

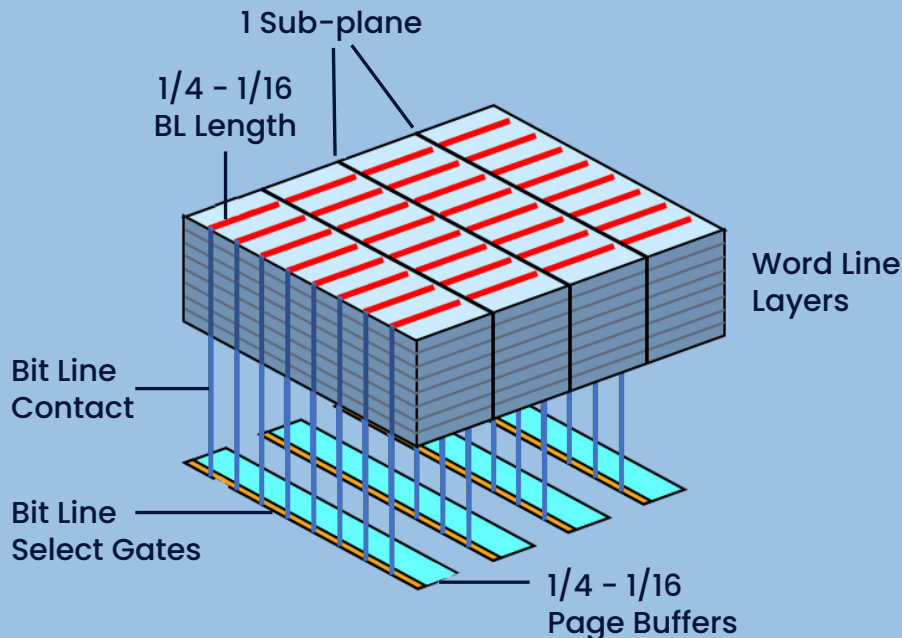


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Next Gen Memory Architectures

X-NAND™ Gen 2

Ultra High Throughput, Ultra Low Latency
Next Gen Architecture for 3D NAND Flash



Bit lines and word lines connect to cells and are used to erase, write, and read data using different voltage combinations.

Page buffers are used to optimize data throughput speeds.

Bit Line Select Gates switch Bit Lines to Page Buffers.

Each plane is divided into 4 to 16 sub-planes

3D NAND flash has already found many applications due to its high density and low price. However, read and write performance declines with each generation (e.g., TLC to QLC). NEO Semiconductor has developed a new architecture called X-NAND that is now in its second generation and delivers higher performance than conventional 3D NAND flash at:

- 20X faster sequential read and write speeds
- 3X faster random read and write speeds

X-NAND architecture can produce the high-speed and low-cost solutions required for emerging and modern applications, including AI, 5G, real-time analytics, VR/AR, and cybersecurity. X-NAND architecture supports all generations of flash memory (e.g., SLC, MLC, TLC, QLC, PLC) and the ultra-high-bandwidth flash memory integrated into System of Chip (SoC) designs.



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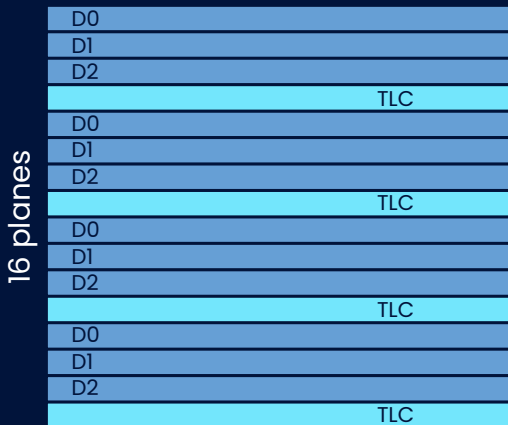
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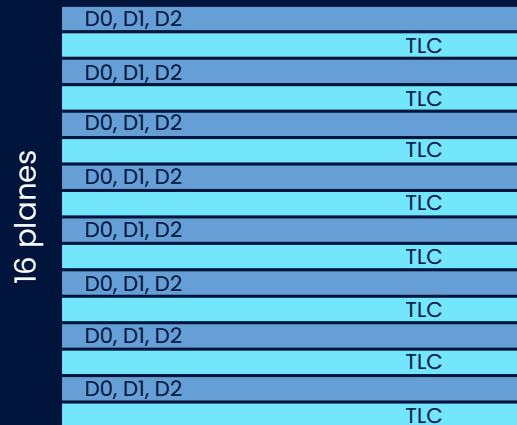
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TLC Program Throughput

X-NAND Gen1 = 1.6GB/s



X-NAND Gen2 = 3.2GB/s



10X Faster

X-NAND Gen1 delivers 10 times faster program throughput than conventional NAND flash memory at only 160 MB/s.

A total of four planes are used for SLC/TLC parallel programming. Input data is programed into three SLC word lines in 3 planes and then programmed to a TLC word line in a fourth plane.

20X Faster

X-NAND Gen2 delivers 20 times faster program throughput than conventional NAND flash memory at only 160 MB/s.

A total of two planes are used for SLC/TLC parallel programming. Input data is programed into three SLC word lines in 1 plane and then programmed to a TLC word line in a second plane.

X-NAND Gen2 Advantages

3X

Random R/W Speed

20X

Sequential R/W Speed

0%

Die Size Increase

