by Brian Rosenbloom

Patents: Prudent Investment With Future Potential or Inefficient Capital Allocation?

One of the RAP sessions at the IEEE Applied Electronics Conference and Exposition (APEC) 2024, in Long Beach, CA, USA, debated the value of seeking patent protection for innovations and product improvements. This RAP session was a great success, sparking much debate and thoughtful discussion, if I do say so myself. I chaired the RAP session, and had an excellent panel to keep the discussion lively and interesting (many thanks to Grant Pitel, Patrick Chapman, Jeewika Ranaweera, and Prof. Johann W. Kolar for participating on the panel).

When asked whether I would be interested in chairing such a debate, I was honoured and jumped at the chance. I was equally honoured when asked whether I would like to be a contributor to the magazine's "Patent Reviews" column.

A quick introduction—I am a patent attorney with over 25 years of experience guiding inventors and companies, large and small, through the patent process. In addition to my law degree, I have an undergraduate degree in electrical engineering from Columbia University and I worked for General Electric for four years before heading to law school. I gained my first exposure to power electronics when my father and our next-door neighbour started a company making induction heating systems, including radio frequency (RF) power supplies. I guided the company, now known as Ambrell, through the patent process many times, obtaining patents on everything from unique coil designs to a high frequency power amplifier to a consumer kitchen appliance for heating cans of coffee using induction.

The question of whether or not to seek patent protection is a question I deal with on a daily basis. And, if you attended the APEC RAP session, you would know the answer to this question, which, as any good lawyer would tell you, is: "*it depends*." But what does it depend on? Read on to find out.

To decide whether or not to seek patent protection, you should first understand exactly what is patent protection. A patent on a product gives you the right to *stop others* from making, using, and selling the patented product, or, at a minimum, the right to obtain a reasonable royalty from someone who makes, uses, or sells a product covered by your patent.

Getting a patent on one of your products, however, does not necessarily mean that you have the right to sell the product. It is possible that the product you have developed includes a component patented by another. In such a case, to avoid patent infringement by making or selling your product, you would need a license (express or implied) to the other patent. To reduce this risk, it may be advisable to perform a "Freedom to Operate" patent search before investing heavily in the development of a new product. More on Freedom to Operate searches in another column.

How is the right to "stop others" valuable? Great question. The right to stop others creates a valuable *barrier to entry* in the marketplace. Without patent protection, a would-be competitor might simply copy your product and compete for your customers. Also, if you are a start-up seeking investors and do not have patent protection in place, you may have difficulty attracting investors; many investors are not willing to take the risk that a would-be competitor could simply copy your product and steal market share. If you are an avid Shark Tank watcher, you know that the Sharks routinely ask the entrepreneurs "do you have a patent?" No Shark wants to invest in a company if there is a high risk of others using the idea to create knockoffs.

Does this mean you should always apply for a patent when bringing a new product to the marketplace? The answer is: "no," for several reasons. First, to obtain a patent on a new product, the product not only must be unique in some way compared to what already exists, but also must be non-obvious. If the differences between your product and an existing

Digital Object Identifier 10.1109/MPEL.2024.3391590
Date of publication: 26 June 2024

product seem obvious, it may not be worth the time and/or money needed to apply for a patent. For example, if the difference between your product and the existing product is a foreseeable, common-sense difference, it may not be a wise investment to seek patent protection. The hard part can be distinguishing the obvious from the non-obvious.

Second, if it would be extremely difficult for a competitor to create a *competitive* knock-off, then you may not need patent protection. For instance, you may have "know-how" that no one else possesses and without this know-how it would be extremely difficult for a competitor to create a competitive knock-off. If you take this route, however, you should protect this "know-how," i.e., you need to keep it secret.

These are just some of the considerations you need to keep in mind when deciding whether or not to spend valuable time and money seeking patent protection.

If you decide that patent protection is the way to go, then do not delay. It is important to get your patent application on file with the patent office as soon as possible because you do not want a competitor to file before you. Also, it is typically a best practice to file your patent application *before* you make *any* public disclosure of your invention, including showing a prototype at a tradeshow or offering for sale a product embodying the invention, otherwise you risk losing the right to obtain a patent on the invention.

The APEC RAP session explored these issues from several different angles, and here were the takeaways: 1) there are some situations where there is no question that seeking patent protection is a prudent investment; 2) there are other situations where seeking patent protection is not prudent; and 3) there is a vast middle ground where the answer is not black-and-white, it depends.

This article is for general information purposes and is not intended to be and should not be taken as legal advice.

About the Author

Brian Rosenbloom (brosenbloom@rothwellfigg.com) received the bachelor's degree (cum laude) in electrical engineering from Columbia University. After his bachelor's degree, he was a Software Engineer at General Electric for several years. He attended the Law School at Georgetown University. He is currently a Shareholder with the law firm of Rothwell, Figg, Washington, DC, USA. He is an Expert in intellectual property (IP) counselling, patent prosecution, and patent litigation proceedings before the U.S. Patent and Trademark Office (USPTO). He counsels a broad range of clients, from Fortune 100 companies to independent inventors, entrepreneurs, and emerging enterprises. He has over two decades of experience in the IP field and a strong technical background in the electrical arts. He was a member of the Engineering Honour Society, Tau Beta Pi, and the Electrical Engineering Honour Society, Eta Kappa Nu.

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Expert View

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Having a more complex crystal structure, SiC wafers have four orders of magnitude more defects compared to comparably sized Si wafers. To SiC's advantage, their smaller die sizes have less chances of an extrinsic defect. However, yields are still far lower for SiC than Si devices. Today, SiC wafer production is mainly 150-mm but on the cusp of making the transition to 200-mm wafers.

In contrast, since GaN uses Si as a starting material, there is a much clearer path for GaN to achieve 300-mm wafers. By the end of this decade, GaN should transition to 300-mm wafer production.

Because Infineon understands where these transition points will occur, it is investing appropriately in manufacturing facilities around the world. While a new 300-mm Si wafer fab has gone into production in September 2021 in Austria, a new facility in Dresden, Germany is planned to go into production in 2026 and become the third 300-mm Si wafer fab for power devices. At the same time, Infineon is constructing the world's largest WBG wafer fab in Malaysia, focusing on both SiC and GaN device manufacturing.

Silicon Power—Still Going Strong

All of today's communications, computing, convenience, comfort, energy conversion, and transportation products require power semiconductors to function. While SiC and GaN will benefit from many new applications, Si power devices will continue to be effective in many new applications as well as in already established markets. In short, Si power is not going away. It is well established and will serve a variety of markets for the foreseeable future. To paraphrase Mark Twain, any reports of Si power's demise are greatly exaggerated.

About the Author

Michael Williams (Michael.Williams@infineon.com) received the M.S.E.E. degree. He is currently the Director of marketing for industrial and infrastructure at Infineon Technologies. He has 18 years of experience in the component market focused on power and switching technologies.

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