

Silanna Semiconductor Takes ACF Integration to the Next Level With Their New SZ1200

Highly integrated ACF controller simplifies and speeds design of high-efficiency, high-power-density AC/DC power supplies and adapters

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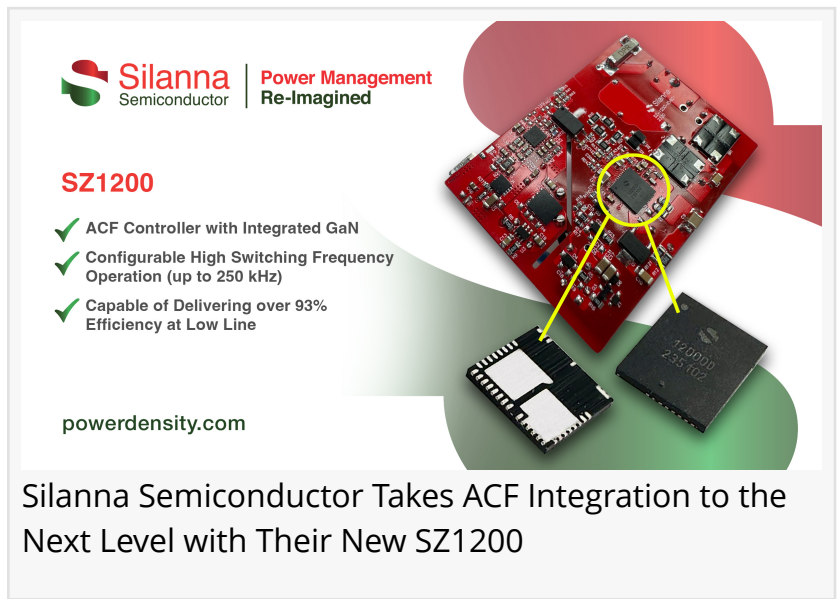
[Semiconductor](#), The Power Density Leader, has expanded its CO2 Smart Power Family™ of AC/DC and DC/DC converter technologies with the launch of an active clamp flyback (ACF)

controller that integrates adaptive digital PWM control with ultra-high-voltage (UHV) components comprising a 700 V primary GaN FET, X capacitor (X-Cap) discharge circuit, active clamp driver and start-up regulator.

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Ashan Zaman, Director of Product Marketing at Silanna Semiconductor



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Silanna’s CO2 Smart Power technologies help engineers by simplifying design and improving performance while addressing environmental sustainability goals through more efficient energy use. Well-suited for high-efficiency and high-power-density power supplies, USB-PD/QC AC/DC power adapters and battery charging applications, the new SZ1200 integrated ACF controller combines the ease of design of a simple flyback controller with all the benefits of ACF. These include recycling of the leakage inductance energy of the flyback transformer and limiting primary FET drain voltage spikes during turn-off events.

Delivering above 93% efficiency at low line, the SZ1200 offers consistent efficiency across the universal input voltage range (90 - 265 Vac) and various loading conditions of up to 150W single-port and multi-port USB-PD applications. Silanna’s OptiMode™ digital control architecture adjusts operation mode on a cycle-by-cycle basis to maintain high efficiency, low EMI, fast dynamic load

regulation and other key power supply parameters as line voltage and load vary. Very low no-load power consumption for the most stringent USB-PD applications further minimizes energy use during system stand-by.

“Our goal is to make it as easy as possible for power design engineers to develop ultra-efficiency, high-density power conversion designs in the shortest time possible,” says Ahsan Zaman, Silanna Semiconductor’s, Director of Product Marketing. “The addition of the SZ1200 to our family of ACF technologies supports this goal by offering high-speed switching, unprecedented levels of integration and functionality that ensures optimum efficiency across wide input and loading conditions while minimizing EMI.”

By allowing designers to program switching frequency to up to 250 kHz, the new controller supports high power densities while advanced digital active clamp operation ensures best-in-class efficiency. Switching frequency is confined within a tight frequency band to simplify EMI filtering. Further efficiency and EMI performance benefits are realized through adaptive digital control of the active clamp operation, which enables near ZVS turn-on of the primary FET and clamps the drain voltage during the turn-off.

SZ1200 also incorporates continuous conduction mode (CCM) operation, which allows delivering up to 225% rated output power for a limited duration without sacrificing the power density. This feature is targeted for applications requiring peak power, such as laptop and notebook power adapters.

SZ1200 Key Features

- High-frequency ‘CO2 Smart Power’ ACF controller
- Configurable high-switching-frequency operation (up to 250 kHz)
- Integrated 700 V GaN primary FET
- Integrated UHV X-cap discharge circuit, active clamp driver and start-up regulator
- Over 93% efficiency at low line
- Flat efficiency across universal input voltage (90 - 265 Vac) and loading conditions
- CCM for increased peak power delivery and better utilization of transformer core in universal input applications
- QR valley mode switching and boosting for low EMI and near-ZVS operation
- OptiMode™ cycle-by-cycle adaptive digital control
- Regulated burst-mode
- Self-tuning valley detection
- OTP, OVP, OCP, OPP, OSCP among various other protections
- Very low system no-load power consumption
- Space-saving 37-pin 8 mm X 7 mm QFN Package

Availability:□

Target engineering sample release date is April 2024 with full production planned for the end of Q2, 2024. Further information is available at <https://powerdensity.com/reference-design/> or by contacting sales@silanna.com.

About Silanna Semiconductor

The Power Density Leader. Delivering on the ultimate Power Management challenge of best-in-class power density and efficiency performance that delights customers with unprecedented BoM savings. Silanna Semiconductor's AC/DC and DC/DC power converter ICs are driving key innovations in Travel Adapters, Laptop Adapters, Appliance Power, Smart Metering, Computing, Lighting, Industrial Power, and Display Power utilizing the latest digital and analog control and device technologies. In addition to our global engineering sales force, customers are supported by regional design centers and online tools. 'Power Density Hero' is an online design tool where customers input their power needs and instantly receive a complete design, schematic, and 'Bill of Materials' (BOM). The Asian Center of Excellence (ACE) has a dedicated team of power system engineers to support our customers in their application specific design needs.

Silanna Semiconductor, with its family of [CO2 Smart Power™](#) ICs, offers technologies that will benefit the planet and the people on it by delivering best-in-class power density and efficiency.

Silanna Semiconductor, headquartered in San Diego, CA, is a privately-held semiconductor company, and has global facilities supporting customers with design centers and offices in North America, Europe, Asia, and Australia.

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