

65-W ACF Reference Design Achieves 30-W/in³ Power Density

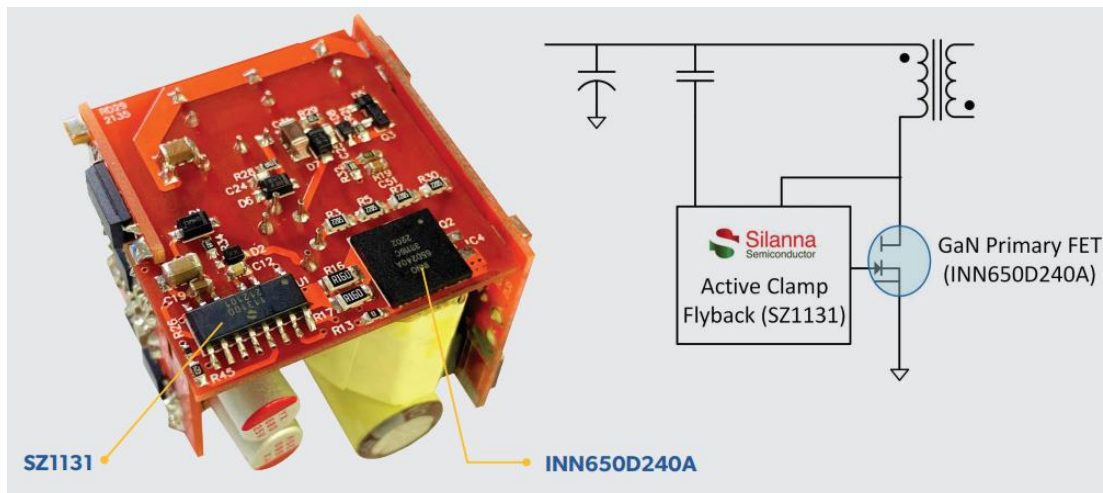
[Innoscence Technology](#) and Silanna Semiconductor have demonstrated a 65-W active clamp flyback (ACF) reference design with 30-W/in³ uncased power density at the recent PCIM exhibition. The design achieves efficiency levels of greater than 94% at 230 Vac and has a no-load power consumption of less than 25 mW.

The design combines the performance of Innoscience's INN650D240A 650-V GaN-on-silicon enhancement-mode power transistor with Silanna's SZ1131 fully integrated active clamp flyback (ACF) controller (see the figure). The GaN HEMT enables ultra-high switching frequency, has no reverse-recovery charge and low gate charge and low output charge. $R_{DS(on)}$ max is 240 m Ω . Silanna's CO2 Smart Power SZ1131 combines high integration and operational efficiency (95%) with an ultra-low no-load power consumption of under 20 mW.

The 65-W reference design offers a PCBA measuring just 34 x 34.5 x 30.5 mm. It has an input voltage range of 90 to 265 Vac and offers USB-PD output voltages and current configurations of 5 V and 3 A, 9 V and 3 A, 15 V and 3 A, and 20 V and 3.25 A. Innoscience and Silanna Semiconductor are also collaborating on higher power multi-port reference designs and will introduce them to the market soon.

Yi Sun, general manager, Innoscience America comments, "By enabling faster switching speeds, improved efficiencies and smaller components, the ACF topology addresses demands for improved performance and lower power consumption while minimizing power supply size and weight. Silanna's integrated controller ICs and Innoscience's designer-friendly, robust and reliable GaN FETs are a perfect match, enabling this application."

More information about this reference design and full test report will be available on the reference design [page](#) in June 2022. For sample requests, email sales@silanna.com.



Features

- Topology: Fully-Integrated Active Clamp Flyback (ACF)
- Input Voltage Range: 90-265Vac
- Max Output Power: 65W
- Output Voltages/Currents: USB-PD; 5V/3A, 9V/3A, 15V/3A, 20V/3.25A
- Transformer: RM-8
- Efficiency: > 94% @ 230Vac
- No-Load Power: < 25 mW
- Size: 34*34.5*30.5mm (PCBA)
- Power Density: 30W/in³ (PCBA)
- Part Numbers: SZ1131 + INN650D240A

Figure. At the recent PCIM exhibition, Innoscience Technology and Silanna Semiconductor demonstrated a 65-W active clamp flyback (ACF) reference design that leverages the former's ACF controller and the latter's GaN FET to achieve an uncased power density of 30-W/in³.