Transphorm and Weltrend Semiconductor Release New Integrated GaN System-in-Packages

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SuperGaN-based SiP Family Now Includes Three Devices, Expanding Power Level Support for a Wider Range of Next Generation Adapters and Chargers

GOLETA, Calif. & HSINCHU, Taiwan--(BUSINESS WIRE)--Apr. 24, 2024-- Transphorm, Inc. (Nasdaq: TGAN), a global leader in robust GaN power semiconductors, and the global leader in adapter USB Power Delivery (PD) Controller Integrated Circuits (IC) Weltrend Semiconductor Inc. (TWSE: 2436) today announced availability of two new GaN System-in-Packages (SiPs). When combined with Weltrend's flagship GaN SiP announced last year, the new devices establish the first SiP product family based on Transphorm's SuperGaN® platform.

The new SiPs—WT7162RHUG24B and WT7162RHUG24C—integrate Weltrend's high frequency multi-mode (QR/Valley Switching) Flyback PWM controller with Transphorm's 150 mΩ and 480 mΩ SuperGaN FETs respectively. Like their 240 mΩ predecessor (WT7162RHUG24A), the devices pair with USB PD or programmable power adapter controllers to provide a total adapter solution. Notably, they also offer several innovative features including the UHV valley tracking charge mode, adaptive OCP compensation, and adaptive green mode control among others that allow customers to design high quality power supplies faster and with fewer components using the simplest design approach.

"When we launched our first GaN SiP last year, it was an important milestone in our company's evolution. It demonstrated a new GTM strategy for the AC-to-DC power market," said Wayne Lo, Vice President of Marketing, Weltrend. "Today's news confirms we're continuing to serve that space with a wider selection of devices designed to support a wider assortment of product power levels. A total packaged solution with Transphorm's SuperGaN platform delivers design simplicity with unparalleled performance for devices now ranging from low 30-watt USB-C PD power adapters through to nearly 200-watt chargers, a unique Transphorm GaN capability."

End product manufacturers seek ways to develop new adapters with a reduced bill-of-materials (BOM) that offer versatility, fast charging, and higher power outputs. Additionally, in many cases they seek to deliver "one-size-fits-all" chargers with multiple ports and/or multiple types of connections. All of this in smaller, lighter weight form factor.

Some key advantages of Transphorm's normally-off d-mode SuperGaN platform include best-in-class robustness (+/- 20 V gate margin with a 4 V noise immunity) and reliability (< 0.05 FIT) with the ability to increase power density by 50% over silicon. Weltrend's elegant SiP designs harness those advantages along with its own innovative technologies to create a near plug-and-play solution that speeds design while reducing form factor size.

"SiPs are an important device option when considering the needs of adapter and charger manufacturers," said Tushar Dhayagude, Vice President of Worldwide Sales and FAE, Transphorm. "These systems require effective power conversion that, while simple to use with integrated functionality, also minimize learning curves to ensure quick design in. The first device released validated the performance and versatility of a SuperGaN SiP. The new devices announced today validate both our companies' deepening commitment to arming customers with choice."

Key Specifications

	WT7162RHUG24A	**WT7162RHUG24B (new)**	**WT7162RHUG24C (new)**
Rds(on)	240 mΩ	150 mΩ	480 mΩ
Vds min	650 V		
Power Efficiency	> 93%		
Power Density	26 w/in^3		
Max Frequency	180 kHz		
Wide Output Voltage Operation	USB-C PD 3.0 PPS 3.3V~21V		
Package	24-pin 8x8 QFN		

Key Features

Feature	**Advantage**
Adjustable GaN FET gate slew rate control	Balances out efficiency and EMI compliance
External VDD linear regulator circuit not required (700 V ultra HV start-up current pulled directly from AC Line voltage)	Reduces component count
Reduced package inductance	Maximizes chip performance
Fits in a standard 8x8 QFN FF	Allows for low profile/small system footprint

Target Applications and Availability

Weltrend's SuperGaN SiP family is optimized for use in high-performance, low-profile USB-C power adapters for mobile/IoT devices such as smartphones, tablets, laptops, headphones, drones, speakers, cameras, and more.

Additional device specifications are detailed in the datasheets here:

- WT7162RHUG24A (240 mΩ): http://www.weltrend.com/en-global/product/detail/67/124/610
- WT7162RHUG24B (150 mΩ): http://www.weltrend.com/en-global/product/detail/67/124/633
- WT7162RHUG24C (480 mΩ): http://www.weltrend.com/en-global/product/detail/67/124/634

The two new devices (WT7162RHUG24B and WT7162RHUG24C) are currently sampling. Contact sales@weltrend.com.tw for more information.

About Transphorm

Transphorm, Inc., a global leader in the GaN revolution, designs and manufactures high performance and high reliability GaN semiconductors for high voltage power conversion applications. Having one of the largest Power GaN IP portfolios of more than 1,000 owned or licensed patents, Transphorm produces the industry's first JEDEC and AEC-Q101 qualified high voltage GaN semiconductor devices. The Company's vertically integrated device business model allows for innovation at every development stage: design, fabrication, device, and application support. Transphorm's innovations move power electronics beyond the limitations of silicon to achieve over 99% efficiency, 50% more power density and 20% lower system cost. Transphorm is headquartered in Goleta, California and has manufacturing operations in Goleta and Aizu, Japan. For more information, please visit www.transphormusa.com. Follow us on Twitter @transphormusa and WeChat at Transphorm_GaN.

About Weltrend Semiconductor Inc.

Founded in 1989 in the "Silicon Valley of Taiwan," the Hsinchu Science Park, Weltrend Semiconductor, Inc. (TWSE: 2436) is a leading fabless semiconductor company specializing in the planning, design, testing, application development, and distribution of mixed-signal/digital IC products in power supplies, motor controls, image processing, and more across multiple applications. For more information, please visit www.weltrend.com.

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Press Contact:
Heather Ailara
+1.973.567.6040
heather.ailara@transphormusa.com

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