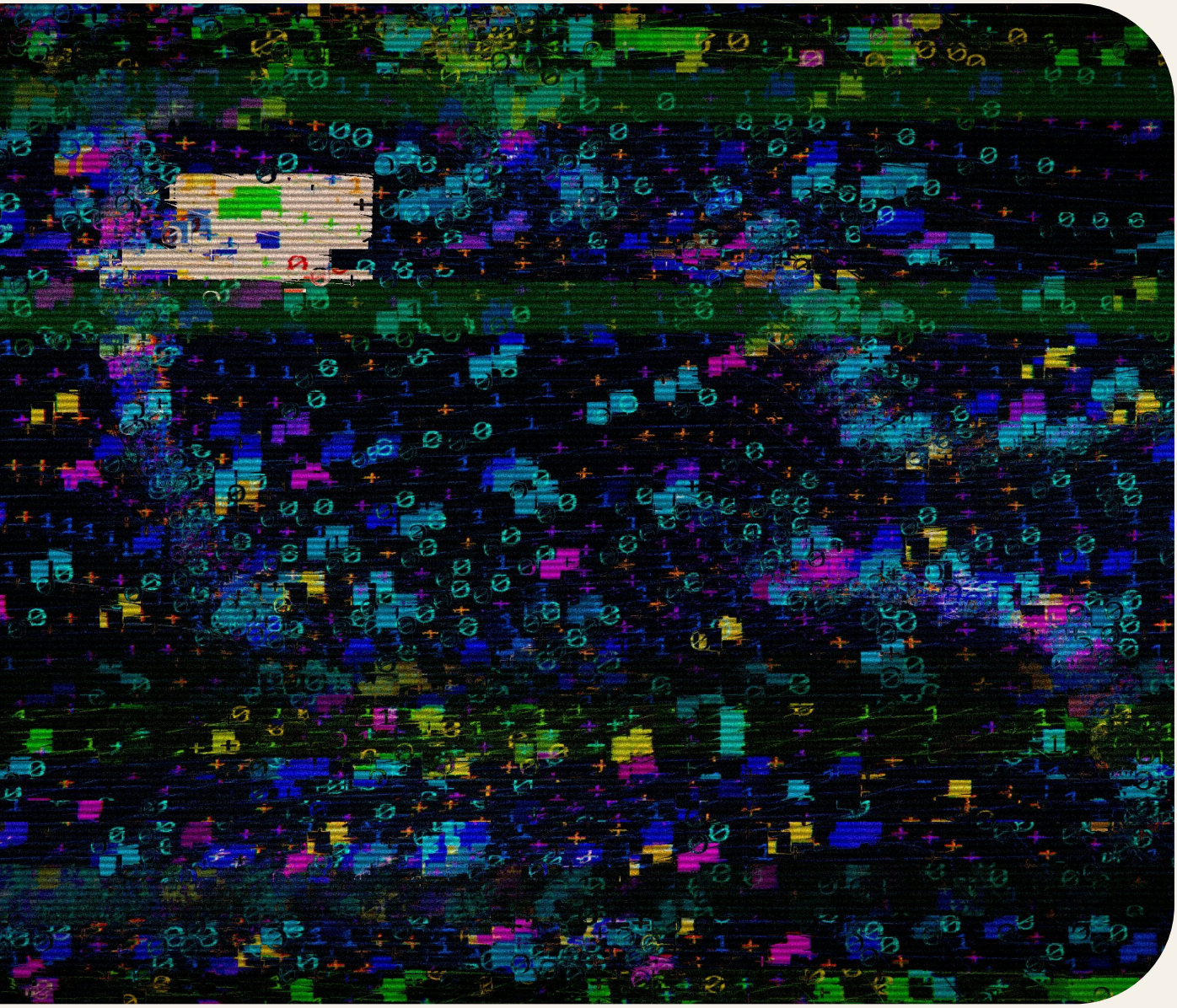

NEXTFRONTIER

SEMICONDUCTOR REPORT

Next-Gen Innovations in Semiconductor Technology

Exploring groundbreaking advancements shaping the semiconductor industry this week.

Week ending April 20, 2026

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01

In the semiconductor sector, achieving breakthroughs in chip performance is imperative as the industry increasingly focuses on optimizing efficiency, cost, and power gains.

Breakthroughs in Chip Performance (Efficiency, Cost, and Power Gains)

In the semiconductor sector, achieving breakthroughs in chip performance is imperative as the industry increasingly focuses on optimizing efficiency, cost, and power gains. Notably, innovations that enhance chip performance can lead to increased computational capabilities without a corresponding increase in power consumption. One of the crucial elements that are driving efficiency improvements in chip design is the integration of chiplets instead of monolithic chips.

Chiplets provide engineers with the flexibility to mix and match functionalities from various vendors, thus enhancing efficiency while reducing manufacturing costs. Companies like Advanced Micro Devices (AMD), which focus on chiplet architectures, are well-positioned in this scenario, but emerging mid-cap players like Babylonian Technologies, known for innovative chiplet designs, can leverage these trends toward enhanced efficiency and lower costs. Another notable contender would be Syntiant, which specializes in ultra-low power AI inference chips that can drastically reduce energy consumption while maintaining high performance for machine learning tasks.

Furthermore, the introduction of high-bandwidth memory (HBM), along with interconnect standardization through protocols like UCIe, enables better bandwidth and lowers latency, facilitating faster data transfer rates crucial for AI and machine learning applications. Mid-cap companies such as Rapid Silicon, focusing on HBM integration into their products, allow for distinct advantages over traditional memory solutions, potentially attracting high-performance computing (HPC) customers. Investors should also look at Gigaphoton, given its work with advanced photonics alongside memory architecture to promote power efficiency.

A significant trend is the rise of scalable solutions that leverage AI for real-time optimization of data movement across chip architectures. For instance, Arm Holdings, while large, still collaborates with smaller partners, making selective mid-cap companies, like Cepton Technologies, that focus on high-performance, power-efficient components, attractive investment prospects. With aerospace and defense shifting towards lower

power budgets without compromising performance, companies focusing on energy-efficient chip development can benefit greatly.

The shift towards more efficient designs will continue to become more crucial as global powers stress sustainability in tech advancements, with notable opportunities for smaller firms well-versed in energy-efficient technologies.

02

The manufacturing landscape within the semiconductor industry is in a transformative phase, reflecting significant innovations that promise improved production efficiencies, reduce...

Manufacturing Process Innovations

The manufacturing landscape within the semiconductor industry is in a transformative phase, reflecting significant innovations that promise improved production efficiencies, reduced costs, and enhanced product quality. This evolution is arguably driven by adapting to emerging designs necessitated by higher performance requirements, especially under conditions that demand faster production cycles and more customized solutions for diverse applications. Only with a keen understanding of these aspects can companies remain competitive in the challenging semiconductor market.

A focal point is the trend toward adopting advanced manufacturing processes such as 3D stacking and heterogeneous integration. This method allows multiple chiplets to be connected vertically, thereby saving board space and improving interconnect efficiency. Among small-cap companies that stand to benefit from these advancements are 8i Technology Corp, which is pioneering innovations within 3D integration technologies that enhance performance and efficiency.

Similarly, companies like Alpha and Omega Semiconductor are developing their own process innovations focusing on SiC technology layers to enhance performance for high-voltage applications, facilitating developments in electric vehicles.

Additionally, the implementation of Machine Learning (ML) and Artificial Intelligence (AI) in production workflows is paramount. The capacity for intelligent systems to analyze and optimize production processes in real-time can yield substantial improvements in yield rates and performance metrics. Easy Energy, a smaller firm, is leveraging ML algorithms for process optimization, but investors should also keep an eye on firms like Applied Materials, developing tooling capable of integrating these advanced algorithms within standard manufacturing workflows.

Moreover, the move towards automated fabrication employs smart robotics to streamline processes, reflecting innovation trends for the entire production workflow.

This evolution in manufacturing not only allows companies to reduce costs but also plays a pivotal role in addressing labor shortages by using advanced robotics. Blue-Cashew Technologies is actively engaged in creating automated fabrication solutions which reduce human reliance while ensuring high-quality standards, directly addressing the industry's growing concerns about skilled labor shortages. By pursuing these methods, small-cap companies can effectively challenge more prominent players and carve out significant market share segments.

Overall, these innovative manufacturing processes will accelerate the industry’s capacity to meet soaring global demand for chips while keeping costs manageable and maintaining quality.

03

The recent geopolitical landscape has profoundly influenced the semiconductor industry, reshaping supply chains and altering market dynamics.

Geopolitical & Supply Chain Shifts

The recent geopolitical landscape has profoundly influenced the semiconductor industry, reshaping supply chains and altering market dynamics. Notably, geopolitical tensions, like those between the U. S.

and China, led to increased scrutiny on overseas manufacturing dependencies, prompting a strategic impetus for domestic production capabilities and alternatives. In this context, companies that adapt to changing geopolitical realities will have a competitive edge, especially those prioritizing local manufacturing initiatives. Emerging mid-cap companies that align their strategies with these trends will present promising investment opportunities.

For instance, semiconductor firms that focus on domestic sourcing face escalating expectations for localized supply chains. Companies like Global Unichip Corp might find themselves in a favorable position because they emphasize chip design and manufacturing within their respective countries. As restrictions and tariffs are tightened, opportunities for local players to fill gaps left by offshore suppliers will also grow.

Additionally, foreign trade policies that favor onshoring can dramatically affect companies like Smart Modular Technologies, which primarily deliver memory solutions, as they ramp up domestic production to comply with increasing regulatory pressures.

Furthermore, firms that offer innovative solutions to alleviate supply chain bottlenecks—especially in light of the pandemic-induced scarcities—present viable opportunities for investors. Examples include <Company> which has established AI-driven platforms aimed to analyze and improve supply chain logistics, enhancing responsiveness and efficiency. These technological innovations argue for a sustained investment in capabilities across various layers of the supply chain.

Lastly, as defense and technology sectors in the U. S. ramp up investments in semiconductor technologies to reduce reliance on foreign entities, small-mid cap firms that provide innovative technologies supporting the defense industry would likely thrive.

A company like CalAmp, which focuses on communication and telematics solutions for public safety and infrastructure, clearly reflects that requisite shift in alignment with strategic governmental policies. Asset managers should mindfully consider potential players in this evolving landscape, as the focus on protective manufacturing alongside innovation will largely dictate successful trajectories in the semiconductor market going forward.

Key Insights

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- Robotics increasingly optimize production processes, addressing labor shortages.
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Dive deeper into the companies mentioned in this week's newsletter.

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