

## RA9460

Wireless Power Transmitter Analog Front End IC

The RA9460 is a highly-integrated magnetic induction wireless transmitter power stage that supports over 15W of power delivery to a Qi Power Receiver (PRx), and can deliver more than 60W of power with proprietary PRx solutions. The RA9460 works seamlessly with the Renesas RA2E1 MCU family. Precision input current sensing, internal QFOD detection, and bi-directional communication provide for a secure and safe wireless charging experience.

The RA9460 includes an efficient finite state machine for configuration, execution of high-bandwidth tasks (such as Auto-ZVS and QFOD), and uses an external MCU for command and control of the RA9460's wireless power transfer. The device includes advanced wireless power circuitry such as wide input voltage range operation, high voltage coil MUX control, a phase demodulation signal generator, and auto zeroing input current monitoring. These signals are processed in the RA9460 and then sent to the host MCU's ADC for FOD, ASK Demodulation, and other tasks related to a wireless power transfer.

In addition, the RA9460 incorporates a USB BCS 1.2 PHY that supports many proprietary Travel Adapter Control Methodologies, and an I<sup>2</sup>C interface to read or send data, information, and fault conditions to the host MCU. This standard device is compliant to the WPC-1.3 specification.

The RA9460 is available in a space-saving 32-VFQFPN 4 × 4 package.

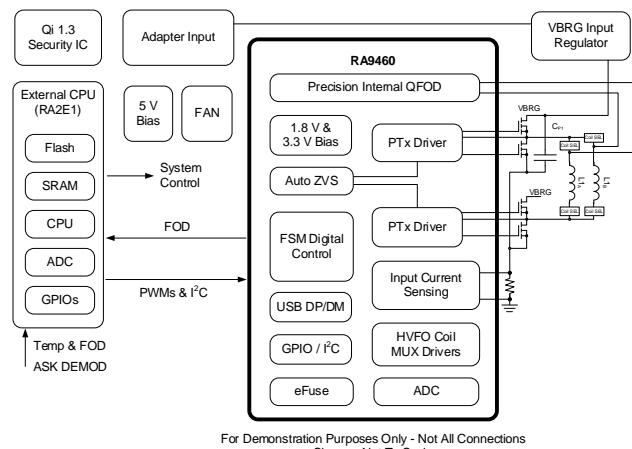


Figure 1. Simplified Application Circuit

## Features

- Power stage for Qi power transmitters
  - WPC 1.3 compliant EPP 15 W charging
  - Proprietary high-speed charging of > 60W
  - Uses external MCU for command and control
  - Recommended for use with Renesas MCU
- Qi compliant bi-directional communication
  - FSK modulation and ASK demodulation
- VIN range of 4.5V to 30V
- Two integrated half-bridge MOSFET drivers
- 4x high-voltage coil MUX control outputs
- Multiple PWM inputs for duty and phase shift operation
- ZVS optimizing MOSFET drivers for low EMI operation
- Precision input current sensing amplifier
- Current and Phase ASK demodulation outputs
- Integrated Q-FOD circuitry
  - For improved Foreign Object Detection
- System efficiency > 90% with select Renesas PRx ICs
- I<sup>2</sup>C Interface for connection Supervisor MCU
- GPIOs for temperature monitoring and system Control
- DP/DM for USB BCS 1.2+ proprietary extensions
- 3.3V LDO output for MCU power
- 5V GPIOs for TTL compatibility
- Package: 4 × 4-32-VFQFPN

## Applications

- WPC compliant wireless charging base stations
  - Charging mats or pads
  - Docking cradles
  - Generic consumer electronics
- Custom/proprietary wireless charging base stations
  - Drone/automation equipment
  - Hermetical sealed equipment and tools

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### Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

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