

The Strategic Decision Making Analysis for a Semiconductor Company

—— *Based on SWOT Model*

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Abstract: The focus of this work is to use SWOT analysis to assess the current situation of a company and determine its strategic direction. By gaining insight into a company's internal and external environment, we can better understand its strengths and weaknesses and use this information to make effective strategies and decisions. In addition, our research also shows that while companies perform well in new product development, customer-oriented approaches, and efficient market decision-making, there are still some limitations in financial management, production control, and product diversification that need to be addressed. The innovation of this work is the application of SWOT analysis to the strategic planning of fabless semiconductor companies. While SWOT analysis has been used in various industries and fields, applying it to fabless semiconductor companies is a novel approach. The significance of our study is that it provides a practical method to evaluate a company's competitive position and guidance for its future development. The paper concludes by emphasizing the importance of leveraging strengths, addressing weaknesses, and capitalizing on opportunities to ensure competitiveness and sustainable growth.

Keywords: Semiconductor industry, Texas Instruments, SWOT analysis, strategic decision making

1. Introduction

The semiconductor industry is currently in a period of rapid development. With emerging technologies such as smartphones, consumer electronics, the Internet of things, and artificial intelligence, the demand for semiconductor chips is increasing. Semiconductor technology is also constantly innovating. A new generation of process and packaging technology is constantly introduced, which improves the chip performance and reduces power consumption. At the same time, the rapid development of emerging technologies such as artificial intelligence and cloud computing has also put forward higher demands and challenges for the semiconductor industry. However, the semiconductor industry also faces some challenges. On the one hand, the global semiconductor market is highly competitive, especially with competitors from the United States, South Korea, Japan, and other countries. On the other hand, the supply chain problems in the semiconductor industry

chain and the unstable supply of raw materials also bring some pressure to the development of the industry.

Our research object is Company A, so this paper will take Company B as A reference to focus on analyzing the operating conditions of Company A. The following is a brief introduction to the company. Company A: This case study object. A Chinese fabless semiconductor company. Engaged in power management integrated circuit design, sales, and technical service business. The company was founded in 2010 and is headquartered in Shenzhen, China. The R&D center is located in Suzhou, China. The total number of employees is about 100. The annual turnover is about 200 million yuan (about 27.7 million US dollars). B Company: TI (Texas Instruments). Reference object of this case study. An American semiconductor company. Engaged in analog and digital processing rich categories of integrated circuit design, manufacturing, sales, and technical services business. The company belongs to the integrated design and manufacture (IDM) type semiconductor company. The company was founded in 1930 and is headquartered in Texas, USA. It has R&D and manufacturing centers in many places around the world. Approximately 33,000 employees worldwide. Annual turnover is about \$2 billion.

The SWOT model was used in comparison with Company b. This essay will provide an overview of the importance of strategic decision-making and the role of SWOT analysis in evaluating a company's internal and external environment. It introduces Company A as the subject of analysis, highlighting its focus on AC/DC power management integrated circuits and its position in the Chinese semiconductor industry. The analysis also mentions the comparison with Company B, a leading semiconductor company, to identify areas of improvement for Company A.

2. Literature Review

Our research first relates to the product aspect of semiconductors. Yi Zhang and D. Brian Ma note that as people use increasingly complex electronic devices, including some computers and mobile phones, the demand for chips that help power electronic products continues to rise, which means that the demand for highly efficient power management devices has soared. The original technology, however, was clunky and not fully adaptive enough to switch power sources. Therefore, a new control technology is needed to overcome these shortcomings [1]. Shoubhik Gupta and other authors cited advances in flexible electronics but said there were still shortcomings. Because of the nature of silicon itself, the production of ultra-thin chips is difficult. So, they try to solve or improve this situation by analyzing the physical properties of the material itself, as well as modeling and packaging techniques [2]. Myny describes the potential of thin film transistor technology and what areas it will help enable or advance. Myny also evaluated the impact of this technology on integrated circuit design [3]. Bernd Hoefflinger details the entire process of how to deal with transistors and the current difficulties and limitations of the global semiconductor industry and tries to find solutions [4].

Our research is also relevant on a technical level. Thomas tells us what semiconductor materials are currently used to make integrated circuits. He pointed out that there are still certain challenges if people want to use germanium to make integrated circuits [5]. El-Damak, Dina Reda, write about the benefits of power management circuits for various electronic devices, especially low-power devices such as wearables [6]. Chengdi Xiao and co-authors present a technique that already improves the performance of electronic devices and has great potential for development. But it also raises a number of issues, including thermal management challenges for devices with multiple chips. In this paper, the authors propose a method that can quickly and accurately estimate thermal conductivity, providing an effective method for the IC industry [7]. Fischer and six other authors show that most microelectromechanical system (MEMS) devices must be used in conjunction with integrated circuits (ICS) and that there are certain limitations to how the system operates. So, in this paper, they review

both traditional and innovative integration approaches to help solve how to achieve multi-chip hybrid integration [8].

3. Analysis

I will use SWOT to evaluate the current situation of Company A and make corresponding strategies and decisions. The SWOT model is a concise tool that can help internal members and external stakeholders understand the current situation and direction of the company. Using the SWOT model, the company's strategies and decisions can be better communicated and communicated. This will help the company to determine its competitive advantages and formulate corresponding strategies. This helps the company to remain competitive and sustainable in the market. The SWOT model provides a comprehensive analytical framework that can help a company gain a comprehensive understanding of its internal and external environment.

Firstly, through a simple comparison between Company A and Company B, it can be concluded that the two companies mainly have the following differences:

Company A has strong competitiveness in new product development and corporate culture, especially in new product development with core competitive advantages and capabilities. Limited by the small scale of the company, Company A has weak control ability in financial management. At the same time, because all production is outsourced to upstream suppliers, Company A is particularly weak in the production control and depends on increasing product shipments and sales scale to obtain better bargaining power and production influence ability. Market decision-making ability and organizational management ability can effectively perceive market changes to formulate the right development direction for the company. Because of long-term adherence to the development of its own packaging, it better strengthens the stickiness of customer use. The vitality of the product is relatively long and strong, and it has become one of the core competencies of the enterprise.

Company B is in a leading position in our industry, so the shortcomings of Company A can be found by comparing Company A with Company B first. However, due to the differences in the business basis of Company A, the business model of Company B cannot be completely copied. Therefore, a more specific environmental analysis is needed for Company A. Next, I will conduct an environmental analysis of Company A through a SWOT model.

I will conduct a SWOT analysis on Company A. First, the internal environment analysis. Let's first analyze the advantages of Company A. The first point is that Company A mainly focuses on AC/DC class switching power supply control integrated circuit products. Strong product correlation can be more targeted to meet the needs of users. Provide users with optimized application matching. The comprehensive cost performance can be optimized to the maximum. The products have good competitiveness. Secondly, Company A's business promotion and service are timely and in-depth. Because Company A mainly deals with Chinese manufacturers. Can provide customers with localized services. Service response is fast and timely. It is easier to obtain customer recognition and maintain good user satisfaction. Third, customers demand transformation speed. For the new needs of customers, we can provide quick decisions and the project approval to develop the new solutions and products that customers need most. Effectively improve the speed of new products to market.

In terms of weakness, Company A has three major weaknesses in terms of company size, research and development level, and product level. The first is the company's small size. The resource capacity is weak. Weak bargaining power with upstream suppliers. The product processing cost is relatively high. It easily leads to the erosion of profits and the decline of profitability. Then, its research and development investment are small, resulting in fewer research and development projects, and it can not well meet all the development needs of users. Resulting in the loss of potential projects, reducing the ability to provide future products. The research and development capacity are weak, and the demand for high requirements has insufficient technical capacity. Causes problems that may not lead

to successful R&D or excessively long R&D cycles. At the same time, insufficient research and development capabilities limit the ability of products to cover multiple related needs. Resulting in a smaller product scale. Indirectly, the cost of the product is increased, and the scale effect is reduced. Finally, the product category of Company A is small, and the market is relatively single. Customer scalability requirements may not be met. Unable to provide customers with a complete overall solution. As a result, customers still need to use a third-party integrated circuit (IC) to complete the design. Therefore, it is easy to cause a customer loss and reduce customer stickiness.

Then, the external environment analysis. There are three main opportunities for company A. The first is the increase in global demand. As China further accelerates the construction of the Belt and Road. There is an obvious trend of expanding the product sales area. The opportunity to spread from the Chinese market to the global market has greatly increased. As seen from China's Belt and Road network, as of June 2023, China has signed more than 200 cooperation documents on Belt and Road cooperation with 152 countries and 32 international organizations [9]. According to the China Free Trade Zone Service Website of the Ministry of Commerce of the People's Republic of China, China has signed 19 free trade agreements with 26 countries and regions [10]. Potential demand has greatly increased. The second opportunity is for extreme weather to improve energy efficiency standards. With the intensification of global warming and the frequency of extreme weather. People pay more and more attention to the protection and repair of the environment. Low carbon has become an increasingly desirable living habit. Among them, green energy occupies a certain position in the industry, and the requirements of energy efficiency indicators in various countries are becoming increasingly strict. Energy efficiency regulations are increasing year by year. Power conversion plays an important role in secondary energy conversion and utilization. The requirements for power conversion efficiency are getting higher and higher, and the standby power requirements are getting lower and lower, thus promoting the continuous progress of power control products. Therefore, more innovation needs have been generated, which has accelerated the relevant market update iteration and generated new demands. Secondly, the development of a new energy industry also brings huge opportunities to Company A. The development of green energy is conducive to the centralized green treatment of pollution. This has effectively promoted the development of the new energy industry represented by electric vehicles. According to the International Energy Agency, the global installed capacity of new energy is expected to reach 68 gigawatts by 2030, equivalent to more than twice the global power system today. According to the requirements of the "New Energy Development Plan" adopted by The State Council of China, the proportion of new energy vehicles in the public sector will be no less than 80% by 2021. Countries have also introduced plans to ban the sale of fuel vehicles. The development of the new energy industry is bound to greatly promote the electronic process of traditional automobiles, which will produce a huge demand for new power control products and technologies.

The first threat is uncertainty over the pattern of global trade. With the further development of the trade dispute between China and the United States, the risk of anti-globalization is greatly increased, and world trade faces great downside risks. It may cause uncertainties and changes to the pattern of Chinese enterprises in the global supply chain. This may have some impact on Chinese companies, thus reducing market demand. Second, changes in the Chinese market caused by force majeure factors will also bring certain threats. During the three years of COVID-19, the global supply structure has taken a big hit. Lead to the open allocation of the world industrial division of labor has a great question. It further aggravates the risk of industrial loss in China, leading to a decline in demand dependent on the Chinese market.

Management suggestions for Company A: According to the above analysis of the internal and external environment of the enterprise, we find that the product richness of Company A is low. Therefore, we believe that enterprises should choose the WO strategy. To execute this strategy, the

company should take advantage of its external opportunities and avoid internal disadvantages. Specifically, companies can refer to the following recommendations. First, thanks to the long-term strategy of actively promoting its packaging form. The stickiness of the company's products on the client side is high. In the future, we should still rely on our own packaging types to develop more products and actively improve the number of product categories to expand product coverage. Meet more needs of customers. Make customers more concentrated and make more use of the company's products. Secondly, Company A should actively explore the overall product requirements under customer application scenarios and fill in the missing areas of development accordingly. Thus, it can provide customers with products based on total solutions. So that customers do not need to look for third-party products as a match. Therefore, improve customer experience, increase customer retention, and reduce the risk of customer churn. Under the premise of their own can bear, timely development of some lightweight new energy field products. Make certain layout and preparation for entering the huge new energy market in the future. Lay a good foundation for long-term development. Finally, follow the market. Establish a business presence in the appropriate country. Reduce regional economic risks under the changing pattern of world trade and ensure a sound foundation for development.

4. Conclusion

In conclusion, we can summarize the findings of the SWOT analysis and emphasize the need for Company A to leverage its strengths in product development and customer service while addressing weaknesses in financial management and the production control. The conclusion also highlights the opportunities presented by global demand expansion, increasing energy efficiency standards, and the development of the renewable energy industry. It encourages Company A to formulate strategies that capitalize on these opportunities and mitigate potential threats, ultimately ensuring long-term competitiveness and growth.

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