

## ***DC-DC Converters Push Limits On Power Density For A Range Of Applications***

At the recent PCIM conference, [Vicor](#) unveiled two new dc-dc product platforms that continue the company's practice of reaching for higher power density. The company introduced new ChiP-based dc-dc converters providing up to 75.9 W/cm<sup>3</sup> power density and 93% efficiency while also unveiling new bricks offering 51% greater power density at up to 94% efficiency.

Vicor's new DCM platform of isolated, regulated dc-dc converter modules are based on the company's Converter housed in Package (ChiP) power component platform. Delivering up to twice the power density of conventional dc-dc converters, these ChiP DCMs enable power engineers to conserve valuable board space. ChiP DCMs can be utilized for a wide range of applications requiring high power density and thermal management flexibility.

The ChiP DCM platform spans dc-dc conversion requirements from 12-V to 420-V input and 12-V to 55-V output (Fig. 1.) Coupled with the company's FPA and ZVS regulators, these novel power components enable dense, efficient and scalable source-to-load power system solutions.

The PCIM announcement featured two pre-configured ChiP DCMs. The first is a 4623 (46- x 23-mm) 600-W ChiP DCM, with a nominal 290-V input and a 13.8-V output for applications such as HV Li-ion battery to 12-V systems. The second is a 3623 (36- x 23-mm) 320-W ChiP DCM with a 16-V to 50-V input range and a nominal 28-V output, optimized for 28-V MIL-COTS systems. ChiP DCMs provide up to 75.9 W/cm<sup>3</sup> power density (or about 1244 W/in<sup>3</sup>) and 93% efficiency, with the ability to parallel up to eight units.

Meanwhile, the company also introduced its HD Brick series of converters. The isolated HD Bricks retain the fundamental design attributes of conventional bricks, while providing up to 128 W/in.<sup>2</sup>, which represents up to 51% greater power density than competing brick products. At the same time, the HD Bricks deliver efficiency levels up to 94%.

HD Brick series dc-dc converters enable system designers to harness more power in less space than competing brick-style converters and Vicor's earlier generation Maxi, Mini and Micro dc-dc converters. The first two standard offerings in Vicor's HD Brick Series portfolio are a 320-W HD Brick with a nominal 28-V input (16-V to 50-V input range) and a 28-V output, in a 48.6-mm x 46.5-mm x 16-mm package, and a 400-W HD Brick with a nominal 300-V input (180-V to 420-V input range) and a 12-V out, in a 57-mm x 46.5-mm x 16-mm package (Fig. 2.)

These converters are available in flange and flangeless versions, can operate in harsh environments, and support three temperature grades, including operation down to -55°C. They can be deployed in combination with Vicor's ZVS Buck Regulators and VI Chip power components to power the point-of-load portion of a power system.



*Fig. 1. The ChiP DCM platform spans dc-dc conversion requirements from 12-V to 420-V input and 12-V to 55-V output. This platform includes two pre-configured ChiP DCMs: a 46- x 23-mm 600-W ChiP DCM with a nominal 290-V input and a 13.8-V output; and a 36- x 23-mm 320-W ChiP DCM with a 16-V to 50-V input range and a nominal 28-V output.*



*Fig. 2. Offering up to 51% greater power density than competing brick products, the Vicor's HD Brick series's first two standard offerings are a 320-W HD Brick with a nominal 28-V input and a 28-V output in a 48.6-mm x 46.5-mm x 16-mm package, and a 400-W HD Brick with a nominal 300-V input and a 12-V output in a 57-mm x 46.5-mm x 16-mm package.*

—Contributed by Cliff Keys