Rosefinch Research | 2023 Series # 18

Where are we in the Semi-Conductor Cycle?

On August 29, Huawei's new machine Mate 60 Pro was on pre-sale before official release. Huawei called it "the most powerful Mate phone in history", also the world's first mass-produced smart phone supporting satellite communication. Subsequently, CCTV News revealed that during the 4 years of supply interruption, Huawei has significantly increased independent research and development. Through cooperation with domestic manufacturers, Huawei achieved major breakthroughs in chips and many other technical fields. The new machine series adopts "Chinese Core", and more than 10,000 components are from domestic suppliers.

One stone can start a thousand ripples. Does Huawei's self-developed chip mark a major breakthrough in advanced process technologies for domestic semiconductors? What are the characteristics of the semiconductor industry cycle? What aspects deserve our attention now? Here are some thoughts from Rosefinch's TMT Research Team:

Q: How to evaluate Huawei's self-developed chips?

A: According to media reports, after the Canadian lab TechInsights dismantled Huawei's Mate 60 Pro's Kirin 9000s chip and analyzed it using an electron microscope, it inferred that Kirin 9000s' manufacturing process was the "N+2" process that is equivalent to 7nm.

Unlike military-grade or aerospace-grade chips, the volume of consumer-grade chips in the millions indicates a major breakthrough in the yield of domestic advanced semiconductor processes, and a qualitative improvement in large-scale production capabilities. Although there is still a gap from the most advanced international technology, this is nonetheless a major breakthrough in the large-scale commercialization of China's advanced semiconductor processes. It opens the door to a fully domestic high-end chip design and manufacturing ecosystem, which exceeded market expectations.

The introduction of Huawei's self-developed chips means that domestic advanced semiconductor processes have made further progress in large-scale production, but it does not mean that the risk of "chokepoints" has been eliminated. While we see progress, we should still remain cool-headed. On balance, this progress gives China bargaining chips in its negotiations with the United States.

Against this backdrop, views within the United States are also diversifying. China's rapid progress is evident to all. Overseas sanctions have accelerated our process of domestic substitution. Industry insiders believe that the United States "has paid too high a price for national security." In the long run, as China's industrial chain becomes more complete, China may further seize global market shares in mature processes. This is also a concern of the United States. Therefore, the United States also needs to further assess whether the costs of sanctions are worth it. A complete technological blockade in the name of national security may in the long run undermine national security.

Q: What characteristics does the semiconductor industry cycle show?

A: Generally speaking, a complete semiconductor industry cycle lasts four to six years. The current cycle's growth phase began in the second half of 2019. Under the multiple impacts of the COVID-19 pandemic, US sanctions, etc., the end users tended to order in advance and in long-terms to stock up supplies in advance, causing changes in the supply and demand relationship across the entire industrial chain and extending the business cycle.

From the second quarter of 2022 to present, the current cycle of the semiconductor industry has declined for five consecutive quarters. In addition to industry-specific cyclical fluctuations in capacity and inventory, this cycle has also exhibited new characteristics. It was interfered by macro factors such as US inflation and China's weak economic recovery, which caused overall demand to be lower than expected. This actually pushed back the turning point of the semiconductor business cycle.

This year's semiconductor industry is still in the phase of destocking, but it probably doesn't mean overcapacity. Currently, end-user inventory has reached historical average levels, but industry entities generally report that order recovery is slow because downstream demand is relatively weak and there is still no motivation to actively restock

Currently, we see that semiconductor listed companies' earnings are still declining year-on-year, but month-on-month earnings have rebounded from the bottom. The Semiconductor Industry Association

announced that global semiconductor industry sales grew 2.3% month-on-month in July, achieving four consecutive monthly growth.

Q: Which links in the industrial chain are worth paying attention to?

A: Currently, there is some overcapacity mainly in mature processes or links. The supply of advanced semiconductors is still tight for both domestic and global markets.

The market pays more attention to breakthroughs in the field of domestic semiconductor advanced manufacturing. Looking at each production links: in lithography and measurement links, we are constrained by existing conditions and there is indeed still a large gap from the world's leading technology; but in thin film deposition, advanced packaging equipment and etching processes, we may see an increase in the domestic substitution rate.

According to our research findings, across the entire industrial chain, the product coverage rate of domestic equipment in the mature process field has become relatively high. According to equipment tender data statistics, the domestication rate has increased greatly compared with 3 years ago.

Q: How to find relevant opportunities?

We pay more attention to the company's business maturity and its research and development capabilities. We aim for companies that can both benefit from the upswing of traditional semiconductor industry cycles, as well as from breakthroughs in advanced processes. In those cases, we are looking for companies that may capture key opportunities to grow from 0 to 1.

At the same time, because this semiconductor industry cycle is influenced not only by industry cyclical factors but also by US inflation and the domestic recovery process, the uncertainty of the turning point is higher, so we focus more on protecting the valuation and the margin of safety in our investments.

We hope that by sharing Rosefinch's views, we add value to your day.

We endeavor to provide timely English version of Rosefinch's publications. For any English translation of the original Chinese article, in case of any discrepancy, the Chinese version takes precedence.