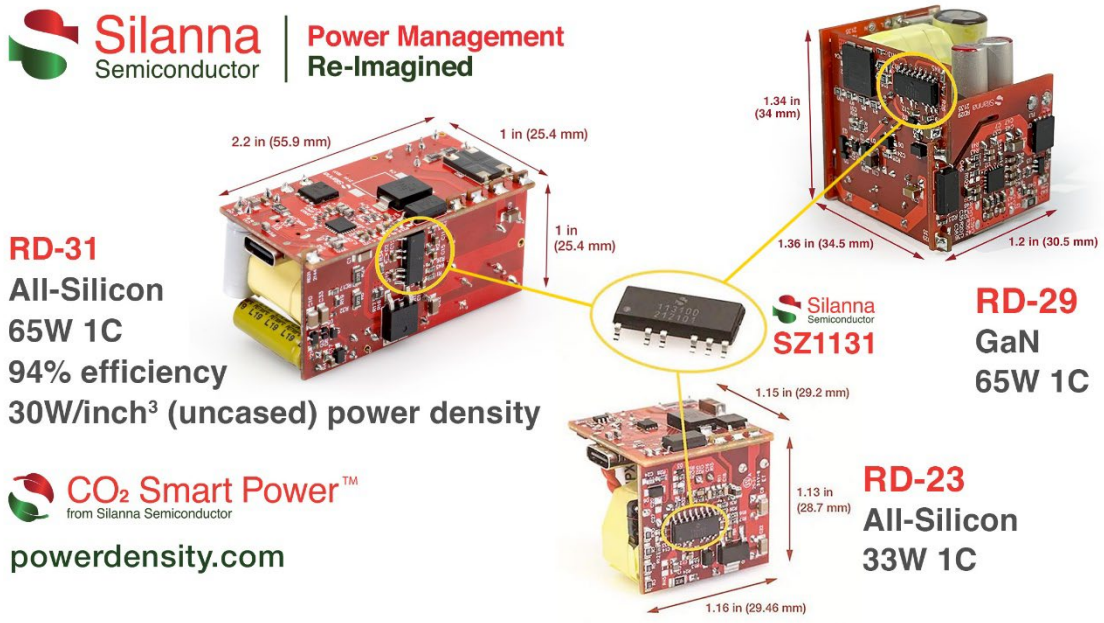
Silanna Semiconductor Extends All-Silicon Reference Design Family to 65W

Industry's most efficient all-silicon Active Clamp Flyback (ACF) 65W design joins 33W silicon and 65W GaN variants to deliver industry's most comprehensive family of production-ready USB-PD GaN and silicon solutions



San Diego, CA – Date – Silanna Semiconductor, The Power Density Leader, has launched a new active clamp flyback (ACF)-based reference design that simplifies and speeds the development of 65W 1C fast charger applications built using silicon power ICs. Featuring the company's latest CO_2 Smart Power™ ACF controller technology, the Silanna Semiconductor RD-31 provides a route to delivering performance that matches or exceeds that of many commercially available 65W GaN-based chargers at a cost more readily associated with conventional silicon designs.

The RD-31 is the latest in a family of production-ready reference designs that provide everything needed to prototype and develop a fully functional charger with low operational and no-load/ stand-by power consumption and minimum component count, BOM cost and size. This family includes all-silicon 33W and GaN-based 65W USB-PD reference designs.

As with the company's existing 65W GaN and 33W silicon reference designs, Silanna's new RD-31 is based on the ultra-high-efficiency SZ1131 ACF controller, which is rated for 65W and above 100W operation in universal input and PFC applications, respectively. This controller offers the industry's highest level of integration by incorporating an adaptive digital PWM controller, ultra-high-voltage (UHV) active clamp FET, active clamp gate driver and startup regulator into a single compact device.

Providing an (uncased) power density of 30W/inch^3, the RD-31 operates with a peak efficiency of around 94% and has a no-load power consumption below 25mW. Efficiency is flat across the universal input voltage range (90 – 265Vac) and the reference design is fully production-ready as it exceeds conducted and radiated EMI requirements by more than 6dB. In benchmarking tests the RD-31 exceeded the efficiency of the best-in-class commercially available GaN-based power adapter by 0.5% and reduced no-load vampire power by as much as 44%.

"We are committed to helping engineers deliver high-performance chargers with ever higher power densities by developing technologies that increase operational efficiency and reduce vampire power," says Ahsan Zaman, Silanna Semiconductor's director of product marketing. "By building production-ready reference designs around these technologies we are also simplifying the design-to-manufacturing cycle to ensure these advanced charger designs move to production in the shortest possible time."

The SZ1131 operates at frequencies up to 146kHz and provides the ease-of-design of a simple flyback controller with all the benefits of an ACF design. This includes recycling the leakage inductance energy of the flyback transformer and limiting the primary FET drain voltage spike during turn-off events. Employing Silanna Semiconductor's OptiMode™ digital control architecture, the SZ1131 adjusts the device's mode of operation on a cycle-by-cycle basis to maintain high efficiency, low EMI, fast dynamic load regulation, and other key power supply parameters in response to varying line voltage and load conditions.

Supplied in a 16-pin SOIC package, the SZ1131 offers protection against over-temperature, over-voltage, over-current, over-power, output short circuit, and transformer core saturation faults without the need for additional external components.

To further speed designs based on the RD-31 all PCB Gerber files and production files are available on request.

RD-31 Key Features

- 65W 1C high-power-density (30W/inch^3 uncased) reference design
- 94% peak efficiency
- < 25mW system-level no-load power consumption
- > 6dB conducted and radiated EMI margins
- Flat efficiency across universal (90 – 265Vac) input voltage and load
- Uses Silanna Semiconductor's newest fully integrated ACF controller (SZ1131)
    - SZ1131 integrates ACF controller with UHV active clamp FET, active clamp driver, and start-up regulator
    - Up to 146kHz switching frequency operation
    - Ultra-low no-load power consumption
    - OptiMode™ cycle-by-cycle adaptive digital control
    - Self-tuning valley mode switching (VMS)
    - Multi-mode operation (burst mode, QR, VMS)
    - OTP, OVP, OCP, OPP, and Output Short Circuit Protections
- CO_2 Smart Power by Silanna Semiconductor

Availability:

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 CO_2 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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