

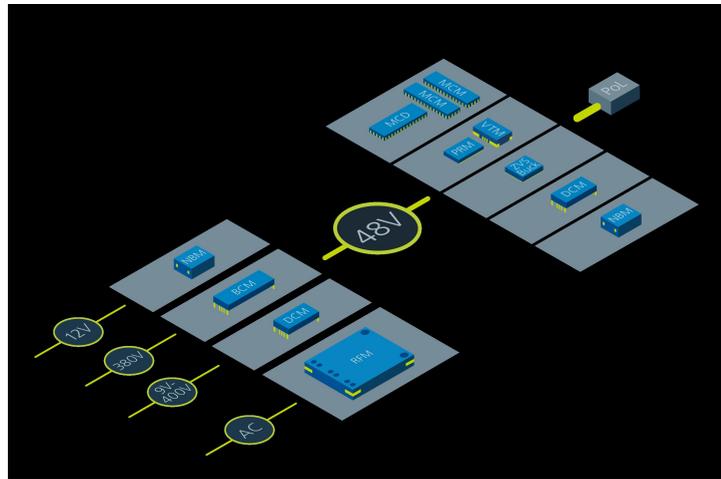
## When Less is More

Author: Ally Winning, European Editor, PSD  
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Balancing performance, size and cost is always a challenge for designers of any electronic component. For power products, it is no different. As end products get smaller, the demands on designers of power circuits get tougher and tougher. Designs have to fit into miniscule spaces, while still being hyper efficient and costing very little. It's a barely possible task that often requires creating a completely new power design for every new product. Manufacturers of power components are trying to keep up



by offering smaller and more efficient modules that will assist designers, but that can come at a cost – both from using the latest technology and making so many product variants that getting the full benefits of large scale manufacturing is not really possible. The speed of innovation is not slowing, and new, complex challenges have emerged in datacentres, wearables, lighting and automotive applications that leave power component manufacturers struggling to provide solutions for every scenario.

One company stepped back to see if there was a different way to tackle the challenges that were emerging. From that process, Vicor decided to make fundamental changes to the way that the company operates. Firstly, it looked at the whole power distribution network and developed an overarching strategy for product design. The strategy is based on using a 48V middle step between the input voltage and point-of-load for the greatest efficiency – no matter if that voltage is from the mains or 12V DC. The modules themselves would use a single conversion topology that Vicor has worked on over the last four years. It is based on the company's 0V/0I soft-switching for efficient conversion that minimises losses. Those conversion elements are then combined on a panel depending on voltage requirements of the final module. The panels are then set in a 3D package with supporting components for more efficient cooling. The company already uses this technique in its latest products to give what it claims is the industry-leading power density of 610W/cm<sup>3</sup>. By standardising on this single element, Vicor can use the same production lines for any product, getting greater economies of scale and keep costs down.

The resulting products will provide power designers with small modules that are highly efficient and very cost-effective. Because they combine the three desired traits of efficiency, size and cost, designers won't be forced to compromise, and fewer product variations will be required. This, in turn, will further decrease engineering costs and allow power designs to be easily repurposed for other products.

Vicor is so confident in its new strategy that it has implemented a target of tripling the company's revenue, and

is making major investments to significantly increase its manufacturing capacity. Those plans include an 85,000 square foot extension at its current manufacturing facility that is due to be completed in the third quarter of next year. It is a bold strategy that attempts to reverse the trend of more and more product variations. The future will tell if it is the right one.

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