STWLC99

100 W Qi-compliant wireless power receiver solution

Enabling high-power charging for industrial and consumer applications

The STWLC99 is a highly integrated wireless power receiver capable of delivering an output power up to 100 W. The device is Qi 1.3 EPP compatible and supports the proprietary ST Super Charge (STSC) protocol for fast charging.

This highly efficient device allows designers to implement contactless and ultra-fast charging for high power battery-powered applications such as industrial tools and domestic appliances such as refrigerators.

KEY FEATURES AND BENEFITS

- Qi 1.3 compatible
- Up to 100 W output power
- Above 98% rectifier efficiency
- Up to 25 W output power in Tx mode (coil dependent)
- ST Super Charge (STSC) protocol for fast charging
- ARC (adaptive rectifier configuration) mode for enhanced spatial freedom
- Acccurate foreign object detection (FOD)
- On-chip thermal management and protections
- Optimized device size in WLCSP9121 package

KEY APPLICATIONS

- Fast charging smartphones
- Tablets
- Laptops
- Industrial applications
- Cordless power tools
- Power banks
- Autonomous robots
- Drones

Market-leading high-power solution

Qi wireless charging
The STWLC99 receiver IC supports the Qi 1.3 Extended Power Profile (EPP) specifications for inductive communication protocol. It can also function as a 25 W transmitter depending on the coil and enables reverse power transfer for device-to-device charging.

High efficiency
STWLC99 shows excellent rectifier efficiency performance (>98%) thanks to the integrated low-loss synchronous rectifier and the low drop-out linear regulator. Both elements are dynamically managed by the 32-bit digital core MCU to optimize efficiency by adjusting the operating point.

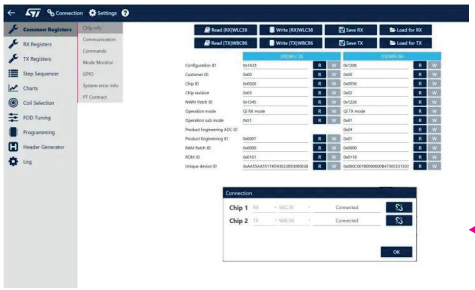
Spatial freedom
ST's proprietary adaptive rectifier configuration (ARC) mode enhances the ping-up and spatial freedom of the system in both horizontal and vertical directions without any change in hardware or coil optimization. Enabling ARC mode transforms the whole surface of the transmitter as usable charging area, which increases the ping-up distance by up to 50% in all directions.

Fast charging
STWLC99 supports the proprietary ST Super Charge (STSC) protocol that enables faster charging up to a maximum power-transfer rate of 100 W. With STSC enabled, the STWLC99 charges today's high-end smartphones with high-capacity batteries in less then 30 minutes, enhancing customer experience.

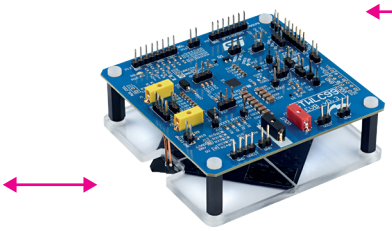
Enhanced protection
With built-in protection features, the STWLC99 has overvoltage, overcurrent and overtemperature detection circuits to prevent the chip from overheating or exceeding the Absolute Maximum Ratings (AMR) condition. Additional safety features include foreign object detection (FOD) which leverages current-sense IPs, and robust communication between transmitter and receiver.

Small footprint
The STWLC99 is housed in a wafer level chip scale package (WLCSP121) easuring 4.859 mm x 4.859 mm. Its small package size leads to reduced board size, lowering system cost.

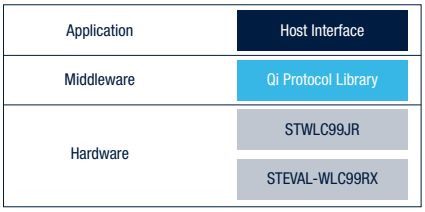
Accelerate your design-in with our complete ecosystem



STSW-WPSTUDIO GUI
Graphical user interface for wireless power receiver and transmitter



STEVAL-WLC99RX EVAL BOARD
Wireless power receiver evaluation board for 100 W applications



STSW-WLC99FW FIRMWARE
Firmware for STEVAL-WLC99RX wireless receiver evaluation kit

Supporting tools and software

Product name	Tool type	Core product	Evaluation software	Firmware
STEVAL-WLC99RX (*)	Evaluation board	STWLC99	STSW-WPSTUDIO	STSW-WLC99FW

Note (*): Evaluation board will be available Q1'2024

For technical documentation, samples and online ordering, visit us at **www.st.com/wirelesspower**