



## ENTERPRISE D-SERIES

# D100 PCIe Gen4 Data Center High-Speed Storage in M.2, E1.S and U.2 Form Factors

The D100 has enterprise SSD firmware optimized for data center applications that supports a high Quality of Service (QoS) in command execution completion times. Phison's business model is to customize the D100 Series SSD platform to our customers' unique application and brand requirements making the Enterprise SSD truly unique to each partner.



## Product Features

- PCIe 4.0 x4
- NVMe 1.4
- Capacity up to 3.84TB
- Form Factor: E1.S / U.2 / M.2 2280 / M.2 22110
- DWPD: 1
- 64 Namespaces
- Power Loss Protection (PLP)
- TCG Opal 2.0 Support
- AES-XTS 256-bit Encryption
- End-to-End Data Path Protection
- SECDED
- Sanitize
- NVMe-MI (Management Interface)
- SMBus

## Sequential Performance

Read 6,800 MB/s

Write 2,000K MB/s

## Random Performance

Read 900K IOPS

Write 60K IOPS

# Solution - D100P

| Form Factor                      | E1.S                               |                                    |                                    |                                    |
|----------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Capacity <sup>(1)</sup>          | 480GB                              | 960GB                              | 1920GB                             | 3840GB                             |
| Interface                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        |
| NVMe                             | 1.4                                | 1.4                                | 1.4                                | 1.4                                |
| NAND Flash                       | 3D TLC                             | 3D TLC                             | 3D TLC                             | 3D TLC                             |
| Performance <sup>(2,3,4)</sup>   |                                    |                                    |                                    |                                    |
| Sequential Read(MB/s)            | 6,500                              | 6,800                              | 6,800                              | 6,800                              |
| Sequential Write(MB/s)           | 700                                | 1,400                              | 2,000                              | 1,700                              |
| 4K Random Read(IOPS)             | 450K                               | 800K                               | 900K                               | 650K                               |
| 4K Random Write(IOPS)            | 25K                                | 50K                                | 60K                                | 70K                                |
| Read Latency (Typ., $\mu$ s)     | 75                                 | 75                                 | 75                                 | 80                                 |
| Write Latency (Typ., $\mu$ s)    | 40                                 | 30                                 | 25                                 | 25                                 |
| Power Consumption <sup>(5)</sup> |                                    |                                    |                                    |                                    |
| Active (W)                       | 9.5                                | 10.5                               | 13.5                               | 12.5                               |
| Idle (W)                         | 4                                  | 4                                  | 4.2                                | 4.2                                |
| Endurance/Reliability            |                                    |                                    |                                    |                                    |
| DWPD <sup>(6)</sup>              | 1                                  | 1                                  | 1                                  | 1                                  |
| UBER                             | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read |
| MTBF (million hours)             | 2.0                                | 2.0                                | 2.0                                | 2.0                                |
| Limited Warranty (years)         | 5                                  | 5                                  | 5                                  | 5                                  |
| Temperature                      |                                    |                                    |                                    |                                    |
| Operating Temp. (°C)             | 0 - 70                             | 0 - 70                             | 0 - 70                             | 0 - 70                             |
| Non-Operating Temp. (°C)         | -40 - 85                           | -40 - 85                           | -40 - 85                           | -40 - 85                           |
| Physical Dimension               |                                    |                                    |                                    |                                    |
| Length (mm)                      | 118.75                             | 118.75                             | 118.75                             | 118.75                             |
| Width (mm)                       | 33.75                              | 33.75                              | 33.75                              | 33.75                              |
| Height (mm)                      | 9.50                               | 9.50                               | 9.50                               | 9.50                               |
| Weight (g)                       | 63                                 | 63                                 | 68                                 | 68                                 |
| Part Number                      |                                    |                                    |                                    |                                    |
| Non-SED FW                       | D180AK02480GP015<br>12G00          | D180AK02960GP011<br>T0200          | D180AK021T92P012<br>T0400          | D180AK023T84P014<br>T0900          |
| SED FW                           | D180AK02480GP215<br>12G00          | D180AK02960GP211<br>T0200          | D180AK021T92P212<br>T0400          | D180AK023T84P214<br>T0900          |

(1) 1 TB =  $10^{12}$  bytes.

(2) Sequential Performance is based on FIO on Linux, 128K, with QD=32, 1 worker.

(3) Random Performance is based on FIO on Linux, 4K data size, QD=32, 8 worker.

(4) Latency is measured with random workloads based on FIO on Linux, 4KB data size, QD=1, 1 worker.

(5) Power consumption (Maximum RMS) is measured during the sequential read/write and random read/write operations performed by iometer with the conditions described in (2)(3).

(6) The results of DWPD are obtained in compliance with JESD219A Standards.



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# Solution - D100P

| Form Factor                      | U.2                                       |                                           |                                           |
|----------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| Capacity <sup>(1)</sup>          | 480GB                                     | 960GB                                     | 1920GB                                    |
| Interface                        | PCIe 4.0 x4                               | PCIe 4.0 x4                               | PCIe 4.0 x4                               |
| NVMe                             | 1.4                                       | 1.4                                       | 1.4                                       |
| NAND Flash                       | 3D TLC                                    | 3D TLC                                    | 3D TLC                                    |
| Performance <sup>(2,3,4)</sup>   |                                           |                                           |                                           |
| Sequential Read(MB/s)            | 6,500                                     | 6,800                                     | 6,800                                     |
| Sequential Write(MB/s)           | 700                                       | 1,400                                     | 2,000                                     |
| 4K Random Read(IOPS)             | 450K                                      | 800K                                      | 900K                                      |
| 4K Random Write(IOPS)            | 25K                                       | 50K                                       | 60K                                       |
| Read Latency (Typ., µs)          | 75                                        | 75                                        | 75                                        |
| Write Latency (Typ., µs)         | 35                                        | 20                                        | 20                                        |
| Power Consumption <sup>(5)</sup> |                                           |                                           |                                           |
| Active (W)                       | 8.7                                       | 9.3                                       | 11.3                                      |
| Idle (W)                         | 4                                         | 4                                         | 4.2                                       |
| Endurance/Reliability            |                                           |                                           |                                           |
| DWPD <sup>(6)</sup>              | 1                                         | 1                                         | 1                                         |
| UBER                             | < 1 sector per 10 <sup>17</sup> bits read | < 1 sector per 10 <sup>17</sup> bits read | < 1 sector per 10 <sup>17</sup> bits read |
| MTBF (million hours)             | 2.0                                       | 2.0                                       | 2.0                                       |
| Limited Warranty (years)         | 5                                         | 5                                         | 5                                         |
| Temperature                      |                                           |                                           |                                           |
| Operating Temp. (°C)             | 0 - 70                                    | 0 - 70                                    | 0 - 70                                    |
| Non-Operating Temp. (°C)         | -40 - 85                                  | -40 - 85                                  | -40 - 85                                  |
| Physical Dimension               |                                           |                                           |                                           |
| Length (mm)                      | 100.10                                    | 100.10                                    | 100.10                                    |
| Width (mm)                       | 69.85                                     | 69.85                                     | 69.85                                     |
| Height (mm)                      | 15.00                                     | 15.00                                     | 15.00                                     |
| Weight (g)                       | 192                                       | 195                                       | 197                                       |
| Part Number                      |                                           |                                           |                                           |
| Non-SED FW                       | D1808K02480GP025<br>12G00                 | D1808K02960GP021<br>T0200                 | D1808K021T92P022<br>T0400                 |
| SED FW                           | D1808K02480GP225<br>12G00                 | D1808K02960GP221<br>T0200                 | D1808K021T92P222<br>T0400                 |

(1) 1 TB = 10<sup>12</sup> bytes.

(2) Sequential Performance is based on FIO on Linux, 128K, with QD=32, 1 worker.

(3) Random Performance is based on FIO on Linux, 4K data size, QD=32, 8 worker.

(4) Latency is measured with random workloads based on FIO on Linux, 4KB data size, QD=1, 1 worker.

(5) Power consumption (Maximum RMS) is measured during the sequential read/write and random read/write operations performed by iometer with the conditions described in (2)(3).

(6) The results of DWPD are obtained in compliance with JESD219A Standards.



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# Solution - D100P

|                                        |                                    |                                    |                                    |
|----------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Form Factor                            | M.2 2280                           |                                    |                                    |
| Capacity <sup>(1)</sup>                | 480GB                              | 960GB                              | 1920GB                             |
| Interface                              | PCIe 4.0 x4                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        |
| NVMe                                   | 1.4                                | 1.4                                | 1.4                                |
| NAND Flash                             | 3D TLC                             | 3D TLC                             | 3D TLC                             |
| <b>Performance<sup>(2,3,4)</sup></b>   |                                    |                                    |                                    |
| Sequential Read(MB/s)                  | 6,000                              | 6,000                              | 6,000                              |
| Sequential Write(MB/s)                 | 700                                | 1,400                              | 1,800                              |
| 4K Random Read(IOPS)                   | 450K                               | 750K                               | 800K                               |
| 4K Random Write(IOPS)                  | 25K                                | 50K                                | 60K                                |
| Read Latency (Typ., $\mu$ s)           | 75                                 | 75                                 | 75                                 |
| Write Latency (Typ., $\mu$ s)          | 40                                 | 35                                 | 35                                 |
| <b>Power Consumption<sup>(5)</sup></b> |                                    |                                    |                                    |
| Active (W)                             | 7.9                                | 9.5                                | 9.8                                |
| Idle (W)                               | 3.5                                | 3.5                                | 3.5                                |
| <b>Endurance/Reliability</b>           |                                    |                                    |                                    |
| DWPD <sup>(6)</sup>                    | 1                                  | 1                                  | 1                                  |
| UBER                                   | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read |
| MTBF (million hours)                   | 2.0                                | 2.0                                | 2.0                                |
| Limited Warranty (years)               | 5                                  | 5                                  | 5                                  |
| <b>Temperature</b>                     |                                    |                                    |                                    |
| Operating Temp. ( $^{\circ}$ C)        | 0 - 70                             | 0 - 70                             | 0 - 70                             |
| Non-Operating Temp. ( $^{\circ}$ C)    | -40 - 85                           | -40 - 85                           | -40 - 85                           |
| <b>Physical Dimension</b>              |                                    |                                    |                                    |
| Length (mm)                            | 80.00                              | 80.00                              | 80.00                              |
| Width (mm)                             | 22.00                              | 22.00                              | 22.00                              |
| Height (mm)                            | 4.08                               | 4.08                               | 4.08                               |
| Weight (g)                             | 11                                 | 11                                 | 11                                 |
| <b>Part Number</b>                     |                                    |                                    |                                    |
| Non-SED FW                             | D1802K02480GP015<br>12G00          | D1802K02960GP011<br>T0200          | D1802K021T92P012<br>T0400          |
| SED FW                                 | D1802K02480GP215<br>12G00          | D1802K02960GP211<br>T0200          | D1802K021T92P212<br>T0400          |

(1) 1 TB =  $10^{12}$  bytes.

(2) Sequential Performance is based on FIO on Linux, 128K, with QD=32, 1 worker.

(3) Random Performance is based on FIO on Linux, 4K data size, QD=32, 8 worker.

(4) Latency is measured with random workloads based on FIO on Linux, 4KB data size, QD=1, 1 worker.

(5) Power consumption (Maximum RMS) is measured during the sequential read/write and random read/write operations performed by iometer with the conditions described in (2)(3).

(6) The results of DWPD are obtained in compliance with JESD219A Standards.



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# Solution - D100P

| Form Factor                      | M.2 22110                          |                                    |                                    |                                    |
|----------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Capacity <sup>(1)</sup>          | 480GB                              | 960GB                              | 1920GB                             | 3840GB                             |
| Interface                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        | PCIe 4.0 x4                        |
| NVMe                             | 1.4                                | 1.4                                | 1.4                                | 1.4                                |
| NAND Flash                       | 3D TLC                             | 3D TLC                             | 3D TLC                             | 3D TLC                             |
| Performance <sup>(2,3,4)</sup>   |                                    |                                    |                                    |                                    |
| Sequential Read(MB/s)            | 6,000                              | 6,000                              | 6,000                              | 3,700                              |
| Sequential Write(MB/s)           | 700                                | 1,400                              | 1,800                              | 1,700                              |
| 4K Random Read(IOPS)             | 450K                               | 750K                               | 800K                               | 400K                               |
| 4K Random Write(IOPS)            | 25K                                | 50K                                | 60K                                | 40K                                |
| Read Latency (Typ., $\mu$ s)     | 75                                 | 75                                 | 75                                 | 80                                 |
| Write Latency (Typ., $\mu$ s)    | 40                                 | 35                                 | 35                                 | 25                                 |
| Power Consumption <sup>(5)</sup> |                                    |                                    |                                    |                                    |
| Active (W)                       | 7.9                                | 9.5                                | 9.8                                | 10.8                               |
| Idle (W)                         | 3.5                                | 3.5                                | 3.5                                | 3.5                                |
| Endurance/Reliability            |                                    |                                    |                                    |                                    |
| DWPD <sup>(6)</sup>              | 1                                  | 1                                  | 1                                  | 1                                  |
| UBER                             | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read | < 1 sector per $10^{17}$ bits read |
| MTBF (million hours)             | 2.0                                | 2.0                                | 2.0                                | 2.0                                |
| Limited Warranty (years)         | 5                                  | 5                                  | 5                                  | 5                                  |
| Temperature                      |                                    |                                    |                                    |                                    |
| Operating Temp. (°C)             | 0 - 70                             | 0 - 70                             | 0 - 70                             | 0 - 70                             |
| Non-Operating Temp. (°C)         | -40 - 85                           | -40 - 85                           | -40 - 85                           | -40 - 85                           |
| Physical Dimension               |                                    |                                    |                                    |                                    |
| Length (mm)                      | 110.00                             | 110.00                             | 110.00                             | 110.00                             |
| Width (mm)                       | 22.00                              | 22.00                              | 22.00                              | 22.00                              |
| Height (mm)                      | 4.08                               | 4.08                               | 4.08                               | 4.08                               |
| Weight (g)                       | 13                                 | 13                                 | 13                                 | 15                                 |
| Part Number                      |                                    |                                    |                                    |                                    |
| Non-SED FW                       | D1803K02480GP015<br>12G00          | D1803K02960GP011<br>T0200          | D1803K021T92P012<br>T0400          | D1803K023T84P014<br>T0900          |
| SED FW                           | D1803K02480GP215<br>12G00          | D1803K02960GP211<br>T0200          | D1803K021T92P212<br>T0400          | D1803K023T84P214<br>T0900          |

(1) 1 TB =  $10^{12}$  bytes.

(2) Sequential Performance is based on FIO on Linux, 128K, with QD=32, 1 worker.

(3) Random Performance is based on FIO on Linux, 4K data size, QD=32, 8 worker.

(4) Latency is measured with random workloads based on FIO on Linux, 4KB data size, QD=1, 1 worker.

(5) Power consumption (Maximum RMS) is measured during the sequential read/write and random read/write operations performed by iometer with the conditions described in (2)(3).

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