Richtek and EPC Collaborate to Create Small 140 Watt Fast-charging Solution

EPC and Richtek introduce a reference design that achieves greater than 98% efficiency using the RT6190 buck boost controller and EPC2204 EPC GaN FETs

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EL SEGUNDO, CA, UNITED STATES, January 12, 2023 /EINPresswire.com/ -- EPC & Richtek announces the availability of a 4-switches bidirectional buck-boost controller reference design board that converts an input voltage of 12 V - 24 V to a regulated 5 V - 20 V output voltage and delivers up to 5 A continuous current and 6.5 A maximum current. The combination of the new Richtek RT6190 controller with ultra-efficient EPC2204 GaN FETs from EPC shrinks the solution size by greater than 20% compared to traditional solutions for high-power density applications. The solution achieves greater than 98% efficiency for 20 V and 12 V output voltage and can operate without heatsink with maximum rise temperature below 15 degC for 20 V to 5 V, and 55 degC for 12 V to 20 V, at 5 A continuous current.

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> *Alex Lidow, EPC's co-founder and CEO.*

The high-power density makes this solution ideal for buck boost converters with input 4 V-36 V and output 3 V-36 V like the ones used for 5 V-36 V battery chargers, battery stabilizers to 5 V – 36V and USB PD 3.1 charging (5 V, 20 V, 28 V, 36 V support). GaN FETs provide the fast switching, high efficiency and small size that can meet the stringent power density requirements of these leading-edge applications.

The reference design uses the EPC2204 100 V enhancement-mode EPC GaN FET and the RT6190

4-switches buck boost controller with integrated GaN drivers.

• The RT6190 is a 4 – switches bidirectional buck boost controller with I2C interface using peak current mode control. The input voltage ranges between 4 V and 36 V and the output voltage is programmable between 3 V and 36 V and supports dynamic voltage scaling. The switching frequency reaches up to 1 MHz for high power density and the device offers power saving mode for high light load efficiency. Output current, voltage and soft start can be precisely programmed, and the device is fully protected and offers OCP, UVLO, OVP, OTP, cycle by cycle current limit, and PGOOD in a tiny package, 5 mm by 5 mm.

• The EPC2204 is a 100 V GaN FET with 6 mOhm max RDS(on), 5.7 nC QG, 0.8 nC QGD, 1.8nC QGS and zero QRR in a super small 2.5 mm x 1.5 mm footprint and can deliver up to 29 A continuous current and 125 A peak current. The excellent dynamic parameters allow very small switching losses at 500 kHz – 1 MHz switching frequency, especially in hard switching applications like buck boost converters. Higher switching frequency enable to reduce the inductor value, size, and DCR and the capacitor count for less losses and higher power density.

Alex Lidow, CEO of EPC commented, “GaN FETs are required to achieve the maxim power density for DC-DC converters. We are delighted to work with Richtek to combine the benefits of their advanced controllers with the performance of GaN to provide customers with the highest power density and low component count solution that increases the efficiency, increases power density, and reduces system cost”

“The Richtek Device’s RT6190 is designed to fully exploit the high performance of EPC’s eGaN FETs for high power density solutions” said by Eason Chen, ,Sr. Application Marketing Manager at Richtek, “The RT6190 offers higher switching frequency and integrates all protections feature and functionality required for 4-switches buck boost controller for battery chargers and battery management/stabilizers to a fixed voltage, very common for consumer USB applications for PC and smart phone, e-bike, e-scooter, battery-operated appliances and power tools, medical, industrial and solar applications. With these new controllers, customers can take advantage of the very fast switching of GaN for the highest power density.”

Availability

Richtek RT6190 is in mass production now. For more information on the RT6190, please visit: RT6190 - 36V, 4-Switch Bidirectional Buck-Boost Controller with I2C Interface | Richtek Technology

Or please visit the Richtek web: www.richtek.com / Contact Us | Richtek Technology

EPC2204 is in mass production now. For more information on the EPC2204, please visit: EPC2204: 100 V, 125 A Enhancement-Mode GaN Power Transistor

About EPC

EPC is the leader in enhancement mode gallium nitride (eGaN®) based power management. 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 low-cost satellites.

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About Richtek

Richtek Technology Corporation is one of the world's leading analog IC companies. The company consistently delivers inventive power management solutions that improve the performance of consumer electronics, computers, and communications equipment. Richtek adds value to end equipment by synthesizing technological innovation, uncompromised quality, and devotion to customer service. Founded in 1998, the Company is headquartered in Taiwan with additional offices in Asia, the U.S., and Europe. For more information about Richtek and its analog IC solutions, please visit the Company's Web site at www.richtek.com.

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