

5 kW GaN-Based AC/DC Reference Design for AI Server and Data Center Power Supplies

Modular 5 kW GaN Design from EPC Powers AI Servers and OCP ORv3 Racks

EL SEGUNDO, CA, UNITED STATES, October 22, 2025 /EINPresswire.com/ -- Efficient Power Conversion Corporation (EPC), the world leader in enhancement-mode gallium nitride (eGaN®) power devices announced the availability of a high-efficiency, high-power-density 5 kW AC-to-48 V DC reference design that demonstrates the full potential of gallium nitride (GaN) technology for next-generation server and AI power architectures.

The complete system—comprising the [EPC91107KIT](#) 4-Level Totem-Pole PFC and the [EPC91110KIT](#) Input-Series Output-Parallel (ISOP) LLC Converter—achieves up to 96.5% system efficiency and a combined power density of 116 W/in³. Designed to meet Open Rack V3 (OCP ORv3) size requirements, this modular solution delivers superior performance with dramatically smaller size and lower cost compared to equivalent silicon implementations.

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GaN is transforming power conversion for AI and data centers, delivering higher efficiency, smaller size, and lower cost—without compromising scalability or reliability,”

Alex Lidow, CEO of EPC

- 25 A input current, 240 VAC nominal, switching frequency of 140 kHz



A Complete 5 kW GaN Power Solution

The EPC91107KIT front-end stage converts 240 VAC to 400 VDC using a 4-Level Flying Capacitor Totem-Pole PFC topology featuring EPC2304 (200 V, 5 mΩ) GaN FETs.

- 9× smaller PFC inductor and 40% smaller EMI filter than conventional two-level designs
- Up to 98.5% efficiency at 5 kW

The EPC91110KIT isolation stage steps down the 400 V bus to 50 VDC in a fixed ratio using four modular 1.375 kW LLC converters in an ISOP configuration. Each module employs the EPC2305 (150 V, 3 mΩ) GaN FET and achieves 98.2% peak efficiency and 5.5 kW output in total.

Optimized for AI, Cloud, and Enterprise Power Architectures

As AI workloads drive unprecedented demand for high-efficiency power delivery, GaN's high frequency and low loss performance enable smaller filters, reduced thermal requirements, and higher power density.

The EPC 5 kW reference design supports a modular power architecture scalable to 33 kW, 48 kW, and as high as 108 kW rack systems for less cost, delivering industry-leading efficiency and cost savings for AI servers, data centers, and telecom power shelves

"GaN is transforming power conversion for AI and data centers, delivering higher efficiency, smaller size, and lower cost—without compromising scalability or reliability," said Alex Lidow, CEO of EPC.

Design files and quick start guides for the EPC91107KIT and EPC91110KIT are available for download at [EPC's Low-Voltage GaN for AC/DC Application page](#)

Price and Availability

The EPC9110KIT reference design boards are priced at \$1095.00

The EPC2304 is priced at \$3.68/ea in 3Ku reels.

The EPC91107KIT reference design boards are priced at \$919.50

The EPC2305 is priced at \$3.56/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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