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Solar Optimizer Reference Design Demonstrates Efficiency Of GaN FETs

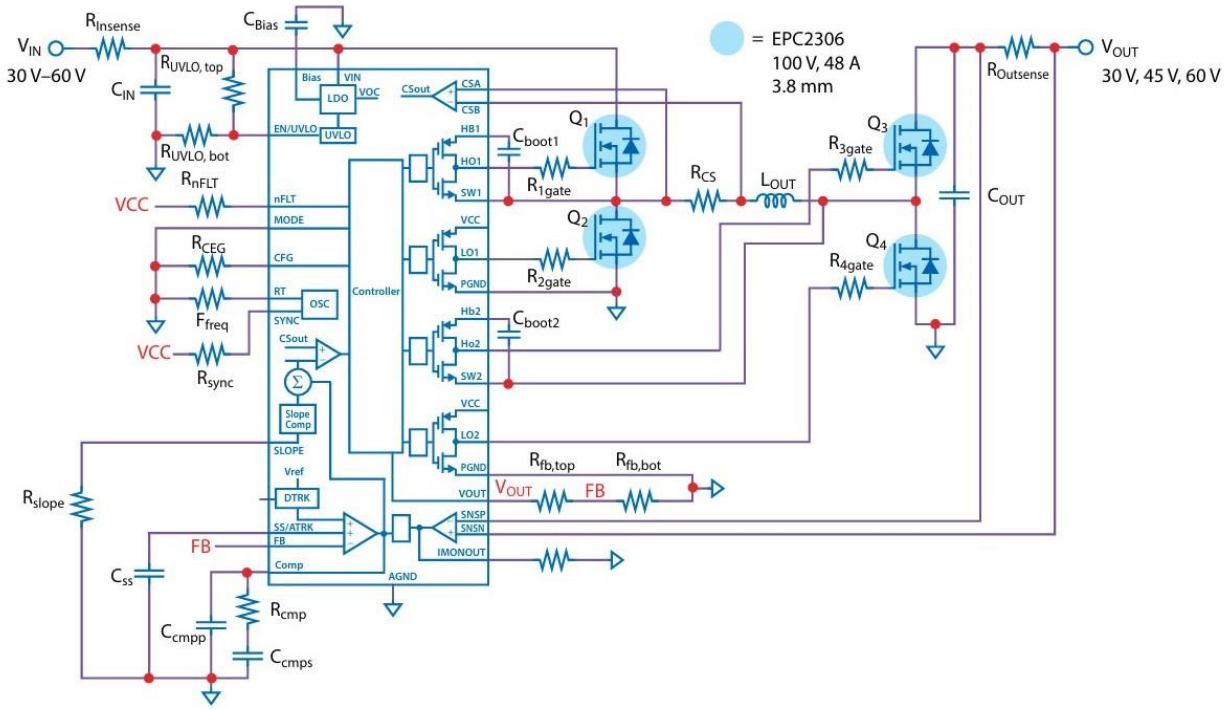
From Efficient Power Conversion (EPC), the EPC9178 is a reference design for photovoltaic (PV) optimizers. Designed to deliver high reliability while addressing critical challenges in energy efficiency and cost-effectiveness through the reduction of passive components in solar energy systems, the EPC9178 demonstrates the transformative potential of GaN technology for renewable energy solutions.

The EPC9178 reference design employs a back-to-back buck-boost converter topology, ensuring optimal energy harvesting for each solar panel, even under challenging conditions such as shading. This compact, high-performance solution bridges the gap between microinverters and string inverters, offering enhanced energy efficiency and compatibility with existing infrastructure.

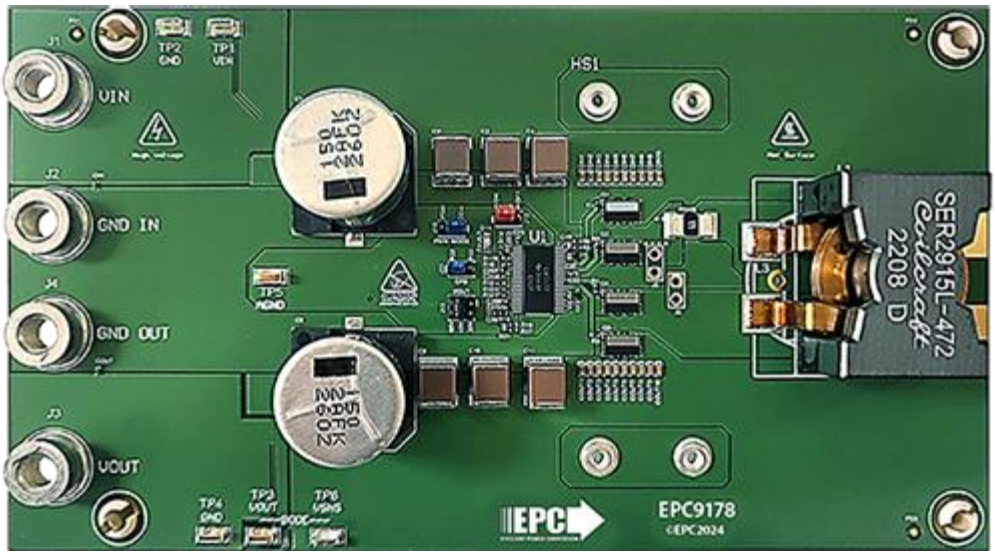
The EPC9178 combines cutting-edge GaN technology in the form of 100-V, 3.8-mΩ EPC2306 eGaN FETs with an advanced, dedicated controller (TI's LM5177) to deliver unmatched performance and reliability, according to the vendor. High-frequency operation at 450 kHz minimizes the size of passive components, resulting in a lightweight and space-saving solution, while also achieving up to 98% peak efficiency. The converter operates across an input voltage range of 30 V to 60 V, with selectable output voltages of 30 V, 45 V, and 60 V (see the figure).

"The EPC9178 delivers a compact, high-performance, and reliable design that enables cost-effective solar energy systems," said Alex Lidow, CEO of EPC.

The EPC9178 evaluation boards are priced at $480.00, while the EPC2306 is priced at $1.87/ea in 3Ku reels. For more information, see the EPC9178 page. Evaluation boards and devices are available for immediate delivery from Digi-Key.



(a)



(b)

Figure. The EPC9178 is a 30-V to 60-V input/output, 15-A max back-to-back converter reference design suitable for solar optimizers. Based on the EPC9178 100-V EPC2306 eGaN FET, this compact, high-performance solution is designed for high reliability and bridges the gap between microinverters and string inverters, offering enhanced energy efficiency and compatibility with existing infrastructure. The reference design schematic (a) and eval board (b) are shown here.