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Digital Controller For GaN Totem-Pole PFC Enables 2-MHz Switching

[Wise Integration](#)'s WiseWare 1.1 (WIW1101), the company's first fully digital controller, enables high-frequency operation up to 2 MHz, unlocking new levels of power density, efficiency, and form factor in compact ac-dc power converters, according to the vendor. Based on a 32-bit MCU, the controller is now available and ready for volume production in customer-validated designs, and is offered in a 48-pin LQFP (see the figure).

"This release marks a strategic milestone for Wise Integration's roadmap," said Thierry Bouchet, CEO of Wise Integration. "WiseWare 1.1 represents more than a product—it's a key pillar in our vision to redefine power electronics through digital control. It strengthens our value proposition in high-density power conversion and reinforces our leadership as GaN technology scales to mass adoption."

Unlike legacy analog solutions, WiseWare 1.1 leverages the speed and switching capabilities of GaN power devices through a proprietary digital control algorithm in a 32-bit MCU, enabling zero voltage switching (ZVS) across all power transistors. Designed specifically for totem pole power-factor correction (PFC) architectures in critical-conduction mode (CrCM), this controller allows engineers to dramatically reduce the size, weight, and thickness of magnetic components while maintaining >98% efficiency.

WiseWare 1.1 supports a broad power range from 100 W to 1.5 kW, making it suitable for a wide array of modern applications requiring both compactness and high energy efficiency. Designed with flexibility in mind, WiseWare 1.1 works seamlessly with standard GaN across the full $R_{DS(ON)}$ spectrum, giving power designers the freedom to choose the optimal transistor for each application—without compromising performance.

The WiseWare 1.1 platform has already demonstrated robust market validation, with multiple customer designs and live demos at PCIM Europe. These demonstrations showcased 300-W totem pole PFC converter boards using WiseWare 1.1 and WiseGan WI71060A 60-m Ω transistors, operating from 90 to 264-Vac input to a 400-Vdc output. At the same time, technical collaborations are progressing in Asia, reinforcing the company's global reach.

The WiseWare 1.1 (WIW1101) also features integrated protection features such as overcurrent, overvoltage, overtemperature and overpower. Standby power is as low as 18 mW. An EMC-compliant demo board with >98% efficiency is available. For more information, see the [product page](#) or the [datasheet](#).



Figure. Unlike legacy analog solutions, WiseWare 1.1 leverages the speed and switching capabilities of GaN through a proprietary digital control algorithm in a 32-bit MCU, which enables zero voltage switching across all power transistors. Designed specifically for totem pole power-factor correction (PFC) architectures in critical-conduction mode (CrCM), this controller allows engineers to dramatically reduce the size, weight, and thickness of magnetic components while maintaining >98% efficiency.