

### Overview

## HP Z Turbo Drive Dual Pro PCIe-4x8 NVMe Carrier



### Introduction

The demands on Workstations continue to increase, especially in segments like digital media or imaging, where resolutions and file sizes are increasing. SSD technology is enabling high bandwidth at low costs/GB. The most intense workflows require greater capacity and greater performance than individual M.2 modules can offer. Combining 2 modules into a card that occupies only one PCIe x8 slot is efficient and meets the requirements for performance and capacity.

### Performance

#### HP Z Turbo Drive Dual Pro solutions

HP Z Turbo Drive Dual Pro Carrier enables up to two M.2 PCIe SSD modules to be connected to one PCIe Slot. For full performance, the card must be installed in a PCIe slot which is Gen4 speed or higher and has a width of x8 or x16. This M.2 form factor device uses a PCIe Gen4 x4 connection to each drive, which enables sequential read performance levels greater than 6GB/s for each module.

The devices can be set up with RAID for additional performance and redundancy using software RAID, or by using VROC technology from Intel.

**NOTE:** There are restrictions to using RAID with boot volumes when using software RAID. RAID volumes created by using VROC technology can be enabled for boot, provided all M.2 devices are connected to the same PCIe root port.

### Overview

#### Benefits of HP Z Turbo Drive Dual Pro

- Supports up to two PCIe M.2 SSD modules (NVMe) in one carrier, with up to 8TB storage capacity<sup>2</sup>. PCIe Gen4 x8 or PCIe Gen5 x8 slot required.<sup>3</sup>
- The active cooling solution helps ensure that the M.2 SSD modules will not throttle to low performance levels due to over-heating.
- Support for single and double sided PCIe M.2 SSDs, up to 110mm in length.
- One of the M.2 SSD modules on the card can be used as a Boot device, and the other device can be used as Data storage. Alternatively, both of the M.2 SSD modules can be used as Data devices.
- Additional storage devices, e.g. HDDs, SATA SSDs, can be used in combination with the HP Z Turbo Drive Dual Pro.
- Multiple HP Z Turbo Drive Dual Pro Carriers can be installed into HP Z Workstations.

#### Models

HP Z Turbo Drive Dual Pro PCIe-4x8 NVMe Carrier <sup>1</sup>	56Q86AA
HP Z Turbo 512GB PCIe-4x4 TLC SSD Module <sup>2</sup>	38T80AA
HP Z Turbo 512GB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module <sup>2</sup>	38T81AA
HP Z Turbo 1TB PCIe-4x4 TLC SSD Module <sup>2</sup>	38T77AA
HP Z Turbo 1TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module <sup>2</sup>	38T76AA
HP Z Turbo 2TB PCIe-4x4 TLC SSD Module <sup>2</sup>	38T75AA
HP Z Turbo 2TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module <sup>2</sup>	38T79AA
HP Z Turbo 4TB 2280 PCIe-4x4 TLC M.2 SSD Module <sup>2</sup>	5S496AA
HP Z Turbo 4TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module <sup>2</sup>	5S497AA

#### Compatibility

The HP Z Turbo Drive Dual Pro Carrier is supported on the HP Z4, Z6, Z8 and Z8 Fury G5 Workstations. It will support storage configurations as a Boot device and as a Data device. It also can be configured with other storage components including SATA drives and controllers. Not all configurations are available from the factory.

**NOTE 1:** Kit includes dual pro carrier and heatsink. Requires separate purchase of HP Z Turbo PCIe 4x4 M.2 SSD Modules.

**NOTE 2:** HP Z Turbo PCIe 4x4 M.2 SSD Modules sold separately.

**NOTE 3:** Maximum bandwidth up to PCIe Gen4 specification.

#### Recommended Slot Order

For all HP Workstation platforms the tested and approved slots for the HP Z Turbo Drive Dual Pro Carrier are as follows (in order of preference):

**Z4 G5:** Slot 4, 5

**Z6 G5:** Slot 4, 5, 6

**Z8 G5:** Slot 1, 2, 5

**Z8 Fury G5:** Slot 7, 5, 1, 6

#### Raid Support

### Overview

The HP Z Turbo Drive Dual Pro Carrier can support various RAID configurations via software RAID. Being managed by software RAID does present some differences and restrictions when compared to hardware RAID (noted below).

On Z8 Fury G5, Z8 G5, Z6 G5, and Z4 G5, both bootable and data RAID support can be configured via VROC. VROC is an Intel technology that allows NVMe devices to be configured and included in RAID arrays.

There are two versions of VROC available to customers:

- Standard – This version enables RAID 0, RAID 1, and RAID 10. RAID volumes are bootable as long as the configured devices are all on the same VMD domain (configured with the Intel VROC software).
- Premium – This version enables all RAID levels available in the Standard version and adds RAID 5.

**NOTE 1:** RAID 5 and RAID 10 configurations are only available when a VROC RAID Volume has been created containing 3 or more SSDs. These RAID levels cannot be created with a single HP Z Turbo Drive Dual Pro as it can only host up to two SSDs.

**NOTE 2:** Any RAID Volume created that contains more than one VMD domain can only be used as a DATA volume and will not be bootable.

**NOTE 3:** RAID 1 can be set up, yet will not provide complete, redundant protection as the boot partition is not replicated on both drives. An OS boot partition cannot be protected by software RAID 1.

**NOTE 4:** Limited testing has been done with Linux® to confirm RAID support and performance characteristics.

**NOTE 5:** When using more than one HP Z Turbo Drive Dual Pro Carriers in a system, please ensure that the card ID switches are set up correctly. See installation guide for complete details.

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### Service and Support

The HP Z Turbo Drive Dual Pro Carrier has a one-year Limited Warranty or the remainder of the warranty of the HP supported product in which it is installed.

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### Technical Specifications – HP Z Turbo Dual Pro Carrier

<b>Device Interface Protocol</b>	PCI Express 4.0 x4 electrical
<b>Devices Supported</b>	HP qualifies and supports certain M.2 PCIe-4x4 SSD modules to be used with this card, purchased separately.
<b>Bus Type</b>	PCIe slot
<b>BIOS</b>	Minimum BIOS required:
<b>Data Protection Features</b>	Full Power Loss Protection circuitry, including multiple onboard super caps to provide power in the event of a power loss event.
<b>Temperature - Operating</b>	Ambient: 5° to 40°C (40° to 104°F)
<b>Operating Systems Supported</b>	Genuine Windows 10 Professional 64-bit, Genuine Windows 11 64-bit, RHEL 8.6, SLED 15 SP4, Ubuntu 20.04, Ubuntu 22.04.
<b>Kit Contents</b>	HP Z Turbo Dual Pro PCIe-4x4 Carrier, full height bulkhead bracket, install guide, product notices, warranty card

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### Summary of Changes

Date of change:	Version History:		Description of change:
	From v1 to v2		

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