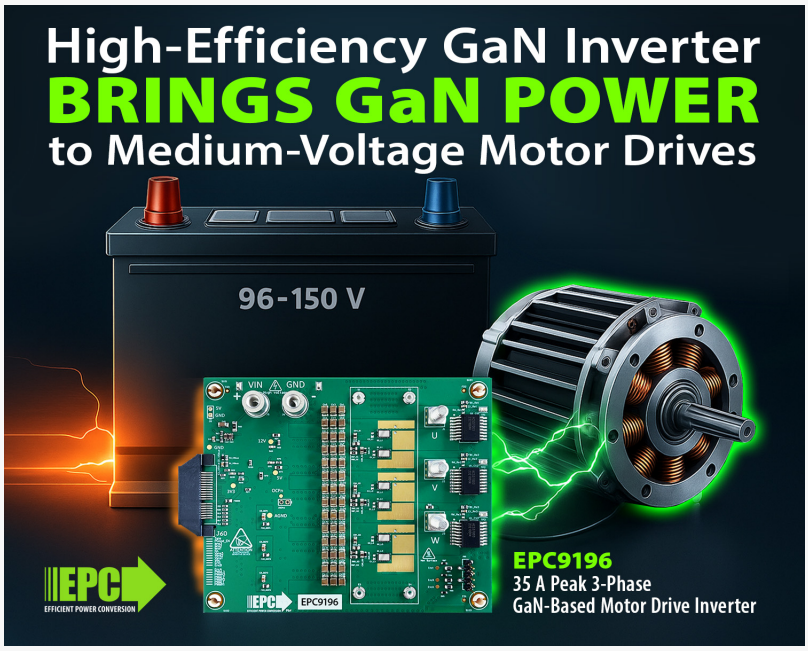
High-Efficiency GaN Inverter Brings GaN Power to Medium-Voltage Motor Drives

The EPC9196 is a 25 ARMS, 3-Phase BLDC Motor Drive Inverter optimized for 96–150 V Battery Applications



High-Efficiency GaN Inverter Brings GaN Power to Medium-Voltage Motor Drives

EL SEGUNDO, CA, UNITED STATES, June 10, 2025 /EINPresswire.com/ -- Efficient Power Conversion Corporation (EPC), the world leader in enhancement-mode gallium nitride (eGaN®) power devices announces the release of the EPC9196, a high-performance 25 ARMS, 3-phase BLDC motor drive inverter reference design powered by the EPC2304 eGaN® FET. The EPC9196 is specifically designed for medium-voltage (96 V – 150 V) battery-powered motor drive applications, including steering systems in automated guided vehicles (AGVs), traction motors in compact autonomous vehicles, and precision motor joints in robotics.

The EPC9196 fills a critical gap in the motor drive reference design landscape. With no other available reference designs operating at this voltage and current combination, EPC offers system designers a compact, efficient, and ready-to-deploy solution that accelerates development and optimizes system performance in the lower end of the 25–400 ARMS application range.

At the heart of the EPC9196 is the EPC2304, a 200 V-rated, 3.5 mΩ (typical) eGaN FET in a thermally enhanced QFN package. Chosen for its exceptionally low RDS(on) and unmatched performance in compact form factors, the EPC2304 enables the EPC9196 to deliver up to 35 Apk (25 ARMS) phase current at switching frequencies up to 100 kHz. This performance translates to low switching losses, minimal dead time, and a smooth, low-noise motor drive profile even at high PWM speeds.

Key features of the EPC9196 include:
- Wide input voltage range from 30 V to 170 V
- Integrated gate drivers, housekeeping power, current and voltage sense, over-current

protection, and thermal monitoring
• Compatible with multiple motor drive controller platforms from Microchip, ST, TI, and Renesas
• dv/dt control optimized for motor drive applications (<10 V/ns)
• Ready for sensor-less or encoder-based control configurations

The EPC9196 has been validated in real-world conditions, powering a 3-kW servo motor at 150 VDC and 60 kHz switching frequency. The design delivers clean waveforms with minimal ringing and demonstrates excellent thermal behavior with and without a heatsink, making it suitable for both bench evaluation and production-intent prototyping.

> “With the introduction of the EPC9196, we’re enabling engineers working in robotics, AGVs, and compact EVs to take full advantage of GaN’s superior performance without redesigning for high current,”
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> *Marco Palma, Director of Motor Drive Systems and Applications at EPC.*

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Price and Availability
The EPC9196 reference design boards are priced at $812.50
The EPC2304 is priced at $3.68/ea in 3Ku reels.
Reference design boards and devices are available for immediate delivery from Digi-Key at https://www.digikey.com/en/supplier-centers/epc

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