Receiver IC Puts Wireless Charging Speeds On Par With 60-W Adapters

Renesas Electronics' P9418 is being introduced as the world's first 60-W wireless power receiver IC, enabling faster wireless charging for smartphones, laptops and notebook devices in what the company describes as the industry's highest power density solution. Featuring Renesas' WattShare technology, the highly integrated P9418 is actually both a wireless power receiver and transmitter (Fig. 1).

As a receiver, the P9418 is a single-chip solution that can deliver up to 60 W for charging a smartphone or other device. But then it also can operate as wireless power transmitter that delivers up to 10 W for charging other devices. This enables the smartphone to serve as a charging pad. The WattShare technology was originally developed by IDT, which Renesas acquired in 2019, and is already available in consumer products.

According to Amit Bavisi, vice president of Wireless Power Group, Mobility Infrastructure and IoT Power Business Division at Renesas, having a single-chip wireless power receiver that delivers 60 W brings wireless charging speeds close to that which wired 60- to 65-W adapters can deliver.

"The P9418 is the latest first-to-market example of our fast wireless charging technology, and we are proud to continue leading the way to convenient and cost-effective wireless charging for a range of mobile devices with our robust, safe and field programmable wireless power solutions," said Bavisi.

In addition to claiming the P9418 provides the highest power density solution for smartphone and mobile device charging, the company also states that it offers the best thermal performance, and best-in-class current-sense accuracy.

The P9418 builds on previous implementations of the company's WattShare technology, including the proven P9415 30-W wireless power receiver, which was introduced in 2019, and a 50-W version that began shipping last year. These products developments, in turn, built on earlier implementations of WattShare in a 15-W wireless power receiver and then in a 20-W model.

The P9418 provides an easy upgrade path for customers who are currently using the 30-W P9415 or the 50-W receiver. The P9418 also delivers advanced telemetry and proprietary charging protocols required for high-power applications.

The P9418 can be configured to receive or transmit an ac power signal through magnetic induction. When the device is configured as a wireless power transmitter, it uses an on-chip full-/half-bridge inverter, a PWM generator, a modulator/demodulator for communication, and microcontroller to produce an ac power signal to drive an external L-C tank.

As a receiver, the device receives an ac power signal from a wireless transmitter and converts it into rectified output voltage, which can be used to power devices or supply the charger input in mobile applications. The P9418 integrates a high-efficiency synchronous full-bridge rectifier and control circuitry to modulate the load to send message packets to the transmitter (Tx) to optimize power delivery.

In addition, the P9418 features an embedded 32-bit ARM Cortex-M0 processor, a best-in-class (according to the vendor) I_{OUT} current sensing accuracy for enhanced foreign object detection capabilities, MTP non-volatile memory for easy firmware and device function updates, bidirectional communications to support proprietary authentication with encryption and support for the I^2C 400-kHz standard interface and GPIOs. The IC is WPC 1.2.4 compliant and supports various proprietary charging modes (Fig. 2).

Customers can also combine the P9418 wireless charging receiver with Renesas' power management portfolio, including its USB Type-C power delivery and battery charging solutions, to accelerate the development of their applications.

The P9418 60-W wireless power receiver is available now. For more information, see the P9418 page. Or visit the wireless power page to learn more about Renesas' wireless power solutions.

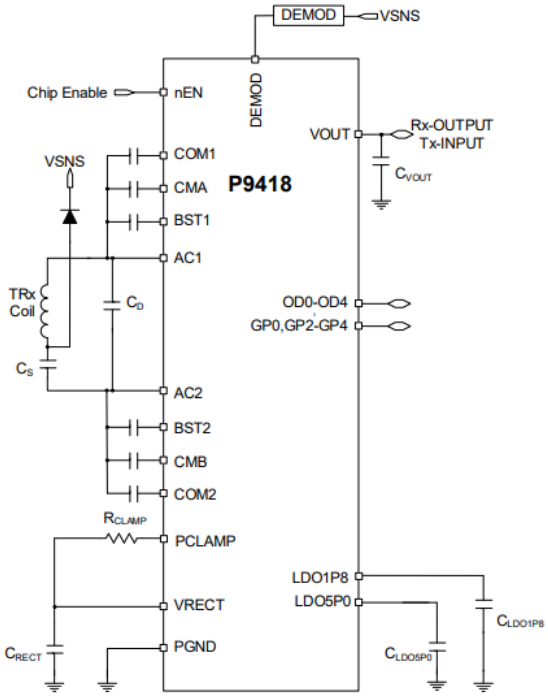

Fig. 1. Based on Renesas' proprietary WattShare technology, the P9418 is a highly-integrated single-chip wireless power transmitter/receiver IC (TRx) that can be configured to transmit or receive an ac power signal through magnetic induction. It delivers up to 60 W as a receiver, enabling what the company describes as the industry's highest power density solution. In the WattShare (TRx) mode, the chip can transmit up to 10 W for wireless charging of other devices.

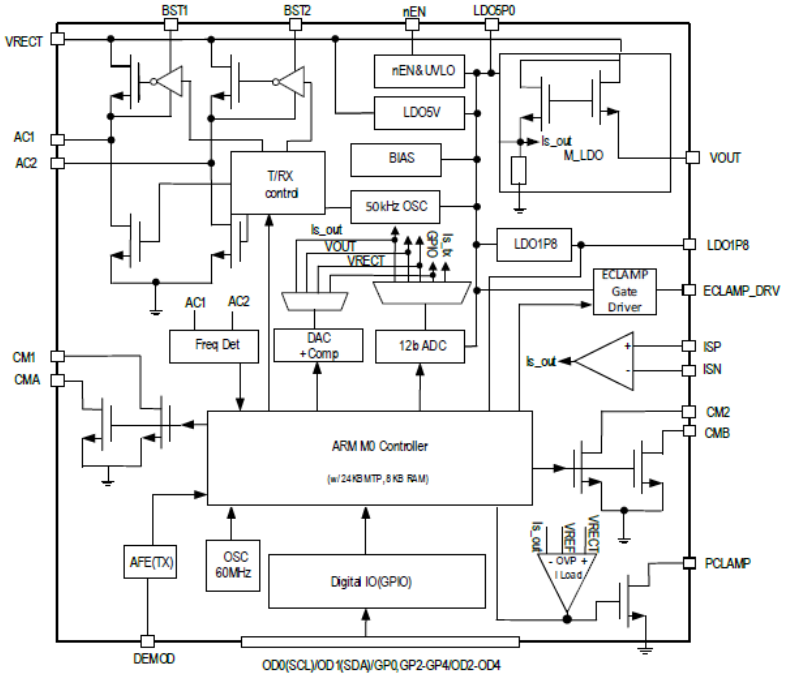

Fig. 2. As a receiver, the P9418 receives an ac power signal from a wireless transmitter and converts it into rectified output voltage, which can be used to power devices or supply the charger input in mobile applications. The chip integrates a high-efficiency synchronous full-bridge rectifier and control circuitry to modulate the load to send message packets to the transmitter (Tx) to optimize power delivery. When configured as a wireless power transmitter, the P9418 uses an on-chip full-/half-bridge inverter, a PWM generator, a modulator/demodulator for communication, and a microcontroller to produce an ac power signal to drive an external L-C tank.