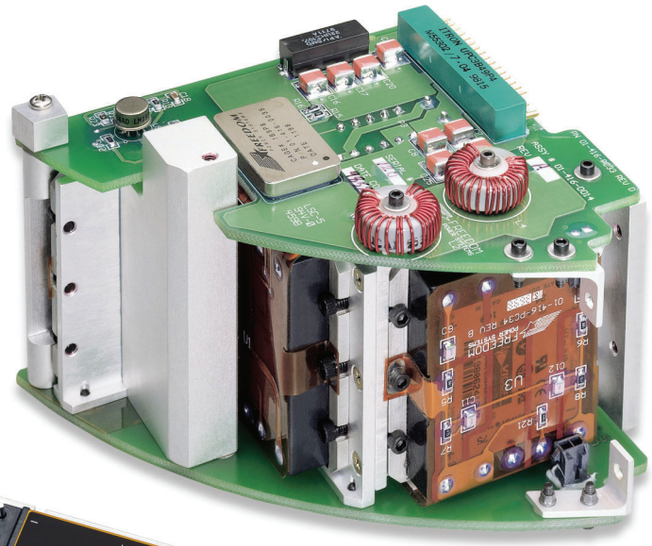
Why compromise on design when you can customise?



Custom power supplies: What are they, why are they needed, and what are the choices? **Andy Gales**, senior director of international sales at Vicor, explains...

Most OEM power system requirements have been met by custom power supplies. A custom power supply is, by definition, a one-of-a-kind power solution, traditionally designed and built from scratch using discrete components to serve a specific application. Moreover, the design can truly be optimized for the specific application, designing in only what's needed and nothing more. Such designs require a substantial amount of development time and up-front expenses, but in spite of its high initial expense, such an approach is usually easy to justify when high quantities are involved, because those high initial expenses can be amortized over many units.

Why customise?

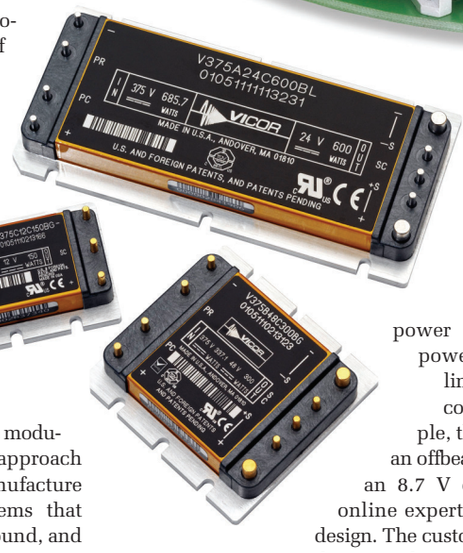
No designer wants to compromise the size, shape, or functionality of his or her primary product design. The power system needs of electronic OEMs, for example, have been, and will continue to be, unique. Systems need different combinations of voltages, currents, and features to be supplied from a variety of input sources.

Fundamentally, power designers who turn to a custom power supply want the specific inputs and outputs they need configured to fit their applications. Although this desire for a conventional custom system still exists, many power system architects have neither the time to wait nor the volume over which to amortize the non-recurring expense of a custom system. What's more, they often need other attributes such as quick time to market, low risk, high system availability, and cost effective life cycle.

What are the choices?

Today, the traditional approach to designing and developing a custom power solution is still prevalent. However, engineering design resources are becoming increasingly scarce, expensive, and specialized, which is making this approach less attractive every day. In the end, traditional custom power solutions will not be economically viable in this age of fast time to market, lower prices, high availability, and high reliability.

Fortunately, other forms of custom power are becoming available that provide all of the benefits of a custom power supply and then some. In recent years, custom power manufacturers using component power in a modular, building-block design approach emerged to design and manufacture turnkey custom power systems that offered low cost, quick turnaround, and reliable performance.



Although power components were available in a broad range of input voltages, output voltages, power ratings, package sizes and feature sets, the choices were finite. Power engineers were constrained by manufacturer distinctions between "standard" and "custom" power component specifications. A legitimate custom power component product carried the same penalties and risks as the traditional discrete design: non-recurring charges, long lead times, and the uncertainties of a new, unproven product.

That's changed

Now, custom power manufacturers, or any power designer for that matter, using component power can not only specify exactly the module that they require, they can also verify its feasibility, place an order and have prototype quantities manufactured in six weeks or less - all on the Internet from their own computer.

It is important to understand that the system is not simply examining all the existing products and finding the closest one; nor is it tweaking an existing design. The expert software system is actually designing the module. From the ground up, it is a custom part.

What's different? The power designer can, of course, still choose the traditional approach to a custom power solution. Now, however, custom power manufacturers using power components are not limited to standard power components. If, for example, the application requires an offbeat 92 to 135 V input and an 8.7 V output at 420 W, the online expert system produces that design. The custom power manufacturer then uses the custom power component to design a completely custom solution.

This on-line, on-demand expert system offers a proven approach to custom module design with the added benefit of fast delivery and low initial expense. It is based on proven modules with a well-established record of performance and reliability that already possess agency approvals. Reliability of high-density modular DC-DC converters continues to improve, with MTBFs being quoted in the millions of hours.

It also helps power design engineers satisfy a new demand: system availability. Many businesses view access to information as being a mission-critical component of their operations. As a result, they have no tolerance for operating interruptions. More important, the cost of delivering unconditional availability is being exceeded by the cost of downtime. Ease of paralleling for fault tolerance and hot swap - readily available with component power solutions - are becoming mandatory for many applications.

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