EPC Introduces Smallest GaN Drive Based on EPC33110 for Robots and Drones

23 mm GaN inverter achieves 11 ARMS continuous current at 48 V and 100 kHz PWM


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EL SEGUNDO, CA, UNITED STATES, June 9, 2026 /EINPresswire.com/ -- Efficient Power Conversion (EPC), the world leader in enhancement-mode gallium nitride (eGaN®) power devices, today introduced the EPC91132, a compact 3-phase BLDC motor drive inverter reference design based on the EPC33110 GaN three-phase module.

The EPC91132 is a 23 mm reference design inverter for small motor drives for humanoid wrists and hands and for drones. The EPC91132 incorporates the EPC33110 GaN module, which is based on EPC GaN monolithic integrated circuit technology. The EPC33110 has three half bridges, gate drivers, bootstrap circuitry and level shifters in a small 6 mm x 6.5 mm QFN package. The module can be powered by a single 5V power supply up to 80V with typical on-resistance of 11.7mΩ and supporting 3.3V or 5V logic inputs.

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>
> *Marco Palma, Vice President Motor Drive Marketing*

Next generation humanoid robots and drones require lighter, smaller and more efficient power electronics. GaN technology is a good candidate for motor drive systems to operate at switching frequencies above 100 kHz while minimizing conduction and switching losses. The capabilities improve efficiency, dynamic response and control bandwidth, reduce size of passive components and overall volume.

The EPC91132 has a wide 10 V to 60 V DC input range and includes all the key functions needed for an inverter including a microcontroller, regulated power supplies, DC bus voltage sensing, current sensing with embedded overcurrent protection and onboard magnetic encoder for rotor position and speed control. The EPC33110’s monolithic GaN architecture eliminates the need for discrete gate drivers and significantly reduces component count, simplifying PCB layout and accelerating system development. The platform is programmable through a dedicated connector and can be monitored in real time through the RS-485 communication.

The board has been designed with a flexible breakout-ring concept to support various form factors. With the outer ring removed, the board is 23 mm in diameter, which means it could be incorporated into small drone motors such as the Vertiq 23-06 platform.

Performance tests have shown that the EPC33110 module can provide a continuous current of 11 ARMS per phase for humanoid robotic joint applications operating at 48 V and switching frequency up to 100 kHz. In the drone motor testing, the system demonstrated excellent thermal performance with minimal temperature increase under the airflow from the propeller.

“The next generation of humanoid robots and drones requires motor drives that combine extreme compactness with exceptional efficiency,” said Marco Palma, Vice President Motor Drive Marketing and System Engineering, EPC. "The EPC91132 demonstrates how monolithic GaN integration can simplify inverter design while delivering the switching speed, power density, and thermal performance required for next-generation motion systems.”

Complete design support files, including schematics, bill of materials (BOM), and Gerber files, are available for download from the EPC91132 product page.

Price and Availability

The EPC91132 evaluation board is priced at $ 406.25.

Reference design boards and devices are available for immediate delivery from Digi-Key at: https://www.digikey.com/en/supplier-centers/epc and Mouser at https://eu.mouser.com/manufacturer/epc/

About EPC
EPC is the leader in enhancement mode gallium nitride (eGaN®) based power management. Founded in 2007 by experts in power electronics, semiconductors, and business management, the company leverages cutting-edge technology to advance the field of power electronics through the development and commercialization of GaN-based power devices. eGaN FETs and integrated circuits provide performance many times greater than the best silicon power MOSFETs in applications such as DC-DC converters, remote sensing technology (lidar), motor drives for eMobility, robotics, and drones, and satellites.

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