



onsemi Unveils Complete Power Solution to Improve Energy Efficiency for Data Centers

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Latest power semiconductor technology offers massive energy savings, power reduction of up to 10 TeraWatts

SCOTTSDALE, Ariz.--(BUSINESS WIRE)--Jun. 5, 2024-- **What's New:** As data centers become increasingly power-hungry to support the tremendous processing requirements of AI workloads, the need for boosting energy efficiency is paramount. The powerful combination of onsemi's latest generation [T10 PowerTrench® family](#) and [EliteSiC 650V MOSFETs](#) create a solution that offers unparalleled efficiency and high thermal performance in a smaller footprint for data center applications.

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onsemi's AI power solution (Graphic: Business Wire)

Why It Matters: Compared to a typical search engine request, an AI-supported engine request requires more than 10x the power, leading to data center power needs expected to reach an estimated 1,000 TWh

globally in less than two years¹. To process one AI-supported request, energy is converted four times from the grid to the processor, which can result in an energy loss of approximately 12%. Using the T10 PowerTrench family and EliteSiC 650V solution, data centers are able to reduce power losses that occur by an estimated 1%. If implemented in data centers globally, the solution could reduce energy consumption by 10 TWh annually or the equivalent of the energy required to fully power nearly one million homes per year².

How It Works: The EliteSiC 650V MOSFET offers superior switching performance and lower device capacitances to achieve higher efficiency in data centers and energy storage systems. Compared to the previous generation, these new generation silicon carbide (SiC) MOSFETs have halved the gate charge and reduced both the energy stored in output capacitance (Eoss) and the output charge (Qoss) by 44%. With no tail current during turn-off and superior performance at high temperatures, they can also significantly reduce switching losses compared to super junction (SJ) MOSFETs. This allows customers to downsize system components while increasing the operating frequency, resulting in an overall reduction in system costs.

Separately, the T10 PowerTrench Family is engineered to handle high currents, crucial for DC-DC power conversion stages, and offers increased power density and superior thermal performance in a compact footprint. This is achieved through a shield gate trench design, which boasts an ultra-low gate charge and an RDS (on) of less than 1 milliohm. Additionally, the soft recovery body diode and lower Qrr effectively minimizes ringing, overshoots, and electrical noise to ensure optimal performance, reliability, and robustness under stress. The T10 PowerTrench Family also meets the stringent standards required for automotive applications.

The combined solution also meets the stringent Open Rack V3 (ORV3) base specification required by hyperscale operators to support the next generation of high-power processors.

"AI and electrification are reshaping our world and skyrocketing power demands. Accelerating innovation in power semiconductors to improve energy efficiency is key to enabling these technological megatrends. This is how we power the future responsibly," said Simon Keeton, group president, Power Solutions Group, onsemi. "Our latest solution can significantly reduce power losses that occur during the energy conversion process and have a meaningful impact on the demands for the next generation of data centers."

More Information:

- [T10 PowerTrench Family](#)
- [EliteSiC 650V MOSFETs](#)
- [onsemi AI data center solution guide](#)
- [onsemi product recommendation tool](#)
- Simulate with [Elite Power Simulator](#) and [Self-Service PLECS Model Generator](#)

About onsemi

onsemi (Nasdaq: ON) is driving disruptive innovations to help build a better future. With a focus on automotive and industrial end-markets, the company is accelerating change in megatrends such as vehicle electrification and safety, sustainable energy grids, industrial automation, and 5G and cloud infrastructure. **onsemi** offers a highly differentiated and innovative product portfolio, delivering intelligent power and sensing technologies that solve the world's most complex challenges and leads the way to creating a safer, cleaner and smarter world. **onsemi** is recognized as a Fortune 500® company and included in the Nasdaq-100 Index® and S&P 500® index. Learn more about **onsemi** at www.onsemi.com.

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¹ IEA report, Electricity 2024

² Based on annual household power consumption from U.S. Energy Information Administration

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