

# QPT's Power Stage Technology with GaN Systems Semiconductors Takes Power Performance to a New Level

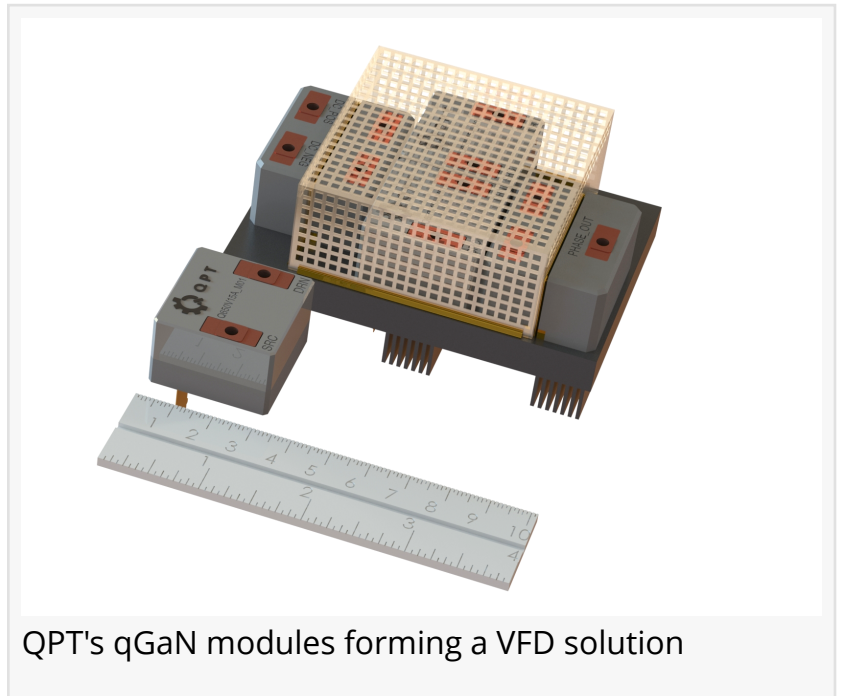
CAMBRIDGE, UNITED KINGDOM, July 12, 2023 /EINPresswire.com/ -- [QPT](https://www.einpresswire.com/) Limited recently announced that it has created the drive, control, and sense technologies to maximize GaN (Gallium Nitride) transistor performance and overcome design challenges in the 100 kHz to 20 MHz frequency range for high-power and high-voltage applications that use hard switching. This technology now unleashes the power performance in GaN-based designs, most dominantly in the automotive industry.

The QPT solution requires high-speed GaN transistors to deliver GaN's promised power efficiencies. The company has signed an MOU with GaN Systems Inc., who are a world leader in GaN power transistors, to investigate the possibilities of developing these technologies resulting in increased performance and further improvements that will boost the driving range of EVs.

Rob Gwynne, QPT's Founder, and CEO, stated, "GaN Systems produces the highest performing 650V power GaN devices, and this allows us to achieve the highest efficiency when combined with our technology. The better the efficiency of power usage, the greater the range of the EV."

Jim Witham, CEO at GaN Systems Inc, said, "We are impressed with the technologies that QPT has developed. They have unlocked functional improvement in performance, resulting in a highly optimized GaN solution for the EV market. In partnership, GaN Systems' transistors and QPT technology could dramatically change the GaN market."

The most significant boost to the EV range comes from QPT's ability to drive GaN much more efficiently. GaN transistors are the future of power electronics due to their ability to operate at



QPT's qGaN modules forming a VFD solution

higher frequencies for switching on and off. A slow switching transition wastes energy because, during the switching time, when the transistor is neither on nor off, it dissipates huge amounts of power, resulting in energy losses and overheating issues. The higher the switching speed, the less time is spent in transition, and the less energy is lost. GaN transistors can quickly transition from on to off at 1-2ns instead of 20-50ns for Si and SiC transistors. However, achieving maximum performance is challenging in some high-voltage, high-power applications.



QPT's solution enables the GaN transistors to be run at their full potential of up to 20 MHz with nanosecond switching to deliver better operational precision without RF interference issues or overheating. QPT's technology enables motors to be driven at up to 99.7% efficiency at peak load with hardly any decrease in efficiency at lower loads. This is a challenge for conventional designs today, where the efficiency can drop off rapidly at lower loads.

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*Jim Witham, CEO at GaN Systems Inc*

An additional boost comes from integrating and shrinking the Variable Frequency Drive (VFD) that controls the motor speed. Current VFDs are bulky, which means that it is invariably located away from the motor itself and then connected by copper cables that are big and heavy to cope with the hundreds of Amps or so going through them. QPT's next-generation GaN technology shrinks the size of a

VFD to around a twentieth of the size, reducing weight, and, more importantly, the size reduction means that it can be co-located beside the motor.

This integrated motor solution eliminates the need for long heavy copper cables, which can total up to a significant weight and cost reduction at around half a meter each. Additionally, the copper cables have resistance marking less power loss and reducing the overall system efficiency. All these factors mean that QPT's solution without copper cables can increase the range of the car.

“Our calculations show that our VFD solution can reduce power usage by around 10% and even more when the motor operates at low speeds,” concluded Rob Gwynne. “Together with the benefits of no long cables, that can significantly increase the range of an EV or a smaller battery

for the same range. Our technology is encapsulated into modules to form a plug-and-play solution that can be dropped in to replace an existing VFD with the rest of the existing system, such as the microprocessor and software stack, staying the same.”

#### About QPT Limited

Established in Cambridge in 2020 as an independent power electronics company, QPT™ specialises in the delivery of high-performance, efficient, and cost-effective solutions to solve the challenges of designing with Gallium Nitride transistors. QPT™ technology unlocks the potential of GaN to provide huge power savings across a wide range of electrical devices. Please visit [www.q-p-t.com](http://www.q-p-t.com) or contact [info@q-p-t.com](mailto:info@q-p-t.com) for further information.

#### About GaN Systems

GaN Systems is a global leader in GaN power semiconductors with an extensive transistor portfolio that uniquely addresses the needs of today's most demanding industries, including consumer electronics, data center servers, power supplies, renewable energy systems, industrial motors, and automotive electronics. As an industry-leading innovator, GaN Systems makes it possible to design smaller, lower-cost, more efficient power systems. The company's award-winning products provide system design opportunities free from the limitations of yesterday's silicon. By changing the transistor performance rules, GaN Systems enables power conversion companies to revolutionize their industries and transform the world.

For more information, please visit: [www.gansystems.com](http://www.gansystems.com) or Facebook, Twitter, and LinkedIn.

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