Check NVMe Health
WDC WDS250G2B0C-00PXH0

Check NVMe is a short Test Suite that verifies drive health and wear by running the drive diagnostic, reviewing SMART data and Self-Test history.

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EPIC NVMe Utilities
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SUMMARY

Check NVMe is a short Test Suite that verifies drive health and wear by running the drive diagnostic, reviewing SMART data and Self-Test history. The NVMe tested was the WDC WDS250G2B0C-00PXH0 with firmware 211070WD. The device was installed in a HP system, model HP Z1 Entry Tower G5 running Microsoft Windows 11 Pro.

STARTED	ENDED	DURATION
Jan 01, 2023 - 10:13:22.806	Jan 01, 2023 - 10:15:14.264	0:01:51.458

TESTS	3	
PASS	1	33.3%
FAIL	2	66.7%
SKIP	0	0.0%

A total of 3 tests completed 27 verifications for 18 unique requirements.

REQUIREMENTS	18	
PASS	15	83.3%
FAIL	3	16.7%

VERIFICATIONS	27	
PASS	21	77.8%
FAIL	6	22.2%

This health check identified three possible issues with the drive.

[1] SMART attributes indicate the drive has been operated above the critical temperature which may have caused damage to the drive.

[2] SMART attributes indicate the data written to the drive has exceeded 90% of TBW. This indicates the drive is getting close to the end of the warranty period.

[3] Testing of the Admin Commands found the Get Feature 5 command always fails with IO code 1117.

Test Summary

TEST	RESULT
Suite start info	**FAIL**

RQMT: Admin commands shall pass	**FAIL**
RQMT: Time operating at or above the critical temperature shall be 0	**FAIL**
RQMT: Data Used shall be less than 90% of TBW	**FAIL**

Short diagnostic	**PASS**
Suite end info	**FAIL**

RQMT: Admin commands shall pass	**FAIL**
RQMT: Time operating at or above the critical temperature shall be 0	**FAIL**
RQMT: Data Used shall be less than 90% of TBW	**FAIL**

Requirement Verification Summary

A requirement can be verified multiple times within a test suite. The table below lists the results for each attempt to verify a requirement.

REQUIREMENT	PASS	FAIL
Admin commands shall pass	**0**	**2**
Critical warnings shall be 0	2	0
Data Used shall be less than 90% of TBW	**0**	**2**
Error count shall not increase	1	0
Media and integrity errors shall be 0	2	0
Percent throttled shall be less than 1%	2	0
Percentage Used shall be less than 90%	2	0
Power On Hour change shall be within 1 hour of host time change	1	0
Power On Hours Used shall be less than 90% of Warranty Hours	2	0
Prior self-test failures shall be 0	2	0
SMART counters, such as Data Written, shall not decrement	1	0
Self-test Power-On Hours match hours reported in log page 2	1	0
Self-test progress is monotonic	1	0
Self-test progress is roughly linear (Coeff greater than 0.9)	1	0
Self-test result shall be 0 indicating no errors	1	0
Self-test run time shall be less than or equal to 2 minutes	1	0
Static parameters, such as Model Number, shall not change	1	0
Time operating at or above the critical temperature shall be 0	**0**	**2**

NVME INFORMATION

VENDOR	MODEL	SIZE	VERSION
Sandisk	WDC WDS250G2B0C-00PXH0	250 GB	1.4.0

PARAMETER	VALUE
Serial Number	2035A0805352
Number Of Namespaces	1
Namespace 1 EUI64	001b44-8b49bc0ecb
Namespace 1 NGUID	e8238fa6bf530001-001b44-8b49bc0ecb
Namespace 1 Size	250 GB
Namespace 1 LBA Size	512
Firmware	211070WD
Firmware Slots	2
Firmware Activation Without Reset	Supported
Host Memory Buffer	Enabled. Size = 16,384 pages
Autonomous Power State Transition	Supported and Disabled
Volatile Write Cache	Enabled
Host Throttle Threshold TMT1	Disabled
Host Throttle Threshold TMT2	Disabled
Drive Throttle Threshold WCTEMP	80 C
Drive Throttle Threshold CCTEMP	85 C

Power States

STATE	NOP	MAX POWER	ENTRY LATENCY	EXIT LATENCY
0	False	3.5 Watts	Not Reported	Not Reported
1	False	2.4 Watts	Not Reported	Not Reported
2	False	1.9 Watts	Not Reported	Not Reported
3	True	0.02 Watts	3,900 uS (0.003 sec)	11,000 uS (0.011 sec)
4	True	0.005 Watts	5,000 uS (0.005 sec)	39,000 uS (0.039 sec)

PCIe

PCI	VENDOR	VID	DID	WIDTH	SPEED	ADDRESS
Endpoint	Sandisk	0x15B7	0x5009	x4	Gen3 8.0GT/s	Bus 1, device 0, function 0
Root		0x8086	0xA340			Bus 0, device 27, function 0

SMART Attributes

PARAMETER	START	END	DELTA
Available Spare	100 %	100 %	
Available Spare Threshold	10 %	10 %	
Controller Busy Time	19,015 Min	19,015 Min	
Critical Composite Temperature Time	2 Min	2 Min	
Data Read	416,309.647 GB	416,309.647 GB	
Data Units Read	813,104,780	813,104,780	
Data Units Written	272,675,205	272,675,205	
Data Written	139,609.705 GB	139,609.705 GB	
Host Read Commands	10,760,324,373	10,760,324,373	
Host Write Commands	5,997,051,692	5,997,051,692	
Media and Data Integrity Errors	0	0	
Number of Error Information Log Entries	1	1	
Percentage Used	19 %	19 %	
Power Cycles	199	199	
Power On Hours	2,128	2,128	
Thermal Management Temperature 1 Count	0	0	
Thermal Management Temperature 1 Time	0 Sec	0 Sec	
Thermal Management Temperature 2 Count	0	0	
Thermal Management Temperature 2 Time	0 Sec	0 Sec	
Unsafe Shutdowns	27	27	
Warning Composite Temperature Time	64 Min	64 Min	
Seconds Throttled	3960 Sec	3960 Sec	
Percent Throttled	0.1 %	0.1 %	
Host Time Seconds	1672596803.487	1672596914.158	110.0

SYSTEM INFORMATION

PARAMETER	VALUE
Supplier	HP
Model	HP Z1 Entry Tower G5
BIOS	R01 Ver. 02.15.00
Hostname	DESKTOP-AJDMMEA
OS	Microsoft Windows 11 Pro

TEST 1: SUITE START INFO

FAIL

VERIFICATIONS	9	
PASS	**6**	**66.7%**
FAIL	**3**	**33.3%**

STARTED	ENDED	DURATION
Jan 01, 2023 - 10:13:23.072	Jan 01, 2023 - 10:13:23.557	0:00:00.485

DESCRIPTION

This test reads the NVMe drive information at the start of a test suite. If the drive is unhealthy or worn out the test suite is stopped. At the end of the suite, this start information is compared with the suite end information to verify no unexpected changes occurred during the testing.

This test defines worn out as Percentage Used, Percentage Data Written, or Percentage Warranty Used exceeding 90%. This provides a guard band so no wear percentage exceeds 100% during the test suite. The percentages are determined from the SMART attributes Percentage Used, Data Written, and Power On Hours and the drive specifications TBW and Warranty Years. If TBW and Warranty Years are not provided the Percentage Data Written and Percentage Warranty Used cannot be verified.

A drive is defined as unhealthy if 1) any prior self-test results failed or 2) has critical warnings or media and integrity errors or 3) has operated above the critical temperature or 4) has had an excessive amount of thermal throttling. The self-test results are read from Log Page 6 and the SMART attributes from Log Page 2.

The information is read using the nvmecmd utility [2]. This utility uses NVMe Admin Commands Identify Controller, Identify Namespace, Get Log Page, and Get Feature to get most of the information. A small amount of information is read from the Operating System, such as the driver verison and PCIe parameters.

For additional details see Read and compare NVMe information with nvmecmd [4].

RESULTS

The table below lists the NVMe Admin Commands completed. The nvmecmd utility only supports Namespace 1 and a subset of the log pages and features.

Admin Command	Time (ms)	Return Bytes	Return Code
Identify Controller	49.383	4096	0
Identify Namespace 1	0.550	4096	0
Get Log Page 0x01	0.174	16384	0
Get Log Page 0x02	1.633	512	0
Get Log Page 0x03	0.058	512	0
Get Log Page 0x05	0.021	4096	0
Get Log Page 0x06	0.113	564	0
Get Log Page 0x07	0.168	512	0
Get Log Page 0x07	29.613	33792	0
Get Log Page 0x08	0.168	512	0

Get Log Page 0x08	0.218	33792	0
Get Feature 1	0.053	0	0
Get Feature 2	0.047	0	0
Get Feature 4	0.047	0	0
Get Feature 4 (0x100000)	0.046	0	0
Get Feature 5	0.054	0	1
Get Feature 6	0.054	0	0
Get Feature 8	0.047	0	0
Get Feature 10	0.046	0	0
Get Feature 11	0.046	0	0
Get Feature 12	0.051	256	0
Get Feature 13	0.062	4096	0
Get Feature 14	0.050	8	0
Get Feature 16	0.054	0	0
Get Feature 17	0.056	0	0

Drive Health: Self-Test Results

The most recent 20 self-test results, short and extended, were read from Log Page 6. The drive is considered unhealthy if any prior results are failures.

PARAMETER	VALUE	NOTE
Prior self-test results	20	Logs up to 20
Prior self-test failures	0	

Drive Health: Errors and Warnings

The drive is considered unhealthy if the SMART attributes contain critical warnings or media and integrity errors.

PARAMETER	VALUE	NOTE
Critical Warnings	No	
Media and Integrity Errors	0	

Drive Health: Temperature Throttling

The drive is considered unhealthy if it has operated above the critical temperature or the percentage throttled is above 1%.

Percentage Throttled is defined as 100 * (Hours Throttled / Power On Hours) where Hours Throttled is the cumulative time of all throttle states.

PARAMETER	VALUE	NOTE
Percentage Throttled	0.1%	
Thermal Management Temperature 1 Time	0 sec	0.00 Hours
Thermal Management Temperature 2 Time	0 sec	0.00 Hours

Warning Composite Temperature Time	64 min	1.07 Hours
Critical Composite Temperature Time	2 min	0.03 Hours

Drive Wear

The Percentage Used SMART attribute is the primary reference for drive wear. If the drive Warranty and TBW are specified the Percentage Data Written and Percentage Warranty Used are calculated and verified.

Percentage Data Written is defined as 100 * (Data Written / TBW) where TBW (Terabytes Written) is the total amount of data that can be written to the drive during the warranty period. Data Written is the SMART attribute that reports the data written to the drive.

Percentage Warranty Used is defined as 100 * (Power On Hours / Warranty Hours) where warranty hours is the number of days in the warranty multiplied by 8 hours for client drives or 24 hours for enterprise drives.

PARAMETER	VALUE	NOTE
Percentage Used	19%	SMART attribute
Data Written	139,609.705 GB	SMART attribute
Power On Hours	2,128	SMART attribute
Terabytes Written (TBW)	150 TB	User Input
Percentage Data Written	93.1%	Calculated
Warranty Years	5 years	User input
Warranty Hours	14,600	Calculated
Percentage Warranty Used	14.6%	Calculated

VERIFICATIONS

This section lists the test steps and requirement verifications.

Step 1: Read info : FAIL

Read NVMe information using nvmecmd.

REQUIREMENT	VALUE	RESULT
Admin commands shall pass	Fail	FAIL

Step 2: Verify info : FAIL

Verify drive is healthy and not worn out.

REQUIREMENT	VALUE	RESULT
Critical warnings shall be 0	0	PASS
Media and integrity errors shall be 0	0	PASS
Time operating at or above the critical temperature shall be 0	2 min	FAIL
Percent throttled shall be less than 1%	0.1%	PASS
Percentage Used shall be less than 90%	19%	PASS
Data Used shall be less than 90% of TBW	93.1%	FAIL

Power On Hours Used shall be less than 90% of Warranty Hours	14.6%	**PASS**
Prior self-test failures shall be 0	0	**PASS**

TEST 2: SHORT DIAGNOSTIC

PASS		
VERIFICATIONS	5	
PASS	5	100.0%
FAIL	0	0.0%

STARTED	ENDED	DURATION
Jan 01, 2023 - 10:13:23.573	Jan 01, 2023 - 10:15:13.762	0:01:50.189

DESCRIPTION

The short Self-test is a diagnostic testing sequence that tests the integrity and functionality of the controller and may include testing of the media associated with namespaces. The run time is 2 minutes or less. The results are reported in Log Page 6 during and after the self-test.

RESULTS

The diagnostics passed and completed within the expected 2 minute run time. The progress reported was monotonic and roughly linear (having a Pearson product-moment correlation coefficient greater than 0.9).

PARAMETER	VALUE	NOTE
Run Time	1.834 Min	Must be less than 2 minutes
Monotonicity	Monotonic	Must be monotonic
Linearity	1.000	Must be greater than 0.9

This plot shows the progress reported in Log Page 6 during the diagnostic.
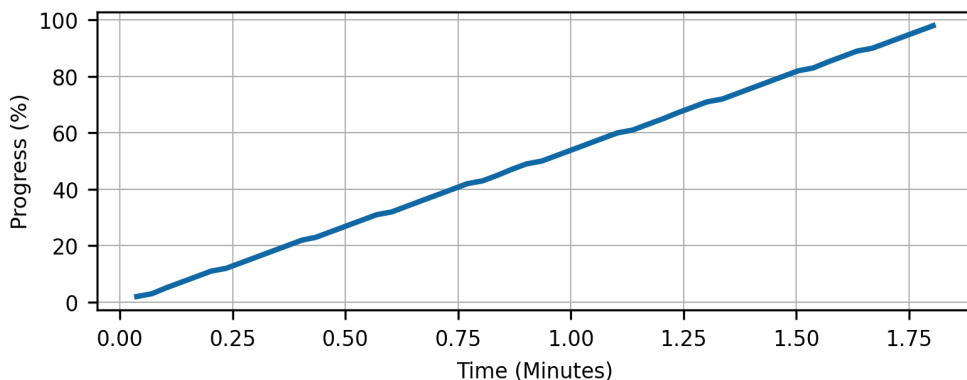
This plot shows the NVMe composite temperature during the diagnostic. The horizontal red lines are the throttle temperature limits for reference.
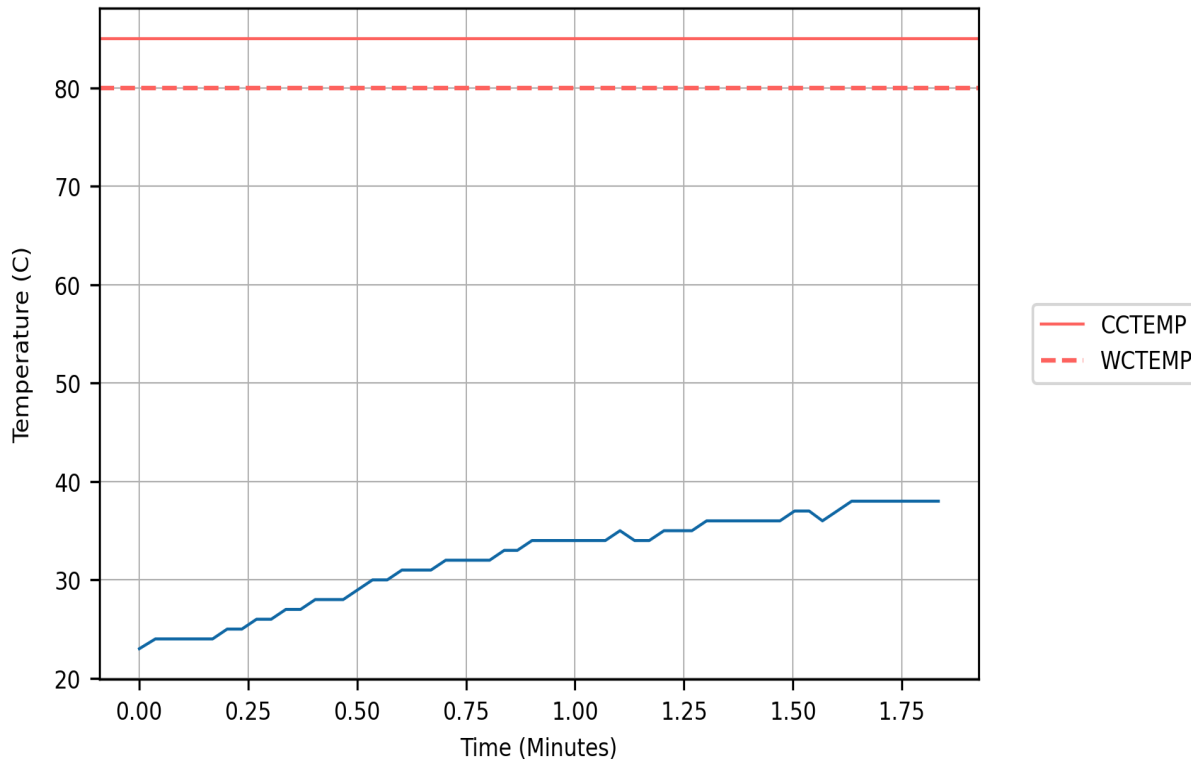
VERIFICATIONS

This section lists the test steps and requirement verifications.

Step 1: Diagnostic : PASS

REQUIREMENT	VALUE	RESULT
Self-test result shall be 0 indicating no errors	0	**PASS**
Self-test run time shall be less than or equal to 2 minutes	1.83 min	**PASS**
Self-test progress is monotonic	Monotonic	**PASS**
Self-test progress is roughly linear (Coeff greater than 0.9)	1.00	**PASS**
Self-test Power-On Hours match hours reported in log page 2	Match	**PASS**

TEST 3: SUITE END INFO

FAIL

VERIFICATIONS	13	
PASS	**10**	**76.9%**
FAIL	**3**	**23.1%**

STARTED	ENDED	DURATION
Jan 01, 2023 - 10:15:13.777	Jan 01, 2023 - 10:15:14.248	0:00:00.471

DESCRIPTION

This test reads the NVMe drive information at the end of the test suite and verifies the drive is healthy, not worn out, and no unexpected changes occurred during the test suite.

The test verifies the following unexpected changes do not occur. Static parameters, such as Model and Serial Number, must not change. SMART counters, such as Power-On Hours, must not decrement. Error parameters, such as media and data integrity errors, must not increase. The change in Power On Hours must match the host computer time change.

For additional details see Read and compare NVMe information with nvmecmd [4].

RESULTS

The host reported a time difference of 0:01:50.688 and the change in Power On Hours was 0 .

A total of 319 static parameters were verified not to change. A total of 23 counter parameters were verified not to decrement.

VERIFICATIONS

This section lists the test steps and requirement verifications.

Step 1: Read info : FAIL

Read NVMe information using nvmecmd.

REQUIREMENT	VALUE	RESULT
Admin commands shall pass	Fail	**FAIL**

Step 2: Verify info : FAIL

Verify drive is healthy and not worn out.

REQUIREMENT	VALUE	RESULT
Critical warnings shall be 0	0	**PASS**
Media and integrity errors shall be 0	0	**PASS**
Time operating at or above the critical temperature shall be 0	2 min	**FAIL**
Percent throttled shall be less than 1%	0.1%	**PASS**
Percentage Used shall be less than 90%	19%	**PASS**

Data Used shall be less than 90% of TBW	93.1%	**FAIL**
Power On Hours Used shall be less than 90% of Warranty Hours	14.6%	**PASS**
Prior self-test failures shall be 0	0	**PASS**

Step 3: Verify changes : PASS

Verify no unexpected changes from starting info.

REQUIREMENT	VALUE	RESULT
Static parameters, such as Model Number, shall not change	0	**PASS**
SMART counters, such as Data Written, shall not decrement	0	**PASS**
Power On Hour change shall be within 1 hour of host time change	0.03 hrs	**PASS**
Error count shall not increase	0	**PASS**

NVME PARAMETERS

TITLE	DESCRIPTION	VALUE
128-bit Host Identifier	Controller support for 128-bit Host Identifier, from CTRATT	Not Supported
ANA Group Identifier Maximum (ANAGRPMAX)	Maximum value of a valid ANA Group Identifier for any controller in the NVM subsystem	Not Supported
ANA Transition Time (ANATT)	Maximum seconds for transition between ANA states or that the controller reports the ANA change state	Not Supported
Abort Command Limit (ACL)	Maximum number of concurrently executing Abort commands supported by the controller	5
Admin Vendor Specific command handling	Admin Vendor Specific Commands use standard format or vendor specific format, from AVSCC	Not Vendor Specific
Aggregation Threshold (THR)	Feature 08h: Recommended minimum number of completion queue entries to aggregate per interrupt vector before signaling an interrupt to the host	1
Aggregation Time (TIME)	Feature 08h: Recommended maximum time that a controller may delay an interrupt due to interrupt coalescing	No Delay
Arbitration Burst (AB)	Feature 01h: Number of commands that may be executed at one time from a particular Submission Queue as power of 2 (2^n)	4 (2^4=16)
Associated Function Type	Controller associated with SR-IOV virtual function or PCI function type from CMIC	PCI
Asymmetric Namespace Access Change Notices	Controller support for asynchronous events Asymmetric Namespace Access Change Notices, from OAES	Not Supported
Asymmetric Namespace Access Reporting	Support for Asymmetric Namespace Access Reporting from CMIC	Not Supported
Asynchronous Event Request Limit (AERL)	Maximum number of concurrently outstanding Asynchronous Event Request commands supported by the controller	8
Atomic Write Unit Normal (AWUN)	Size of write in logical blocks guaranteed to be written atomically across all namespaces with any supported namespace format during normal operation	1
Atomic Write Unit Power Fail (AWUPF)	Size of write in logical blocks guaranteed to be written atomically across all namespaces with any supported namespace format during a power fail or error condition	1
Autonomous Power State Transition	Autonomous Power State Transition support, from APSTA	Supported
Autonomous Power State Transition Enable (APSTE)	Feature 0Ch: Autonomous power state transitions. Also see APSTA	Disabled

Available Space Below Threshold	Critical Warning: Available spare space has fallen below the threshold	No
Available Spare	Normalized percentage (0 to 100%) of the remaining spare capacity available	100 %
Available Spare Threshold	Available spare threshold indicated as a normalized percentage (0 to 100%)	10 %
Block Erase Sanitize	Controller support for block sanitize, from SANICAP	Supported
Command Retry Delay Time 1 (CRDT1)	If DNR is 0 and CRD is 01b in the Completion Queue Entry, indicates the command retry delay time	0 (0 mS)
Command Retry Delay Time 2 (CRDT2)	If DNR is 0 and CRD is 10b in the Completion Queue Entry, indicates the command retry delay time	0 (0 mS)
Command Retry Delay Time 3 (CRDT3)	If DNR is 0 and CRD is 11b in the Completion Queue Entry, indicates the command retry delay time	0 (0 mS)
Commands Supported and Effects Log Page	Controller support for log page attribute Commands Supported and Effects Log Page, from LPA	Supported
Compare NVM Command	Controller support for the Compare NVM command, from ONCS	Supported
Compare and Write Fused Operation	Controller support for the Compare and Write fused operation, from FUSES	Not Supported
Composite Temperature	Current composite temperature of the controller and namespace(s) associated with that controller	23 C
Composite Temperature Over Threshold	Feature 04h: Composite Temperature over threshold limit	80 C
Composite Temperature Under Threshold	Feature 04h: Composite Temperature under threshold limit	-5 C
Controller Busy Time	Time the controller is busy with I/O commands	19,015 Min
Controller ID (CNTLID)	NVM subsystem unique controller identifier associated with the controller	1
Controller Type (CNTRLTYPE)	Specifies the controller type (I/O, Discovery, or Administrator)	I/O Controller
Controller Vendor	Controller vendor from PCI lookup: https://pcisig.com/membership/member-companies	Sandisk
Critical Composite Temperature Threshold (CCTEMP)	Temperature that indicates a critical overheating condition (e.g. possible data loss, device shutdown, extreme throttling, or permanent damage)	85 C
Critical Composite Temperature Time	Time controller is operational and Composite Temperature is greater than the Critical Composite Temperature Threshold	2 Min
Critical Warnings	Controller has asserted one or more critical warnings	No

Crypto Erase	Crypto erase supported as part of secure erase, from FNA	Not Supported
Crypto Erase Sanitize	Controller support for crypto sanitize, from SANICAP	Not Supported
Current Number Of Errors	Current number of error entries in Log Page 1	0
Current Number Of Self-Tests	Current number of self tests reported in log page 6	20
Current Power State (PS)	Feature 02h: Current power state of the controller	0
Current Self-Test Completion	Percentage of the device self-test operation that is complete	0
Current Self-Test Operation	Status of the current device self-test operation	No Test In Progress
Data Read	Data Read in GB calculated from Data Units Read	416,309.647 GB
Data Units Read	Number of 512,000 byte data units read from the controller; does not include metadata	813,104,780
Data Units Written	Number of 512,000 byte data units written to the controller; does not include metadata	272,675,205
Data Written	Data Written in GB calculated from Data Units Written	139,609.705 GB
Dataset Management NVM Command	Controller support for the Dataset Management NVM command, from ONCS	Supported
Device Self-test Command	Controller support for Device Self-test Command, from OACS	Supported
Directive Send and Directive Receive Commands	Controller support for Directive Send and Directive Receive Commands, from OACS	Not Supported
Disable Normal (DN)	Feature 0Ah: Host specifies AWUN and NAWUN are not required and controller shall only honor AWUPF and NAWUPF	Not Supported
Doorbell Buffer Config Command	Controller support for Doorbell Buffer Config Command, from OACS	Not Supported
Driver	OS driver information	Microsoft, 10.0.22621.755, 6/20/2006, stornvme.inf
EG Available Space Below Threshold	Critical Warning: One or more Endurance Groups available spare space has fallen below the threshold	No
EG Critical Warnings	One or more Endurance Groups has asserted one or more critical warnings	No
EG Reliability Degraded	Critical Warning: One or more Endurance Groups reliability degraded due to significant media or internal errors	No
EG in Read Only	Critical Warning: One or more Endurance Groups media has been placed in read only mode	No
Enable Host Memory (EHM)	Feature 0Dh: Controller may use host memory buffer when enabled. See HMPRE	Enabled

Endurance Group Event Log Page Change Notices	Controller support for asynchronous events Endurance Group Event Log Page Change Notices, from OAES	Not Supported
Endurance Group Identifier Maximum (ENDGIDMAX)	Maximum value of a valid Endurance Group Identifier for any controller in the NVM subsystem	0
Endurance Groups	Controller support for Endurance Groups, from CTRATT	Not Supported
Error Log Page Entries (ELPE)	Maximum number of Error Information log entries stored by the controller	256
Extended Data for Get Log Page	Controller support for log page attribute Extended Data for Get Log Page, from LPA	Supported
Extended Device Self-test Time (EDSTT)	Nominal time in minutes to complete extended device self-test when in power state 0	44 Min
FRU Globally Unique Identifier (FGUID)	Globally unique identifier for the Field Replaceable Unit (FRU)	000000-000000000 000000000000000 00
Firmware Activation Notices	Controller support for asynchronous events Firmware Activation Notices, from OAES	Supported
Firmware Activation Notices Enable	Feature 0Bh: Asynchronous event notification sent to host for Firmware Activation Starting. Also see OAES	Enabled
Firmware Activation Without Reset	Controller support for firmware activation without a reset, from FRMW	Supported
Firmware Active Slot	Firmware slot that loaded the active firmware, from AFI	1
Firmware Commit and Image Download Commands	Controller support for Firmware Commit and Image Download Commands, from OACS	Supported
Firmware Pending Slot	Firmware slot to be activated at the next controller reset, from AFI	Not Reported
Firmware Revision (FR)	Currently active firmware revision	211070WD
Firmware Slot 1 Read Status	Firmware slot 1 read only or read/write, from FRMW	Read/Write
Firmware Slot 1 Revision	Revision of firmware in this slot, see Firmware Revision for Slot # (FRS#)	211070WD
Firmware Slot 2 Revision	Revision of firmware in this slot, see Firmware Revision for Slot # (FRS#)	
Firmware Slots	Number of firmware slots supported by controller, from FRMW	2
Firmware Update Granularity (FWUG)	Minimum granularity and alignment of the data provided in the Firmware Image Download command	4 KiB
Format All Namespaces	Format (excluding secure erase) applies to all namespaces in an NVM subsystem, from FNA	Not Supported

Format NVM Command	Controller support for Format NVM Command, from OACS	Supported
Get LBA Status capability	Controller support for the Get LBA Status capability, from OACS	Not Supported
High Priority Weight (HPW)	Feature 01h: Number of commands that may be executed from the high priority service class in each arbitration round	1
Highest Version Detected	Highest NVMe version detected based on supported features	1.4.0
Host Controlled Thermal Management (HCTMA)	Controller support for host controlled thermal management	Supported
Host Memory Buffer Minimum Descriptor Entry Size (HMMINDS)	Minimum usable size of a Host Memory Buffer Descriptor Entry	No limitations
Host Memory Buffer Minimum Size (HMMIN)	Minimum size that the host is requested to allocate for the Host Memory Buffer feature in 4KiB units	823 (3,292 KiB)
Host Memory Buffer Preferred Size (HMPRE)	Preferred size that the host is requested to allocate for the Host Memory Buffer feature in 4KiB units	51,200 (204,800 KiB)
Host Memory Buffer Size (HSIZE)	Feature 0Dh: Size of host memory buffer allocated in memory page size units	16,384
Host Memory Descriptor List Address (HMDLAL)	Feature 0Dh: Lower 32 bits of the physical location of the Host Memory Descriptor List for the Host Memory Buffer	0x043A1000
Host Memory Descriptor List Address (HMDLAU)	Feature 0Dh: Upper 32 bits of the physical location of the Host Memory Descriptor List for the Host Memory Buffer	0x00000001
Host Memory Descriptor List Entry Count (HMDLEC)	Feature 0Dh: Number of valid Host Memory Descriptor Entries	1
Host Memory Maximum Descriptors Entries (HMMAXD)	Number of usable Host Memory Buffer Descriptor Entries	8
Host Power Source	Current host power source, battery or AC	AC
Host Read Commands	Number of read commands completed by the controller	10,760,324,373
Host Timestamp	Host number of milliseconds since midnight, 01-Jan-1970, UTC	1,672,596,803,487 mS
Host Timestamp Decoded	Host date and time	2023-01-01 10:13:23.487
Host Write Commands	Number of write commands completed by the controller	5,997,051,692

IEEE OUI Identifier (IEEE)	Organization Unique Identifier (OUI) for the controller vendor: http://standards-oui.ieee.org/oui/oui.txt	00-1b-44
Keep Alive Support (KAS)	Granularity of the Keep Alive Timer	Not Supported
LBA Status Information Notices	Controller support for asynchronous events LBA Status Information Notices, from OAES	Not Supported
Low Priority Weight (LPW)	Feature 01h: Number of commands that may be executed from the low priority service class in each arbitration round	1
Maximum Completion Queue Entry Size	Maximum Completion Queue entry size when using the NVM Command Set in bytes reported as a power of two (2^n), from CQES	4 (2^4=16)
Maximum Data Transfer Size (MDTS)	Maximum data transfer size between host and controller in units of minimum memory page size as a power of two (2^n)	7 (2^7=128)
Maximum Number Allowed Namespaces (MNAN)	Maximum number of namespaces supported by the NVM subsystem	0
Maximum Outstanding Commands (MAXCMD)	Maximum number of commands that the controller processes at one time for a particular queue	Not Supported
Maximum Submission Queue Entry Size	Maximum Submission Queue entry size when using the NVM Command Set in bytes reported as a power of two (2^n), from SQES	6 (2^6=64)
Maximum Thermal Management Temperature (MXTMT)	Maximum temperature host may request in the Thermal Management Temperature 1 and 2 fields of Set Features command	85 C
Maximum Time for Firmware Activation (MTFA)	Maximum time the controller temporarily stops processing commands to activate the firmware image	5,000 mS
Media and Data Integrity Errors	Number of occurrences where the controller detected an unrecovered data integrity error	0
Media in Read Only	Critical Warning: Media has been placed in read only mode	No
Medium Priority Weight (MPW)	Feature 01h: Number of commands that may be executed from the medium priority service class in each arbitration round	1
Minimum Thermal Management Temperature (MNTMT)	Minimum temperature host may request in the Thermal Management Temperature 1 and 2 fields of Set Features command	0 C
Model Number (MN)	Model number for the NVM subsystem assigned by the vendor	WDC WDS250G2B0C-00PXH0
NVM Set Identifier Maximum (NSETIDMAX)	Maximum value of a valid NVM Set Identifier for any controller in the NVM subsystem	0
NVM Sets	Controller support for NVM Sets, from CTRATT	Not Supported

NVM Subsystem Controllers	Single or multiple controllers contained in NVM subsystem from CMIC	Single
NVM Subsystem NVMe Qualified Name (SUBNQN)	The NVM Subsystem NVMe Qualified Name	nqn.2018-01.com.wdc:nguid:E8238FA6BF53-0001-001B448B49BC0ECB
NVM Subsystem PCIe Ports	Single or multiple PCIE ports contained in NVM subsystem from CMIC	Single
NVME MI Send/Receive Commands	Controller support for NVME MI Send/Receive Commands, from OACS	Not Supported
Namespace 1 ANA Group Identifier (ANAGRPID)	ANA Group Identifier of the ANA group of which the namespace is a member	Not Reported
Namespace 1 Active LBA Format	Index of LBA format that namespace is formatted with, from FLBAS	0
Namespace 1 Atomic Boundary Offset (NABO)	The LBA on this namespace where the first atomic boundary starts	7
Namespace 1 Atomic Boundary Size Normal (NABSN)	Atomic boundary size in logical blocks for this namespace for the NAWUN value	7
Namespace 1 Atomic Boundary Size Power Fail (NABSPF)	Atomic boundary size for this namespace specific to the Namespace Atomic Write Unit Power Fail value	7
Namespace 1 Atomic Compare & Write Unit (NACWU)	Namespace specific size of the write operation in logical blocks guaranteed to be written atomically for a Compare and Write fused command	Same as ACWU
Namespace 1 Atomic Write Unit Normal (NAWUN)	Namespace specific size of the write operation in logical blocks guaranteed to be written atomically during normal operation	7
Namespace 1 Atomic Write Unit Power Fail (NAWUPF)	Namespace specific size of the write operation in logical blocks guaranteed to be written atomically during a power fail or error condition	7
Namespace 1 Atomic Writes	If supported NAWUN, NAWUPF, and NACWU used instead of AWUN, AWUPF, and ACWU fields, from NSFEAT	Supported
Namespace 1 Capacity (NCAP)	The maximum number of logical blocks that may be allocated in the namespace	488,397,168
Namespace 1 Deallocate Bit in Write Zeros	Controller support for the Deallocate bit in the Write Zeros command for this namespace, from DLFEAT	Supported
Namespace 1 Deallocate Guard Field	Guard field for deallocated logical blocks that contain protection information is set to the CRC for the value read from the deallocated logical block, from DLFEAT	Not Supported

Namespace 1 Deallocate Logical Block Value	Values read from a deallocated logical block and its metadata, from DLFEAT	All 00h
Namespace 1 Endurance Group Identifier (ENDGID)	Endurance Group with which this namespace is associated	Not Supported
Namespace 1 Exclusive Access All Registrants Reservation	Namespace supports the Exclusive Access - All Registrants reservation type, from RESCAP	Not Supported
Namespace 1 Exclusive Access Registrants Only Reservation	Namespace supports the Exclusive Access - Registrants Only reservation type, from RESCAP	Not Supported
Namespace 1 Exclusive Access Reservation	Namespace supports the Exclusive Access reservation type, from RESCAP	Not Supported
Namespace 1 Extended Data LBA	If supported metadata is transferred at the end of the data LBA, creating an extended data LBA, from FLBAS	Not Supported
Namespace 1 Format Percent Complete	Percentage of the Format NVM command that remains to be completed, from FPI	0
Namespace 1 Format Progress Indicator	Namespace supports the Format Progress Indicator, from FPI	Supported
Namespace 1 Globally Unique Identifier (NGUID)	128-bit value that is globally unique and assigned to the namespace	e8238fa6bf530001-001b44-8b49bc0ecb
Namespace 1 IEEE Extended Unique Identifier (EUI64)	64-bit IEEE Extended Unique Identifier (EUI-64) that is globally unique and assigned to the namespace	001b44-8b49bc0ecb
Namespace 1 IO Optimize Fields	Fields NPWG, NPWA, NPDG, NPDA, and NOWS are defined for namespace and should be used for I/O optimization, from NSFEAT	Not Supported
Namespace 1 Ignore Existing Key Specification	Ignore Existing Key is used as defined in revision 1.2.1 or 1.3+ of NVMe specification, from RESCAP	1.2.1 or earlier
Namespace 1 LBA 0 Data Size (LBADS)	LBA data size in power of two (2^n)	9 (2^9=512) *
Namespace 1 LBA 0 Relative Performance (RP)	Relative performance of this LBA format relative to other LBA formats	Good Performance *
Namespace 1 LBA 1 Data Size (LBADS)	LBA data size in power of two (2^n)	12 (2^{12}=4096)
Namespace 1 LBA 1 Relative Performance (RP)	Relative performance of this LBA format relative to other LBA formats	Better Performance

Namespace 1 Logical Block Error	Controller support for the Deallocated or Unwritten Logical Block error for this namespace, from NSFEAT	Not Supported
Namespace 1 Metadata Transfer Buffer	Metadata transferred as part of a separate buffer that is specified in the Metadata Pointer, from MC	Not Supported
Namespace 1 Metadata Transfer Extended LBA	Metadata being transferred as part of an extended data LBA, from MC	Not Supported
Namespace 1 NGUID/EUID Not Reused	If supported non-zero NGUID and EUI64 fields for this namespace are never reused by the controller, from NSFEAT	Not Supported
Namespace 1 NVM Capacity (NVMCAP)	Total size of the NVM allocated to this namespace in bytes	250,059,350,016
Namespace 1 NVM Set Identifier (NVMSETID)	The NVM Set with which this namespace is associated	Not Supported
Namespace 1 Number of LBA Formats (NLBAF)	Number of supported LBA data size and metadata size combinations supported by the namespace	2
Namespace 1 Optimal IO Boundary (NOIOB)	Optimal IO boundary in logical blocks for this namespace	Not Reported
Namespace 1 Optimal Write Size (NOWS)	Size in logical blocks for optimal write performance for this namespace	1
Namespace 1 Persist Through Power Loss	Namespace supports the Persist Through Power Loss capability, from RESCAP	Not Supported
Namespace 1 Preferred Deallocate Alignment (NPDA)	Recommended alignment in logical blocks for the Dataset Management command with the Attribute Ö Deallocate bit set to 1	1
Namespace 1 Preferred Deallocate Granularity (NPDG)	Recommended granularity in logical blocks for the Dataset Management command with the Attribute Ö Deallocate bit set to 1	1
Namespace 1 Preferred Write Alignment (NPWA)	Recommended write alignment in logical blocks for this namespace	1
Namespace 1 Preferred Write Granularity (NPWG)	Smallest recommended write granularity in logical blocks for this namespace	1
Namespace 1 Protection First	Namespace supports protection information transferred as first eight bytes of metadata, from DPC	Not Supported

Namespace 1 Protection Information Enabled	Type of Protection Information enabled, if any, from DPS	Disabled
Namespace 1 Protection Information First	Protection information, if enabled, is transferred as the first eight bytes of metadata, from DPS	Last 8 Bytes
Namespace 1 Protection Last	Namespace supports protection information transferred as the last eight bytes of metadata, from DPC	Not Supported
Namespace 1 Protection Type 1	Namespace supports Protection Information Type 1, from DPC	Not Supported
Namespace 1 Protection Type 2	Namespace supports Protection Information Type 2, from DPC	Not Supported
Namespace 1 Protection Type 3	Namespace supports Protection Information Type 3, from DPC	Not Supported
Namespace 1 Shared	Namespace may be attached to two or more controllers in the NVM subsystem concurrently (i.e., may be a shared namespace), from NMIC	Not Supported
Namespace 1 Size	Total calculated size of the namespace in GB	250 GB
Namespace 1 Size in GiB	Total calculated size of the namespace in GiB (1024*1024*1024)	232.9 GiB
Namespace 1 Size in LBA (NSZE)	Total size of this namespace in logical blocks	488,397,168
Namespace 1 Thin Provisioning	If supported the Namespace Capacity reported may be less than the Namespace Size, from NSFEAT	Not Supported
Namespace 1 Utilization (NUSE)	Current number of logical blocks allocated in the namespace	488,397,168
Namespace 1 Write Exclusive All Registrants Reservation	Namespace supports the Write Exclusive - All Registrants reservation type, from RESCAP	Not Supported
Namespace 1 Write Exclusive Registrants Only Reservation	Namespace supports the Write Exclusive - Registrants Only reservation type, from RESCAP	Not Supported
Namespace 1 Write Exclusive Reservation	Namespace supports the Write Exclusive reservation type, from RESCAP	Not Supported
Namespace 1 Write Protected	Namespace is currently write protected due to any condition	No
Namespace Attribute Notices	Controller support for asynchronous events Namespace Activation Notices, from OAES	Not Supported
Namespace Granularity	Controller support for reporting of Namespace Granularity, from CTRATT	Not Supported

Namespace Management and Attachment Commands	Controller support for Namespace Management and Attachment Commands, from OACS	Not Supported
No-Deallocate Inhibited (NDI)	Controller support for No-Deallocate Inhibited (NDI), from SANICAP	Supported
No-Deallocate Modifies Media After Sanitize (NODMMAS)	Indicates if media is modified by controller after a sanitize command started with No-Deallocate After Sanitize bit set to 1, from SANICAP	Media not modified
Non-Operational Power State Permissive Mode	Controller support for temporary exceeding power in non-operational power state for background operation, from CTRATT	Supported
Non-Operational Power State Permissive Mode Enable (NOPPME)	Feature 11h: Controller may temporarily exceed the power limits of any non-operational power state to run controller initiated background operations	Disabled
Non-zero ANAGRPID	Controller support for a non-zero value in the ANAGRPID field of the Namespace Management command, from ANACAP	Not Supported
Number Of Failed Self-Tests	Number of self tests that failed in log page 6	0
Number of ANA Group Identifiers (NANAGRPID)	Number of ANA groups supported by this controller	Not Supported
Number of Error Information Log Entries	Number of Error Information log entries over the life of the controller	1
Number of Namespaces (NN)	Number of valid namespaces present for the controller	1
Number of Power States Support (NPSS)	Number of NVM Express power states supported by the controller	5
OS Location	Drive location reported by the Operating System	\\.\PHYSICALDRIVE1
One Self-Test	Support for one device self-test at a time per system or per controller, from DSTO	Per System
Overwrite Sanitize	Controller support for overwrite sanitize, from SANICAP	Not Supported
PCI Device ID	PCI device identifier assigned for the device	0x5009
PCI Location	PCI bus address in the system	Bus 1, device 0, function 0
PCI Rated Speed	Maximum PCI bus speed the device is rated for	Gen3 8.0GT/s
PCI Rated Width	Maximum PCI bus width the device is rated for	x4
PCI Speed	Current PCI bus speed	Gen3 8.0GT/s
PCI Subsystem Vendor ID (SSVID)	Company vendor identifier assigned by PCI SIG for the subsystem	0x15B7

PCI Vendor ID (VID)	Company vendor identifier assigned by PCI SIG for the controller	0x15B7
PCI Width	Current PCI bus width in lanes	x4
PCIe Management Endpoint (PCIEME)	NVME MI: NVM Subsystem contains a Management Endpoint on a PCIe port	Not Supported
Percentage Used	Vendor specific estimate of the percentage life used, can exceed 100%	19 %
Permanent Write Protect	Controller support for the Permanent Write Protect state, from NWPC	Not Supported
Persistent Event Log	Controller support for log page attribute Persistent Event Log, from LPA	Supported
Persistent Event Log Size (PELS)	Maximum reportable size for the Persistent Event Log	64 KiB
Persistent Memory Unreliable	Critical Warning: Persistent Memory Region has become read-only or unreliable	No
Power Cycles	Number of power cycles	199
Power On Hours	Number of power on hours	2,128
Power State 0 Active Power (ACTP)	Largest average power over 10 seconds in this power state with workload from Active Power Workload (APW)	1.8 Watts
Power State 0 Active Power Workload (APW)	Workload used to calculate maximum power for the active power state	Workload #2
Power State 0 Entry Latency (ENLAT)	Maximum entry latency in microseconds associated with entering this power state	Not Reported
Power State 0 Exit Latency (EXLAT)	Maximum exit latency in microseconds associated with exiting this power state	Not Reported
Power State 0 Idle Power (IDLP)	Typical power consumed over 30 seconds in this power state when idle	0.63 Watts
Power State 0 Idle Time Prior to Transition (ITPT)	Feature 0Ch: Idle time that occurs in this power state prior to transitioning to the Idle Transition Power State in milliseconds	Disabled
Power State 0 Maximum Power (MP)	Maximum power consumed in this power state	3.5 Watts
Power State 0 Non-Operational State (NOPS)	Controller does not process I/O commands in a Non-Operational State	False
Power State 0 Relative Read Latency (RRL)	Relative read latency associated with this power state	0
Power State 0 Relative Read Throughput (RRT)	Relative read throughput associated with this power state	0

Power State 0 Relative Write Latency (RWL)	Relative write latency associated with this power state	0
Power State 0 Relative Write Throughput (RWT)	Relative write throughput associated with this power state	0
Power State 1 Active Power (ACTP)	Largest average power over 10 seconds in this power state with workload from Active Power Workload (APW)	1.6 Watts
Power State 1 Active Power Workload (APW)	Workload used to calculate maximum power for the active power state	Workload #2
Power State 1 Entry Latency (ENLAT)	Maximum entry latency in microseconds associated with entering this power state	Not Reported
Power State 1 Exit Latency (EXLAT)	Maximum exit latency in microseconds associated with exiting this power state	Not Reported
Power State 1 Idle Power (IDLP)	Typical power consumed over 30 seconds in this power state when idle	0.63 Watts
Power State 1 Idle Time Prior to Transition (ITPT)	Feature 0Ch: Idle time that occurs in this power state prior to transitioning to the Idle Transition Power State in milliseconds	Disabled
Power State 1 Maximum Power (MP)	Maximum power consumed in this power state	2.4 Watts
Power State 1 Non-Operational State (NOPS)	Controller does not process I/O commands in a Non-Operational State	False
Power State 1 Relative Read Latency (RRL)	Relative read latency associated with this power state	0
Power State 1 Relative Read Throughput (RRT)	Relative read throughput associated with this power state	0
Power State 1 Relative Write Latency (RWL)	Relative write latency associated with this power state	0
Power State 1 Relative Write Throughput (RWT)	Relative write throughput associated with this power state	0
Power State 2 Active Power (ACTP)	Largest average power over 10 seconds in this power state with workload from Active Power Workload (APW)	1.5 Watts
Power State 2 Active Power Workload (APW)	Workload used to calculate maximum power for the active power state	Workload #2

Power State 2 Entry Latency (ENLAT)	Maximum entry latency in microseconds associated with entering this power state	Not Reported
Power State 2 Exit Latency (EXLAT)	Maximum exit latency in microseconds associated with exiting this power state	Not Reported
Power State 2 Idle Power (IDLP)	Typical power consumed over 30 seconds in this power state when idle	0.63 Watts
Power State 2 Idle Time Prior to Transition (ITPT)	Feature 0Ch: Idle time that occurs in this power state prior to transitioning to the Idle Transition Power State in milliseconds	Disabled
Power State 2 Maximum Power (MP)	Maximum power consumed in this power state	1.9 Watts
Power State 2 Non-Operational State (NOPS)	Controller does not process I/O commands in a Non-Operational State	False
Power State 2 Relative Read Latency (RRL)	Relative read latency associated with this power state	0
Power State 2 Relative Read Throughput (RRT)	Relative read throughput associated with this power state	0
Power State 2 Relative Write Latency (RWL)	Relative write latency associated with this power state	0
Power State 2 Relative Write Throughput (RWT)	Relative write throughput associated with this power state	0
Power State 3 Active Power (ACTP)	Largest average power over 10 seconds in this power state with workload from Active Power Workload (APW)	Not Reported
Power State 3 Active Power Workload (APW)	Workload used to calculate maximum power for the active power state	No workload
Power State 3 Entry Latency (ENLAT)	Maximum entry latency in microseconds associated with entering this power state	3,900 uS (0.003 sec)
Power State 3 Exit Latency (EXLAT)	Maximum exit latency in microseconds associated with exiting this power state	11,000 uS (0.011 sec)
Power State 3 Idle Power (IDLP)	Typical power consumed over 30 seconds in this power state when idle	0.02 Watts
Power State 3 Idle Time Prior to Transition (ITPT)	Feature 0Ch: Idle time that occurs in this power state prior to transitioning to the Idle Transition Power State in milliseconds	Disabled
Power State 3 Maximum Power (MP)	Maximum power consumed in this power state	0.02 Watts

Power State 3 Non-Operational State (NOPS)	Controller does not process I/O commands in a Non-Operational State	True
Power State 3 Relative Read Latency (RRL)	Relative read latency associated with this power state	3
Power State 3 Relative Read Throughput (RRT)	Relative read throughput associated with this power state	3
Power State 3 Relative Write Latency (RWL)	Relative write latency associated with this power state	3
Power State 3 Relative Write Throughput (RWT)	Relative write throughput associated with this power state	3
Power State 4 Active Power (ACTP)	Largest average power over 10 seconds in this power state with workload from Active Power Workload (APW)	Not Reported
Power State 4 Active Power Workload (APW)	Workload used to calculate maximum power for the active power state	No workload
Power State 4 Entry Latency (ENLAT)	Maximum entry latency in microseconds associated with entering this power state	5,000 uS (0.005 sec)
Power State 4 Exit Latency (EXLAT)	Maximum exit latency in microseconds associated with exiting this power state	39,000 uS (0.039 sec)
Power State 4 Idle Power (IDLP)	Typical power consumed over 30 seconds in this power state when idle	0.005 Watts
Power State 4 Idle Time Prior to Transition (ITPT)	Feature 0Ch: Idle time that occurs in this power state prior to transitioning to the Idle Transition Power State in milliseconds	Disabled
Power State 4 Maximum Power (MP)	Maximum power consumed in this power state	0.005 Watts
Power State 4 Non-Operational State (NOPS)	Controller does not process I/O commands in a Non-Operational State	True
Power State 4 Relative Read Latency (RRL)	Relative read latency associated with this power state	4
Power State 4 Relative Read Throughput (RRT)	Relative read throughput associated with this power state	4
Power State 4 Relative Write Latency (RWL)	Relative write latency associated with this power state	4

Power State 4 Relative Write Throughput (RWT)	Relative write throughput associated with this power state	4
Predictable Latency Event Log Change Notices	Controller support for asynchronous events Predictable Latency Event Log Change Notices, from OAES	Not Supported
Predictable Latency Mode	Controller support for Predictable Latency Mode, from CTRATT	Not Supported
RTD3 Entry Latency (RTD3E)	Typical latency to enter Runtime D3 in microseconds	1,000,000 uS (1.000 sec)
RTD3 Resume Latency (RTD3R)	Typical latency resuming from Runtime D3 in microseconds	500,000 uS (0.500 sec)
Read Recovery Levels	Controller support for Read Recovery Levels, from CTRATT	Not Supported
Read Recovery Levels Supported (RRLS)	Controller supported Read Recovery Levels	0x0000
Recommended Arbitration Burst (RAB)	Recommended number of commands that may be executed at one time from a particular Submission Queue as a power of two (2^n)	4 (2^4=16)
Reliability Degraded	Critical Warning: Reliability degraded due to significant media or internal errors	No
Replay Protected Memory Blocks (RPMBS)	Replay Protected Memory Blocks store data to a specific memory area in an authenticated and replay protected manner	Not Supported
Report ANA Change state	Controller is able to report ANA Change state, from ANACAP	Not Supported
Report ANA Inaccessible state	Controller is able to report ANA Inaccessible state, from ANACAP	Not Supported
Report ANA Non-Optimized state	Controller is able to report ANA Non-Optimized state, from ANACAP	Not Supported
Report ANA Optimized state	Controller is able to report ANA Optimized state, from ANACAP	Not Supported
Report ANA Persistent Loss state	Controller is able to report ANA Persistent Loss state, from ANACAP	Not Supported
Required Completion Queue Entry Size	Required Completion Queue entry size when using the NVM Command Set in bytes reported as a power of two (2^n), from CQES	4 (2^4=16)
Required Submission Queue Entry Size	Required Submission Queue entry size when using the NVM Command Set in bytes reported as a power of two (2^n), from SQES	6 (2^6=64)
Reservations	Controller support for reservations, from ONCS	Not Supported
Root PCI Device ID	PCI device identifier assigned for the root device	0xA340
Root PCI Location	PCI bus address for the root device	Bus 0, device 27, function 0

Root PCI Vendor ID	PCI vendor identifier assigned for the root device	0x8086
SGL support in NVM command	SGL support for the NVM Command Set	Not Supported
SMART Critical Warning Notices Enable	Feature 0Bh: Asynchronous event notifications sent to host for SMART Critical Warnings	0x1F
SMART/Health Log Page per Namespace	Controller support for log page attribute SMART/Health Log Page per Namespace, from LPA	Not Supported
SMBus Management Endpoint (SMBUSME)	NVME MI: NVM Subsystem contains a Management Endpoint on an SMBus/I2C port	Not Supported
SQ Associations	Controller support for SQ Associations, from CTRATT	Not Supported
Save/Select Fields in Features Command	Controller support for Save and Select Fields in Features Command, from ONCS	Supported
Secure Erase All Namespaces	Secure erase applies to all namespaces in an NVM subsystem, from FNA	Not Supported
Security Send and Security Receive Command	Controller support for Security Send and Security Receive Command, from OACS	Supported
Self-Test 1 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,128
Self-Test 1 Result	Result of Self-Test	Passed
Self-Test 1 Result Code	Numeric code returned by Self-Test	0
Self-Test 1 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 10 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,122
Self-Test 10 Result	Result of Self-Test	Passed
Self-Test 10 Result Code	Numeric code returned by Self-Test	0
Self-Test 10 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 11 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,122
Self-Test 11 Result	Result of Self-Test	Passed
Self-Test 11 Result Code	Numeric code returned by Self-Test	0
Self-Test 11 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 12 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,121
Self-Test 12 Result	Result of Self-Test	Passed
Self-Test 12 Result Code	Numeric code returned by Self-Test	0

Self-Test 12 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 13 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,121
Self-Test 13 Result	Result of Self-Test	Passed
Self-Test 13 Result Code	Numeric code returned by Self-Test	0
Self-Test 13 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 14 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,121
Self-Test 14 Result	Result of Self-Test	Passed
Self-Test 14 Result Code	Numeric code returned by Self-Test	0
Self-Test 14 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 15 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,121
Self-Test 15 Result	Result of Self-Test	Passed
Self-Test 15 Result Code	Numeric code returned by Self-Test	0
Self-Test 15 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 16 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,120
Self-Test 16 Result	Result of Self-Test	Passed
Self-Test 16 Result Code	Numeric code returned by Self-Test	0
Self-Test 16 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 17 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,120
Self-Test 17 Result	Result of Self-Test	Passed
Self-Test 17 Result Code	Numeric code returned by Self-Test	0
Self-Test 17 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 18 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,119
Self-Test 18 Result	Result of Self-Test	Passed
Self-Test 18 Result Code	Numeric code returned by Self-Test	0
Self-Test 18 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 19 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,115
Self-Test 19 Result	Result of Self-Test	Passed
Self-Test 19 Result Code	Numeric code returned by Self-Test	0

Self-Test 19 Type	Type of Self-Test (short, extended or vendor)	Extended Test
Self-Test 2 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,128
Self-Test 2 Result	Result of Self-Test	Passed
Self-Test 2 Result Code	Numeric code returned by Self-Test	0
Self-Test 2 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 20 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,114
Self-Test 20 Result	Result of Self-Test	Passed
Self-Test 20 Result Code	Numeric code returned by Self-Test	0
Self-Test 20 Type	Type of Self-Test (short, extended or vendor)	Extended Test
Self-Test 3 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,124
Self-Test 3 Result	Result of Self-Test	Passed
Self-Test 3 Result Code	Numeric code returned by Self-Test	0
Self-Test 3 Type	Type of Self-Test (short, extended or vendor)	Extended Test
Self-Test 4 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,123
Self-Test 4 Result	Result of Self-Test	Passed
Self-Test 4 Result Code	Numeric code returned by Self-Test	0
Self-Test 4 Type	Type of Self-Test (short, extended or vendor)	Extended Test
Self-Test 5 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,123
Self-Test 5 Result	Result of Self-Test	Passed
Self-Test 5 Result Code	Numeric code returned by Self-Test	0
Self-Test 5 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 6 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,123
Self-Test 6 Result	Result of Self-Test	Passed
Self-Test 6 Result Code	Numeric code returned by Self-Test	0
Self-Test 6 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 7 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,122
Self-Test 7 Result	Result of Self-Test	Passed
Self-Test 7 Result Code	Numeric code returned by Self-Test	0

Self-Test 7 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 8 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,122
Self-Test 8 Result	Result of Self-Test	Passed
Self-Test 8 Result Code	Numeric code returned by Self-Test	0
Self-Test 8 Type	Type of Self-Test (short, extended or vendor)	Short Test
Self-Test 9 Power On Hours	Number of power-on hours at the time the device self-test operation was completed or aborted	2,122
Self-Test 9 Result	Result of Self-Test	Passed
Self-Test 9 Result Code	Numeric code returned by Self-Test	0
Self-Test 9 Type	Type of Self-Test (short, extended or vendor)	Short Test
Serial Number (SN)	Serial number for the NVM subsystem assigned by the vendor	2035A0805352
Size	Size in bytes	250000000000.0
Size in GiB	Total calculated size in GiB (1024*1024*1024)	232.9 GiB
Subsystem Vendor	Subsystem vendor from PCI lookup: https://pcisig.com/membership/member-companies	Sandisk
Telemetry Log Notices	Controller support for log page attribute Telemetry Log Notices, from LPA	Supported
Telemetry Log Notices Enable	Feature 0Bh: Asynchronous event notification sent to host for when telemetry data available. Also see LPA	Enabled
Temperature Over/Under Threshold	Critical Warning: A temperature is over or under a temperature threshold	No
Thermal Management Temperature 1 (TMT1)	Feature 10h: Temperature the controller transitions to lower active power states or other vendor specific actions while minimizing the impact on performance	Disabled
Thermal Management Temperature 1 Count	Number of times the controller transitioned to lower power active power states or performed vendor specific thermal management actions while minimizing the impact on performance	0
Thermal Management Temperature 1 Time	Number of seconds controller had transitioned to lower power active power states or performed vendor specific thermal management actions while minimizing the impact on performance	0 Sec
Thermal Management Temperature 2 (TMT2)	Feature 10h: Temperature the controller transitions to lower active power states or other vendor specific actions regardless of the impact on performance	Disabled
Thermal Management Temperature 2 Count	Number of times the controller transitioned to lower power active power states or performed vendor specific thermal management actions regardless of the impact on performance	0

Thermal Management Temperature 2 Time	Number of seconds controller had transitioned to lower power active power states or performed vendor specific thermal management actions regardless of the impact on performance	0 Sec
Timestamp	Feature 0Eh: Number of milliseconds since controller reset or host value (midnight, 01-Jan-1970, UTC)	1,672,318,103,805 mS
Timestamp Decoded	Feature 0Eh: Either date or time since controller reset depending on timestamp origin	2022-12-29 04:48:23.805
Timestamp Feature	Controller support for Timestamp in Features Command, from ONCS	Supported
Timestamp Origin	Feature 0Eh: Timestamp is time from controller reset or host programmed value	Host Programmed
Timestamp Stopped	Feature 0Eh: Timestamp may have stopped counting in some conditions (e.g. non-operational power states)	True
Traffic Based Keep Alive Support	Controller support for restarting the Keep Alive Timer if an Admin command or an I/O command is processed during the Keep Alive Timeout Interval, from CTRATT	Not Supported
UUID List	Controller support for reporting of a UUID List, from CTRATT	Not Supported
Unchanged ANAGRPID	ANAGRPID field does not change while the namespace is attached to any controller, from ANACAP	Not Supported
Unsafe Shutdowns	Number of unsafe shutdowns	27
Vendor Specific Command Configuration	NVM Vendor Specific Commands use vendor specific or other format defined in NVMe specification, from NVSCC	Not Vendor Specific
Verify NVM Command	Controller support for Verify NVM Command, from ONCS	Not Supported
Version (VER)	NVMe version: https://nvmexpress.org/developers/nvme-specification/	1.4.0
Virtualization Mgt Command	Controller support for Virtualization Mgt Command, from OACS	Not Supported
Volatile Backup Failed	Critical Warning: Volatile memory backup device, if present, has failed	No
Volatile Write Cache (VWC)	Presence of a volatile write cache, from VWC	Supported
Volatile Write Cache Enable (WCE)	Feature 06h: Volatile write cache enable	Enabled
Volatile Write Cache Flush All NSID	Volatile Write Cache (VWC) flush command behavior if the NSID value is set to FFFFFFFFh, from VWC	Supported
Warning Composite Temperature Threshold (WCTEMP)	Temperature that indicates an overheating condition where controller operation continues	80 C

Epic NVMe Utilities WDC WDS250G2B0C-00PXH0

Warning Composite Temperature Time	Time controller is operational and Composite Temperature is greater than or equal to Warning Composite Temperature Threshold and less than the Critical Composite Temperature Threshold	64 Min
Windows Power ASPM (AC)	Windows OS Power Setting for PCIe ASPM when host on AC power	Attempt L1
Windows Power ASPM (DC)	Windows OS Power Setting for PCIe ASPM when host on battery power	Attempt L1
Windows Power NOPPME (AC)	Windows OS power setting for NOPPME when host on AC power	Not Supported
Windows Power NOPPME (DC)	Windows OS power setting for NOPPME when host on battery power	Not Supported
Windows Power NVMe Latency 1 (AC)	Windows OS Power Setting. After timeout 1, change to lowest power state with entry+exit latency less than this when host on AC power	50 mS
Windows Power NVMe Latency 1 (DC)	Windows OS Power Setting. After timeout 1, change to lowest power state with entry+exit latency less than this when host on battery power	5 mS
Windows Power NVMe Latency 2 (AC)	Windows OS Power Setting. After timeout 2, change to lowest power state with entry+exit latency less than this when host on AC power	100 mS
Windows Power NVMe Latency 2 (DC)	Windows OS Power Setting. After timeout 2, change to lowest power state with entry+exit latency less than this when host on battery power	100 mS
Windows Power NVMe Timeout 1 (AC)	Windows OS Power Setting. Timeout to transition NVMe to first lower power state when host on AC power	100 mS
Windows Power NVMe Timeout 1 (DC)	Windows OS Power Setting. Timeout to transition NVMe to first lower power state when host on battery power	100 mS
Windows Power NVMe Timeout 2 (AC)	Windows OS Power Setting. Timeout to transition NVMe to second lower power state when host on AC power	800 mS
Windows Power NVMe Timeout 2 (DC)	Windows OS Power Setting. Timeout to transition NVMe to second lower power state when host on battery power	1000 mS
Windows Power Plan	Name of active Windows OS Power Plan	HP Optimized (recommended)
Workload Hint (WH)	Feature 02h: Type of workload expected for a given power state	0
Write Protect Namespace States	Controller support for No Write Protect and Write Protect namespace write protection states and may support the Write Protect Until Power Cycle state and Permanent Write Protect namespace write protection states, from NWPC	Not Supported
Write Protect Until Power Cycle	Controller support for the Write Protect Until Power Cycle state, from NWPC	Not Supported

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Write Uncorrectable NVM Command	Controller support for the Write Uncorrectable NVM command, from ONCS	Supported
Write Zeroes NVM Command	Controller support for the Write Zeroes NVM command, from ONCS	Supported
Data Used	Percent of TBW used	93.0731366666666 6
TBW	Specification for Terabytes Written	150
Warranty Used	Percent of Warranty Used	14.5753424657534 24
Warranty Hours	Warranty In Hours	14600
Warranty Years	Warranty In Years	5
Size GB	Size in GB	250 GB
Model No Spaces	Model name with file friendly format	WDC_WDS250G2 B0C-00PXH0
Model	Model name in friendly format	WDC WDS250G2B 0C-00PXH0
Seconds Throttled	Total time throttled in seconds	3960 Sec
Percent Throttled	Total time throttled in percent of power on hours	0.1 %
Namespace 1 Active LBA Size	Size in bytes of the active LBA for Namespace 1	512

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