

Phison's Competitive Product Portfolio Brings More Stable Profits Over NAND Sufficiency

EXECUTIVE SUMMARY

- The rising demand from many emerging NAND storage applications has created an imbalance between NAND Flash supply and demand, and this creates NAND price fluctuations
- Phison's revenue contribution continues to grow from high-end storage products and industrial embedded applications
- The increase in the contribution of high-end storage products' revenue has shown a positive effect on the long-term revenue growth and profitability of Phison, and reduces the impact of market fluctuations on the company's profit

For a long time, NAND Flash production and supply have been accompanied by adjustments in storage application demand. However, the actual demand in storage market applications often differs from the production forecast plan to a considerable extent, resulting in NAND Flash prices being affected with price increases and decreases. This article explains why Phison Electronics (TPEX 8299) can grow steadily and thrive in the fluctuating NAND Flash market and maintain stable profits.

Global NAND Flash Market Cycle

The NAND Flash industry, like many other industries, has shown a cyclical pattern of supply and demand. When market demand rises, if there is not enough supply and a shortage happens, this will cause the price of NAND Flash to rise. The rising price of NAND Flash also means that the future demand of NAND Flash is optimistic, which promotes NAND manufacturers to increase investment and production capacity.

However, the estimated increase in production capacity often exceeds the actual rising market demand, which in turn leads to an oversupply situation, which ultimately causes the price of NAND Flash to fall. As NAND Flash prices fall, NAND manufacturers may suffer from revenue losses and declines in profits, thereby reducing investment in new production capacity. The reduced future investment will also lead to a shortage of supply when the next wave of demand for new storage applications rises. This repetitive loop phenomenon is shown in [Exhibit 1](#) below.

Global NAND Flash Market Cycle

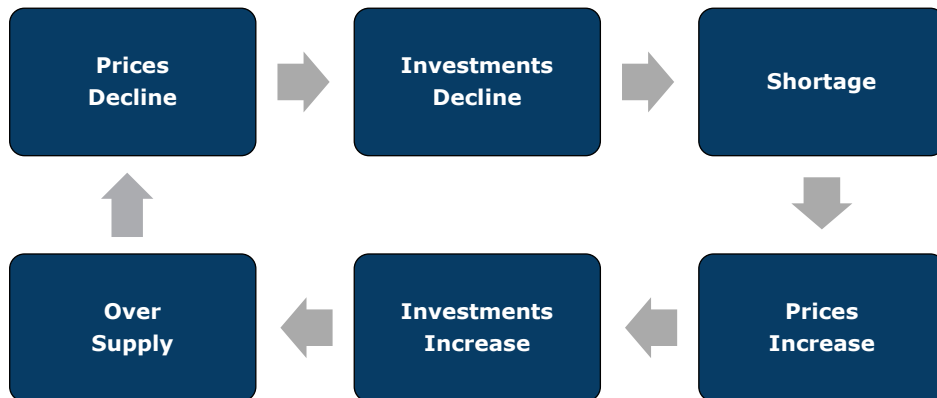


Exhibit 1: Global NAND Flash Market Cycle

Global NAND Flash Supply and Demand Sufficiency

Because of the uncertainty about future demand, the supply and demand of the NAND Flash market repetitively fluctuates, which in turn leads to changes in the price of NAND Flash.

As shown in [Exhibit 2](#) below, the dynamics of the NAND market can clearly be understood through the NAND Sufficiency Index. When supply surpasses demand, NAND prices fall, stimulating demand to rise; and when demand exceeds supply, NAND prices climb, accelerating supply to grow.

On the other hand, when the supply exceeds the demand, the price of NAND will decline. Although it will encourage the increase in demand, it will also allow the NAND manufacturers to slow down the investment of new production capacity; and when demand surpasses supply, NAND prices will rise. While this cycle promotes NAND manufacturers to invest in new production capacity, it also leads to a slowdown in demand. Demand and supply are two sides, depending on which side (consumer or manufacturer) to interpret.

Global NAND Flash Supply and Demand

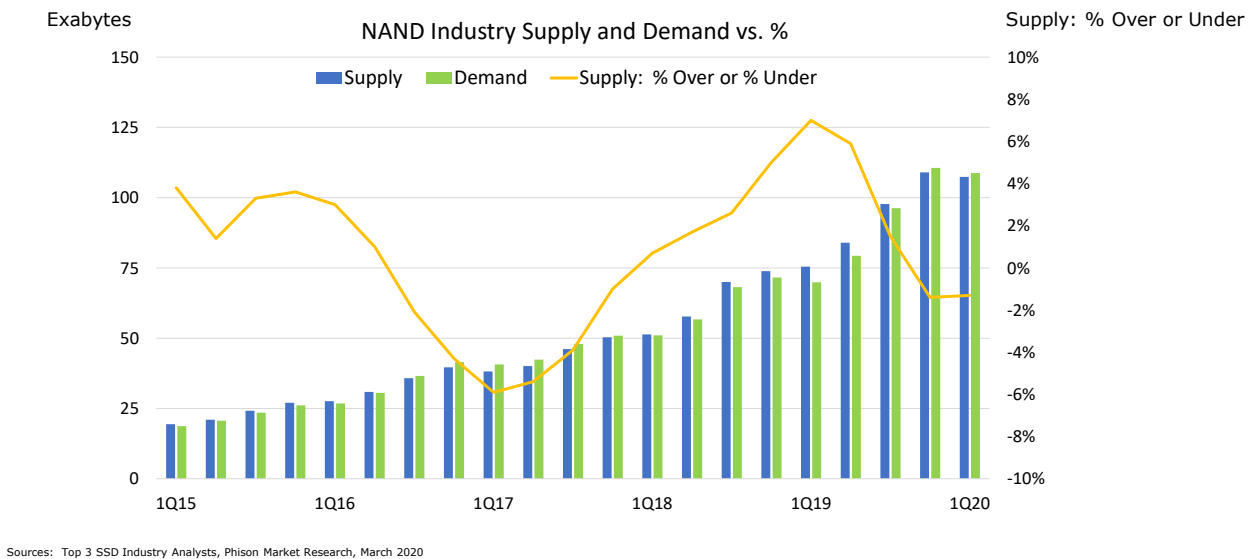


Exhibit 2: Global NAND Flash Supply and Demand Sufficiency

Phison’s Flexible Strategy Stabilizes Profits for the Long-Term

Phison’s business started from the consumer market in 2000. Since 2010, it has been deeply entrenched in the high-end storage application market, including embedded storage applications for factory automation, video surveillance systems, digital signage, POS machines, electronic medical equipment, and public transportation, etc. In recent years, Phison has been actively expanding its business into automotive electronics and enterprise-level server applications. These new applications and revenue streams have achieved significant milestones, and are positioned to contribute long-term benefits to the company’s profit and growth.

A recently published article "[Phison's Diversified Engineering Capabilities Delivers Value to Embedded NAND Customers](#)" illustrates how Phison is winning new revenue in embedded market applications. This new revenue comes from Phison’s unique business model that is coupled with strength in research and development and integration technology. Phison’s embedded market customers find more advantages partnering with Phison than competitors. Phison has gained the trust of these customers and they show it with long-term purchase order commitments. Phison supplies many NAND storage module manufacturers, and these customers also supply embedded market applications; however, for the NAND storage module manufacturers who do not partner with Phison, they are limited in their ability to provide vertically engineered products with intellectual property that is validated throughout the design process. Embedded storage application customers find out soon enough that Phison is their best partner to offer highly reliable products with customization.

As shown in [Exhibit 3](#) below, the high-end storage products and services that Phison has been cultivating for a long time have increased its revenue contribution year by year. Industrial embedded customer purchase orders provide stable, long-term design-ins with higher gross profit margins, positively influencing the future stability of Phison's revenue and profits.

Phison's Revenue Contribution of Higher-Margin Products

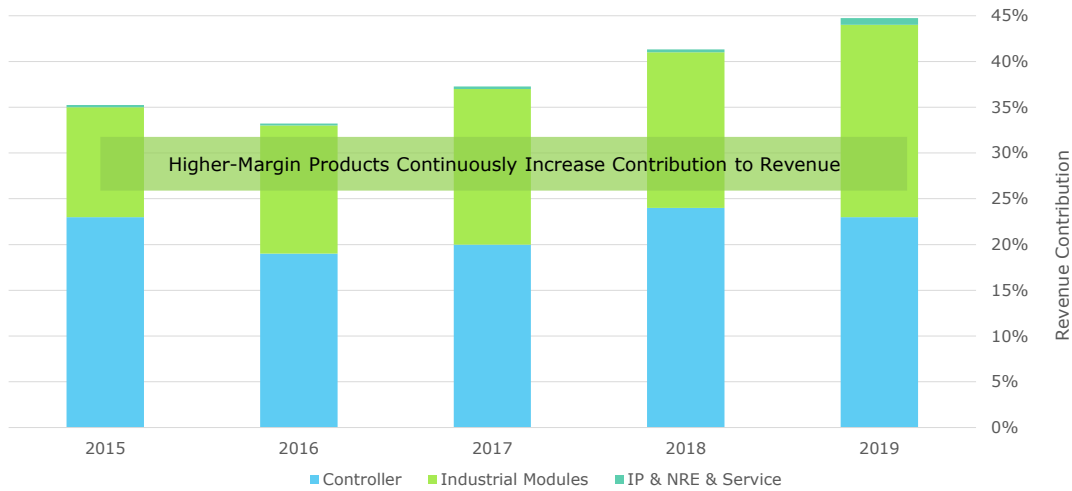


Exhibit 3: Phison's Revenue Contribution of High-End Products

Phison's Product Portfolio and Sales Tend to High-End Applications

Phison has been committed to high-end storage application markets since 2010, and the contribution of high-end products to revenue and profit has increased in recent years. Because high-end storage products require a long-term design-in verification process and continuity of supply, customers will not switch sources of supply arbitrarily due to market price fluctuations. The increase in the proportion of high-end storage products is designed to increase Phison's revenue and profit and will become more and more stable. In other words, when the market fluctuates, the impact on Phison's profits will be less and less.

As shown in [Exhibit 4](#) below, before 2017, Phison's high-end products accounted for less than 40% of the overall revenue contribution. Although the company's overall profitability remained strong and was higher than its peers, the impact of market volatility had a measurable influence on Phison's profits. However, after 2018, the contribution of Phison's high-end storage products to overall revenue exceeded 40%. It can be clearly seen from [Exhibit 4](#) that when market prices fell, Phison's profits did not decline but increased instead. This is evidence of Phison's diversified product portfolio where sales are becoming stronger, and profits are becoming more and more stable.

Phison Gross Margin vs. NAND Insufficiency

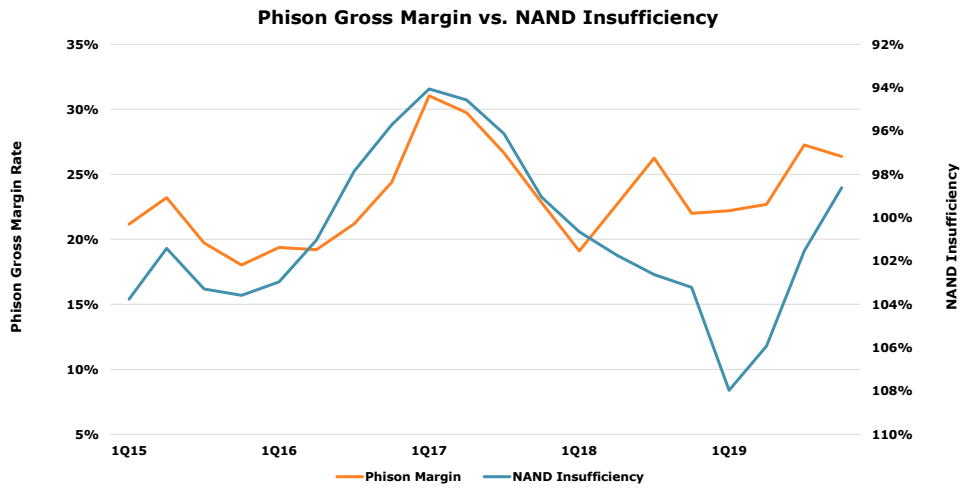


Exhibit 4: Phison’s Gross Margin Becoming More Stable due to Enhanced Product Portfolio

Conclusion

NAND prices fluctuate because of imbalances between NAND wafer manufacturing supply and demand. By continuously strengthening its product portfolio and making design-in wins into the high-end storage application markets, Phison is making its revenue and profitability more stable and resilient against NAND price fluctuations. For investors, Phison makes a long-term and stable investment with an increasing profitability contribution to a well-organized portfolio.

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PHISON FACTS

- Over 20 years of experience in NAND controller IC design and module integration
- Over 2,000 employees globally, with more than 75% in engineering
- Over 1900 memory-related patents globally
- 3 major priorities: enterprise, embedded, and consumer markets
- 600M average annual controller shipments
- \$1.45B USD sales revenue in 2019 (no debt)
- Confidence that our [unique business model](#) can produce consistently strong cashflows and profits over the long-term amidst NAND memory market cycles
- Maintain long-term partnerships with our global NAND flash suppliers and with our valued module customers

ABOUT PHISON

Phison Electronics Corp. (TPEX:8299) is a global leader in NAND Flash controller IC and storage solutions. We provide a variety of services from controller design, system integration, IP licensing to total turnkey solutions, covering applications across SSD (PCIe/SATA/PATA), eMMC, UFS, SD and USB interfaces, reaching out to consumer, industrial and enterprise markets. As an active member of industry associations, Phison is on the Board of Directors for SDA, ONFI, UFSA and a contributor for JEDEC, PCI-SIG, MIPI, NVMe and IEEE-SA.

To know more about Phison, please visit [Phison Website](#) or [Phison Q&A](#) for details.

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