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Eggtronic Launches Ultra-High Efficiency, Low Component Count Solution for AC/DC Designs Including Power Factor Correction

EcoVoltas SmartEgg Technology Delivers Efficiencies to 95% and Halves Component Count in Applications to 1kW

100W/1kW PFC + AC/DC

EGGTRONIC SmartEgg
Efficiency 95%

	Magnetic	High Voltage High Side FET	High Voltage Low Side FET	Low Voltage High Side FET	Low Voltage Low Side FET	
SmartEgg	SMO 3650 mm ²	1	1	1	1	Single SMO core 4 Active components
Boost PFC+LLC	SMO+SM7 20800 mm ²	2	2	2	2	SM7 + SMO cores 8 Active components

APEC, HOUSTON, Tx, 22nd March 2022 – Eggtronic has expanded its EcoVoltas family of high-efficiency AC/DC architectures with the launch of SmartEgg, a Zero Voltage Switching (ZVS) solution for power applications in the 75 to 1kW range that need both output voltage regulation and power factor correction (PFC). By enabling much higher no-load-to-full-load efficiency and a 50% smaller bill of materials (BOM) than conventional converters, SmartEgg significantly increases the power density and reliability of AC/DC converter designs. It is also one of the first platforms to support the new USB Power Delivery Revision 3.1 specification delivering up to 240W of power over full featured USB Type-C cables and connectors.

Traditional medium-power AC/DC PFC architectures employ a boost PFC input stage and an LLC stage that controls the output voltage. SmartEgg halves the number of MOSFET and magnetic components required by replacing these two stages with a single-stage converter capable of controlling both input current and output voltage. Forced ZVS under every load condition delivers efficiencies of up to 95% at full load and 92% at light load.

SmartEgg consists of an input rectifier (Eggtronic offers solutions based on either an input bridge or bridgeless rectifier), two primary FETs, two secondary FET rectifiers, a single magnetic component and a few capacitors. The main controller manages PFC and output voltage regulation, ZVS and frequency control.



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Eggtronic engineers can create custom designs based on the new SmartEgg architecture or they can provide the reference design together with the IC controller. Output options are fixed voltage, CC/CV battery charger, and USB PD 3.1. The first fixed voltage reference design is available now, with a multi-port USB PD 3.1 compliant version available in May 2022.

“SmartEgg is the latest in a series of power conversion architectures that make up the Eggtronic EcoVoltas family. Specifically developed to deliver cost-effective, smaller, and higher efficiency power conversion, SmartEgg can achieve power densities of 30W/in³ to help engineers meet performance, cost, size, weight and sustainability goals in next-generation AC/DC applications,” said Michael Maia, Vice President Semiconductor Sales and Marketing at Eggtronic. *“In the past, engineers have attempted to develop a viable single-stage solution that acts simultaneously as a PFC and isolated voltage regulator but have failed mainly because of the complexity of the control algorithm and cost of the controller. We worked hard to create a cost-effective patented controller able to run our proprietary algorithm that makes single-stage architectures a reality.”*

Target applications for SmartEgg include adapters and chargers for high-performance laptops and power adapters for PCs, home appliances and TV panels.



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About Eggtronic:

[Eggtronic](#) has been revolutionising the world of power converters and wireless power since 2012. Based in San Francisco, Modena, Italy, Taipei, Taiwan, and Guangzhou, China, Eggtronic develops cutting-edge, environmentally-friendly and energy-efficient technologies, with more than 240 international patents granted worldwide. 2020 saw the launch of the new ICs division that has been producing its first microchips since 2021. Whether through B2B partnerships in the consumer, automotive, or industrial fields, or for everyday consumers, Eggtronic invents revolutionary power technologies to make modern life easier, more efficient and more connected.

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