12	GND
P13	NOT USED (12V PRE-CHARGE)
P14	NOT USED (12V)
P15	NOT USED (12V)

6. SUPPORTED COMMANDS

6.1. ATA Command List

Table 6-1 ATA Command List

Op Code			Description	Op Code			Description
00h			NOP	C9h			Read DMA without Retry
06h			Data Set Management	CAh			Write DMA
10h-1Fh			Recalibrate	CBh			Write DMA without Retry
20h			Read Sectors	CEh			Write Multiple FUA EXT
21h			Read Sectors without Retry	E0h			Standby Immediate
24h			Read Sectors EXT	E1h			Idle Immediate
25h			Read DMA EXT	E2h			Standby
27h			Read Native Max Address EXT	E3h			Idle
29h			Read Multiple EXT	E4h			Read Buffer
2Fh			Read Log EXT	E5h			Check Power Mode
30h			Write Sectors	E6h			Sleep
31h			Write Sectors without Retry	E7h			Flush Cache
34h			Write Sectors EXT	E8h			Write Buffer
35h			Write DMA EXT	E9h			READ BUFFER DMA
37h			Set Native Max Address EXT	EAh			Flush Cache EXT
39h			Write Multiple EXT	EBh			Write Buffer DMA
3Dh			Write DMA FUA EXT	ECh			Identity Device
3Fh			Write Long EXT	EFh			Set Features
40h			Read Verify Sectors	EFh	02h		Enable volatile write cache
41h			Read Verify Sectors without Retry	EFh	03h		Set Transfer mode
42h			Read Verify Sectors EXT	EFh	05h		Enable the APM feature set
44h			Zero EXT	EFh	10h		Enable use of SATA features set
45h			WRITE UNCORRECTABLE EXT	EFh	10h	02h	Enable DMA Setup FIS Auto-Activate optimization
47h			Red Log DMA EXT	EFh	10h	03h	Enable Device-initiated interface power state (DIPM) transitions
57h			Write Log DMA EXT	EFh	10h	06h	Enable Software Settings Preservation (SSP)
60h			Read FPDMA Queued	EFh	10h	07h	Enable Device Automatic Partial to Slumber transitions
61h			Write FPDMA Queued	EFh	10h	09h	Enable Device Sleep
70h-76h			Seek	EFh	55h		Disable read look-ahead
79h-7Fh			Seek	EFh	66h		Disable reverting to power-on defaults
90h			Execute Device Diagnostic	EFh	82h		Disable volatile write cache
91h			Initialize Device Parameters	EFh	85h		Disable the APM feature set
92h			Download Microcode	EFh	90h		Disable use of SATA feature set
93h			DOWNLOAD MICROCODE DMA	EFh	90h	02h	Disable DMA Setup FIS Auto-Activate optimization
B0h			SMART	EFh	90h	03h	Disable Device-initiated interface power state (DIPM) transitions
B0h	D0h		SMART READ DATA	EFh	90h	06h	Disable Software Settings Preservation (SSP)
B0h	D2h	Ooh	SMART READ ATTRIBUTE THRESHOLDS	EFh	90h	07h	Disable Device Automatic Partial to Slumber transitions
B0h	D2h	F1h	SMART ENABLE/DISABILE ATTRIBUTE AUTOSAVE	EFh	90h	09h	Disable Device Sleep
B0h	D4h		SMART EXECUTE OFF-LINE IMMEDIATE	EFh	AAh		Enable read look-ahead

			EFh	CCh	Enable reverting to power-on defaults
B0h	D5h	SMART READ LOG		F1h	Security Set Password
B0h	D6h	SMART WRITE LOG		F2h	Security Unlock
B0h	D8h	SMART ENABLE OPERATIONS		F3h	Security Erase Prepare
B0h	D9h	SMART DISABLE OPERATIONS		F4h	Security Erase Unit
B0h	DAh	SMART RETURN STATUS		F5h	Security Freeze Lock
				F6h	Security Disable Password
B1h	C0h	Device Configuration Restore		F8h	Read Native Max Address
B1h	C2h	DEVICE CONFIGURATION IDENTIFY		F9h	Set Max Address
B1h	C3h	DEVICE CONFIGURATION SET			
B1h	C4h	DEVICE CONFIGURATION IDENTITY DMA			
B1h	C5h	DEVICE CONFIGURATION SET DMA			
F9h	01h	SET MAX SET PASSWORD			
F9h	02h	SET MAXLOCK			
F9h	03h	SET MAX UNLOCK			
F9h	04h	SET MAX FREEZE LOCIK			
	C4h	Read Multiple			
	C5h	Write Multiple			
	C6h	Set Multiple Mode			
	C8h	Read DMA			

6.2. Identify Device Data

The following table details the sector data returned by the IDENTIFY DEVICE command.

Table 6-2 List of Device Identification

Word	F: Fixed V: Variable X: Both	Default Value	Description
0	F	0040h	General configuration bit-significant information
1	X	*1	Obsolete
2	F	C837h	Specific configuration
3	X	*2	Obsolete
4-5	X	0000h	Retired
6	X	*3	Obsolete
7-8	X	0000h	Reserved for assignment by the Compact Flash Association
9	X	0000h	Retired
10-19	V	Varies	Serial number (ATA string)
20-21	X	0000h	Retired
22	X	*4	Obsolete
23-26	V	Varies	Firmware revision (ATA string)
27-46	V	Varies	Model number (ATA string)
47	X	*5	Obsolete
48	F	4000h	Trusted Computing feature set options
49	F	2F00h	Capabilities
50	F	4000h	Capabilities

| 51-52	X	*6	Obsolete
53	F	0007h	Word 88 and 70:64 are valid
54-58	X	*7	Obsolete
59	F	DD10h	Number of sectors transferred per interrupt on MULTIPLE commands
60-61	V	Varies	Maximum number of sector (28bit LBA mode)
62	X	*8	Obsolete
63	F	0407h	Multiword DMA modes supported/selected
64	F	0003h	PIO mode 3 and mode 4 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	9F00h	Additional Supported (support download microcode DMA)
70	X	0000h	Reserved
71-74	X	0000h	Reserved for the IDENTIFY PACKET DEVICE command
75	F	001Fh	Queue depth
76	F	C50Eh	Serial SATA capabilities
77	F	0006h	Serial ATA Additional Capabilities
78	F	004Ch	Serial ATA features supported
79	F	0040h	Serial ATA features enabled
80	F	0FF8h	Major Version Number
81	F	0000h	Minor Version Number
82	F	746Bh	Commands and feature sets supported
83	F	7D09h	Commands and feature sets supported
84	F	4163h	Commands and feature sets supported
85	F	7469h	Commands and feature sets supported or enabled
86	F	BC01h	Commands and feature sets supported or enabled
87	F	4163h	Commands and feature sets supported or enabled
88	F	007Fh	Ultra DMA Modes
89	F	000Ah	Time required for Security Erase Unit command
90	F	001Eh	Time required for Security Erase Unit command
91	F	0000h	Current APM level value
92	F	FFFEh	Master Password Identifier
93	F	0000h	Hardware reset result. For SATA devices, word 93 shall be set to the value 0000h.
94	X	*9	Obsolete
95	F	0000h	Stream Minimum Request Size
96	F	0000h	Streaming Transfer Time – DMA
97	F	0000h	Streaming Access Latency – DMA and PIO
98-99	F	0000h	Streaming Performance Granularity
100-103	V	Varies	Number of User Addressable Logical Sectors
104	F	0000h	Streaming Transfer Time – PIO
105	F	0004h	Maximum number of 512-byte blocks per DATA SET MANAGEMENT command

106	F	4000h	Physical sector size/Logical sector size
107	F	0000h	Inter-seek delay for ISO-7779 acoustic testing
108-111	V	Varies	World Wide Name
112-115	X	0000h	Reserved
116	X	***10**	Obsolete
117-118	F	0000h	Logical sector size
119	F	4018h	Commands and feature sets supported
120	F	4018h	Commands and feature sets supported or enabled
121-126	X	0000h	Reserved for expanded supported and enabled settings
127	X	***11**	Obsolete
128	F	0021h	Security status
129-159	V	Varies	Vendor specific
160-167	X	0000h	Reserved for CFA
168	V	Varies	Device Nominal Form Factor
169	F	0001h	DATA SET MANAGEMENT command support
170-173	F	0000h	Additional Product Identifier
174-175	X	0000h	Reserved
176-205	F	0000h	Current media serial number
206	F	0000h	SCT Command Transport
207-208	X	0000h	Reserved
209	F	4000h	Alignment of logical sectors within a physical sector
210-211	F	0000h	Write-Read-Verify Sector Mode 3 Count (not support)
212-213	F	0000h	Write-Read-Verify Sector Mode 2 Count (not support)
214-216	X	***12**	Obsolete
217	F	0001h	Nominal media rotation rate
218	X	0000h	Reserved
219	X	***13**	Obsolete
220	V	0000h	Write-Read-Verify feature set current mode
221	X	0000h	Reserved
222	F	107Fh	Transport major version number
223	F	0000h	Transport minor version number
224-229	X	0000h	Reserved
230-233	F	0000h	Extend number of user addressable sectors
234	F	0001h	Minimum number of 512-byte data blocks per Download Microcode operation
235	F	FFFEh	Minimum number of 512-byte data blocks per Download Microcode operation
236-254	X	0000h	Reserved
255	F	Varies	Integrity word (Checksum and Signature) Bit[15:8] Checksum
234	F	0001h	Minimum number of 512-byte data blocks per DOWNLOAD MICROCODE command for mode 03h
235	F	FFFeh	Maximum number of 512-byte data blocks per DOWNLOAD MICROCODE command for mode 03h
236-254	F	0h	Reserved
255	X	XXA5h XX is variable	Integrity word (Checksum and Signature)

6.3. S.M.A.R.T. Attributes

Entry	ID	Description
0	0x01	Number of Uncorrectable Errors Accumulated.
1	0x09	Power on Hours Count
2	0x0C	Power Cycle Count (number of power on/off cycles accumulated)
3	0xA8	SATA PHY Error Count (Only record from power on, when power off this value will clear to zero. These values include all PHY error count, ex data FIS CRC, code error, disparity error, command FIS CRC…..)
4	0xAA	Bad Block Count (early bad count and later bad count)
5	0xAD	Erase Count (max. erase count and average erase count)
6	0xC0	Unexpected Power Loss Count
7	0xC2	Temperature
8	0xDA	Number of Accumulation CRC Error (read/write data FIS CRC error)
9	0xE7	SSD Life Remaining
10	0xF1	Host Write (GB)

7. PHYSICAL DIMENSIONS

Dimension: 100.00mm (L) x 69.85mm (W) x 7mm (H)
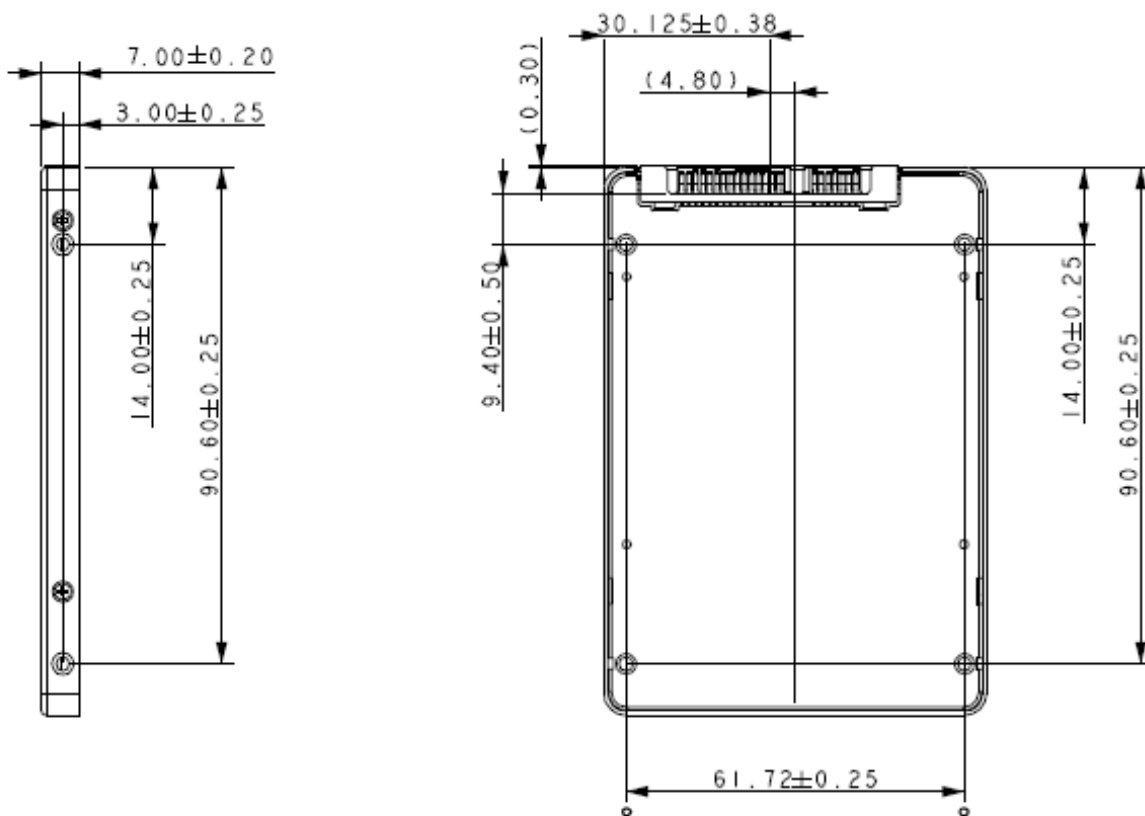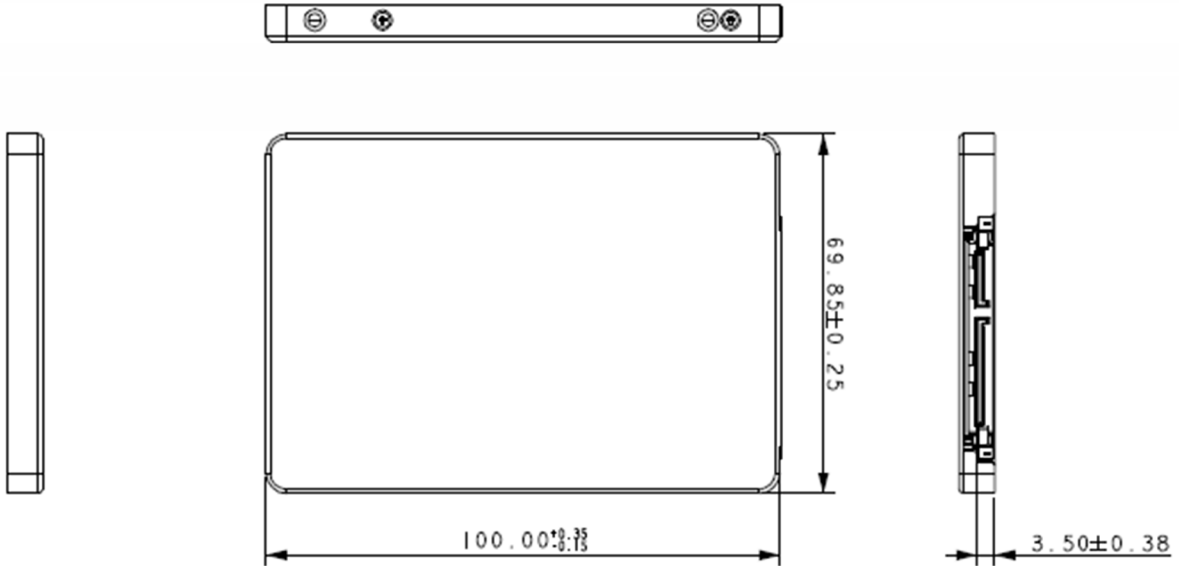
- ● WARNING: This product may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to www.p65warnings.ca.gov.