

Oracle 6.8 TB (max 7.68 TB), 2.5-inch, NVMe Solid State Drive Specification

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This document provides the specification for Oracle 6.8 Tbyte (max 7.68 TB), 2.5-inch, NVMe Solid State Drive Specification.

NVMe Storage Drive Installation

For detailed instructions on how to install Oracle 6.8 Tbyte (max 7.68 TB), 2.5-inch, NVMe Solid State Drive, refer to your server service documentation or drive enclosure documentation at <https://docs.oracle.com>.

The Drive Bracket Assembly consists of the solid state drive assembled within the bracket assembly. The Drive Bracket Assembly should not be disassembled for any reason by the user.

NVMe Storage Drive Specification 8204576

General specifications are listed in the following table.

Specification	Value
Device name	<ul style="list-style-type: none"> ■ Product Identifier: SSDPF2KX076T9S ■ Oracle Part Number: 8204576 ■ Device Identification: <ul style="list-style-type: none"> ■ Designation: SE=Standard Endurance ■ PCIe Device ID: 0x0B60 ■ Subsystem PCIe Vendor ID: 0x8086 ■ Subsystem ID 0x487C
Manufacturing name	6.8TB Intel D7-P5520 , 3D NAND TLC SFF 2.5-inch Solid State Drive
Form factors	<ul style="list-style-type: none"> ■ 2.5-inch SFF (small form factor): U.2 ■ SFF-8639 compatible connector
PCIe interface	PCIe Gen4 Interface, x4 lanes
Features	<ul style="list-style-type: none"> ■ NVMe PCIe Gen4 Interface ■ NVMe-MI (MCTP) ■ VPD per NVMe-MI Ver 1.0a specification ■ Opal 2.0
Product Compliance	<ul style="list-style-type: none"> ■ NVM Express Specification Rev. 1.3c ■ PCI Express Base Specification Rev. 4.0 ■ Enterprise SSD Form Factor Version 1.0a ■ NVMe-MI Rev 1.0a
Product ecological compliance	RoHS
Certifications and declarations	cUL-us, CE, TUV-GS, CB, CE, BSMI, KCC, Morocco, VCCI, RCM, FCC, IC

TABLE 1 Drive Usage Information

Usage	Description
Operating temperature (Case)	0 to 70 degrees Celsius
Non-Operating temperature	-40 to 95 degrees Celsius
Maximum temperature (SMART trip)	Thermal Throttling at 70 degrees Celsius (SMART) when approaching maximum temperature. Thermal Shutdown at 80 degrees Celsius (SMART)
Error rates	Uncorrectable Bit Error Rate (UBER): 1 sector per 10 ¹⁷ bits read

Usage	Description
Data retention	3 months powered off at 40 degrees Celsius at end of rated endurance
Endurance	<ul style="list-style-type: none"> ■ Drive Writes Per Day (DWPD) for 5 years: 3 ■ PBW (at 4KB Random Write) 30 PB <p>Refer to the JEDEC JESD218A standard for SSD device life and endurance measurement techniques.</p>

TABLE 2 Drive Reliability

Attribute	Value
Component Design Life (Useful life)	5 years
MTBF	2,000,000 hours
Expected AFR (Annualized Failure Rate)	0.44% for normal 24x7 operating conditions

TABLE 3 Drive Capacity and Performance

Attribute	Value
Capacity, formatted	Default Formatted Capacity: 6,801,330,364,416 bytes Sector Size (LBA size): 512 bytes per sector
Capacity, unformatted	Unformatted Capacity (Total User Addressable LBA): 13283848368 (max 7.68 TB)
Capacity, raw NAND	8192 GiB
Random 4 KB Read	1 M IOPS Typical 4 KB Random Read QD=1, Worker=1: 78us
Random 4 KB Write	Random 4 KB Write 250K IOPS Typical 4 KB Random Write QD=1, Worker=1: 15us
Sequential Read	128 KB, QD 128, Worker=1: 7,000 MB/s
Sequential Write	128 KB, QD 128, Worker=1: 4,100 MB/s
Interface data transfer rate	<ul style="list-style-type: none"> ■ Interface Data Rate: PCIe Gen 4 ■ Data Transfer Rate 16 GT/sec ■ Interface drivers/receivers SFF: 1x4 lanes

TABLE 4 Drive Electrical Specifications

Attribute	Value
Power On to Ready (no rebuild)	RTD3R: 10 seconds
Power On to Ready (full rebuild)	18 seconds
Supply Voltage / Tolerance	12 V +10%/-20% 3.3 Vaux +/-15%
Supply Average Current	12 V: 2.45 A 3.3 Vaux: 5 mA
Inrush Current	12 V, 1.5 A
Power Consumption	<ul style="list-style-type: none"> ■ Active Read: 12.5 W ■ Active Write: 18 W ■ Idle < 5 W ■ Max Burst: 24 W
Power Requirements	Refer to vendor product specification.

TABLE 5 Drive Physical Characteristics

Height	Width	Depth	Weight
15.0 mm +/-0.5 mm	69.85 +/-0.25 mm	100.45 mm Max	146 +/- 5 g

TABLE 6 NVMe Solid State Drive Characteristics

Attribute	Value
Minimum operating system versions	Refer to the server product notes for minimum operating system versions, hardware, firmware, and software compatibility.
Life monitoring capability	<p>Provides alerts for proactive replacement of the drive before the endurance is depleted. Provides endurance remaining in NVMe SMART logs. SSD supports the standard method defined by NVMe for Solid State Drive to report NAND wear through the “Get Log” command SMART/Health Information Percentage Used field. The units are whole percentage of wear.</p> <p>Percentage Used: Contains a vendor specific estimate of the percentage of NVM subsystem life used based on the actual usage and the manufacturer’s prediction of NVM life. A value of 100 indicates that the estimated endurance of the NVM in the NVM subsystem has been consumed, but may not indicate an NVM subsystem failure. The value is allowed to exceed 100. Percentages greater than 254 are represented as 255. This value is updated once per power-on hour (when the controller is not in a sleep state).</p> <p>Refer to the JEDEC JESD218A standard for SSD device life and endurance measurement techniques.</p>
End-to-End data-path protection	T10 DIF Type 0, Type 1, Type 2, Type 3, no performance impact. T10 DIF (data integrity field) end-to-end data protection includes multiple levels of data-path protection.
Enhanced power-loss data protection	Energy storage components complete buffered writes to the persistent flash storage in case of a sudden power loss.
Power loss protection capacitor self-test	Supports testing of the power loss capacitor. Power is monitored using SMART (Self-Monitoring, Analysis, and Reporting Technology) attribute critical warning.
Out-of-Band Management (SMBUS)	Managed through the SMBUS. Provides out-of-band management by means of SMBUS interface. This requires 3.3V auxiliary voltage. SMBUS access includes NVMe-MI, the VPD page and temperature sensor.
Hot-Plug Support	Supports PCIe presence detect and link-up detect. Device advanced power loss protection provides robust data integrity. During IOs, the storage drive integrated monitoring enables the integrity of already committed data on the media and commits acknowledged writes to the media.
Management utilities	For more information about management utilities, refer to the server documentation.

TABLE 7 LED Status Indicator Characteristics

LED	Color	Normal operation	Status
(1) Ready to Remove	Blue	OFF – The drive has not been prepared for removal. Normal operation.	STEADY ON – The drive is in standby power state. The drive can be removed safely during a hot-plug operation. A lit Ready to Remove indicator indicates that service action is allowed on the drive.
(2) Service Action Required	Amber	OFF – Normal operation.	<p>STEADY ON – Service action is required. The system has detected a fault with the drive.</p> <p>BLINKING – Locator. Status indicator blinks on and off to locate drive.</p>
(3) Power/OK/Activity	Green	STEADY ON (does not blink) – Drive is engaged and is receiving full power. Normal operation.	<p>RANDOM BLINKING – There is drive activity. Status indicator blinks on and off to indicate activity.</p> <p>OFF – Power is off, or installed drive is not recognized by the system.</p>

Product Documentation Library

Documentation for this product is available in the Oracle Help Center, located at <https://docs.oracle.com>.

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