

DIALOG: With Patrizio Vinciarelli, CEO of Vicor

There is not likely to be any slowing down in our hunger for more and more power to help us do our jobs and lead the lifestyles we want to lead, and we are rapidly reaching an inflexion point where the current technology simply won't be enough. Vicor is looking to carry on its success within the brick space into new areas that will allow supply to keep up with demand. The company's CEO, Patrizio Vinciarelli, talks with *EPN's* Mike Green.

Electronics designs, whether in the telecom, consumer, or industrial sector, all put great demands on power-supply vendors to provide them with the means to fit more power into smaller spaces, while producing less heat and costing fewer bucks. How are companies like Vicor managing to cope with these challenges?

Patrizio Vinciarelli: We are focused on increasing power density, efficiency and other key converter figures of merit, and we are finding new ways to continue to do so through technological advances. This spans the range from silicon to magnetic elements and innovative power topologies. Almost 20% of the company's employees are in R&D, and we invest over 15% of revenues.

Can the increases in efficiency and power density that we have seen in DC/DC converters continue at this high rate? Surely we are reaching a point where there will be physical limitations on what can be done, and if so, won't that make it harder to differentiate yourselves from the competition?

P.V.: There is still continuing room for improvement. With our V•I Chip building blocks we now offer up to 97% efficiency, providing DC/DC converter functionality that reaches levels up to 94%. I don't believe there is a ceiling below 100%. Mother Nature did not set a limit at 94%. We continue to overcome the limitations of old topologies and components. I see inefficiency - the heat per unit of output power - being cut in half every ten years.

The DC/DC converter space is still overcrowded. Do you see any likelihood of further consolidation here?

P.V.: Fundamentally the power-conversion market is overcrowded and being commoditised by lack of innovation. Too many players are following a trend rather than differentiating themselves by developing innovative solutions. The phenomenon of brick vendors catering to the growing telecom market in the 1990s exemplifies the "sheep syndrome" that is so characteristic of the power industry. This is not a business model that is viable in the long term. Consolidation is the next step for an industry that, lacking fundamental innovation, is unable to deliver value or competitive advantages to customers.

At the same time, competition must be leading to greater price erosion. By trying to be an innovation-led supplier rather than going for the high-volume, commoditised markets, has Vicor managed to maintain reasonable margins?

P.V.: Yes, we've recovered from the burst of the telecom bubble and have actually been improving our margins; but the assumption that we would not target volume markets in the future is mistaken. Whereas most players are enamoured with the telecom and IT space, thanks to our innovative products we are developing opportunities in other larger markets, like automotive and consumer.



P.V.: I cannot disclose information about our customers. However, I can tell you that, for example, in the consumer-electronics space, Sony has entered into a V•I Chip license agreement and that, in the IT space, IBM has gone public with some of the benefits of V•I Chips.

Your Factorised Power Architecture (FPA), which utilises V•I Chips, puts voltage transformation at the point-of-load, while regulation is done further back, saving space and solving outstanding power-design issues. However, can this kind of off-the-shelf, modular solution offer the same levels of performance as semi-custom offerings available from your rivals?

P.V.: Advanced power components are the future. A methodology leveraging appropriate power components offers advantages in terms of higher density and efficiency, faster time-to-market with greater predictability, reduced development costs and greater economies of scale. What's needed to enable a power-component revolution is efficient power distribution, as provided by Factorised Power, and building blocks with the right attributes of performance, granularity and cost-effectiveness: V•I Chips. The brick concept that Vicor pioneered in the 1980s was the first wave. It had limited applicability and reach. Factorised Power and V•I Chips have the attributes to deliver high performance, flexibility, and cost-effectiveness. And that's why the days of custom power supplies that are designed from the ground up are numbered. Much like engineers have stopped designing amplifiers with discrete components and, instead, go to the website of an analogue supplier and buy a cost-effective chip, they'll stop designing power supplies. That's the potential of V•I Chips.

With other players in the market standardising formats and collaborating to form alliances like DOSA and POLA, are they effectively levelling the playing field for their competition and leaving themselves open to having business stolen from them? Or will it mean that the firms who are not supporting them get left out in the cold?

P.V.: The DOSA and POLA standardisation is based on antiquated technology and is not the foundation of a viable business model: it's an invitation to a "rat race" based on misplaced priorities. Industry standardisation must be predicated on power-technology platforms that support efficient power processing and power management and which enable superior electronic products.

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- Vital Statistics: **Vicor**
- Headquarters: **Andover, MA, USA**
- Established: **1981**
- CEO: **Patrizio Vinciarelli**
- Employees: **1,100**
- Business: **Power-Supply Solutions**
- Revenue: **\$180 million (CY2005)**

V•I Chip products have gained a lot of media attention since they were introduced two years ago. Have they now started to see adoption in OEM designs, and how have you gone about changing engineers' mindsets to allow this?

P.V.: We initially worked with a few large OEMs in key end markets. Because of the disruptive nature of V•I Chips, we decided that it was best to focus on applications with blue-chip OEMs first. Now we are beginning to broaden this market focus, and we expect to engage customers across a diverse spectrum of applications and industries.

Can you mention some of the companies, and applications, that are now making use of this technology?