



# OBJECTIVE ANALYSIS

## Semiconductor Market Research

### OBJECTIVE ANALYSIS DETAILED REPORT

THE MICRON/INTEL 3D XPOINT MEMORY, 2019 UPDATE *Now Available*

#### Abstract:

This report takes a deep dive into Intel Corp.'s and Micron Technology's 3D XPoint memory and Intel's Optane and Micron's QuantX support products. We explain the technology and special challenges it has encountered in production. Following this is a discussion of how 3D XPoint memory will be used, including a section about the benefits of its persistent nature. Another section explains how the market will develop and shows how it will impact existing markets for processors, DRAM, and NAND flash SSDs. The report concludes with discussions of different market segments and predicts how the technology will impact each of them.

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Executive Summary

What Is 3D XPoint Memory?

    What is a Crosspoint Memory?

        The "Sneak Path" and Selectors

    Why Are Selectors So Challenging?

        On/Off Current

        I/V Characteristics

        Process Technologies

        Complexity

        Uniformity

    Stacking Crosspoint Decks

        Stacking's Impact on Lithography Costs

    What is the Memory Cell Made Of?

    A Brief History of PCM

How Is It Used?

    Improving the Memory/Storage Hierarchy

    How Can Optane be DDR4 Compatible?

    NVMe SSDs Also Use 3D XPoint

    Two Form Factors: NVMe & DIMM

        NVMe XPoint is Straightforward

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  - Nonvolatility for Power Fail
  - Nonvolatility for Data Resilience
  - Persistence in I/O-Bound Systems
  - Nonvolatile Memory Support Status
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- What This Means to OEMs
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