



# STWLC38

## 15 W Qi-compliant Wireless Power Receiver solution



### High efficiency & flexibility ultra-compact wireless power receiver

The STWLC38 is an integrated wireless power receiver designed to support Qi 1.3 specifications for inductive communication protocol, 5 W baseline power profile (BPP) and 15 W extended power profile (EPP). Its ultra-small form factor, makes it suitable for a wide range of wireless power solutions, from personal to industrial applications. The highly efficient chip offers a host of features, including ARC mode, an embedded 32kB RRAM, as well as chip protection features.

#### KEY FEATURES & BENEFITS

- Up to 15 W output power
- Qi 1.3 compliant
- Above 85% overall system efficiency
- Adaptive rectifier configuration (ARC) mode for enhanced spatial freedom
- 4 V to 12 V programmable output voltage
- Up to 5 W output power in Tx mode
- Configurable GPIOs
- Inbuilt I<sup>2</sup>C interface
- Foreign object detection (FOD)
- On-chip thermal management and protections
- WLCSP40 ultra-compact package

#### KEY APPLICATIONS

Optimized for small form factor solutions:

- Smartphones
- Wearables and fitness trackers
- Hearables (TWS)
- Asset tracking devices
- Medical and healthcare equipment



## STAY AHEAD WITH STWLC38

### Qi Wireless Charging

The STWLC38 receiver IC supports the Qi 1.3 15W Extended Power Profile (EPP) and 5W Baseline Power Profile (BPP). It can also perform as a 5W transmitter and allows reverse power transfer for device-to-device charging.

### High Efficiency

STWLC38 shows excellent system efficiency performance (>85%) thanks to the integrated low-loss synchronous rectifier and the low drop-out regulator. Both elements are dynamically managed by the 32-bit digital core MCU to minimize the overall power dissipation over a wide range of output load conditions.

### Ultra compact design

STWLC38 is available in an ultra-compact WLCSP-40 package to fit area sensitive solutions such as wearable and hearable devices.

### 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.

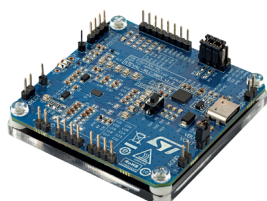
### Flexibility

STWLC38 has an embedded 32kB Resistive RAM (RRAM) which allows for multiple erase/re-write cycles. This provides flexibility for custom firmware needed for various applications such as proprietary protocols or field firmware upgrades.

### Enhanced Protection

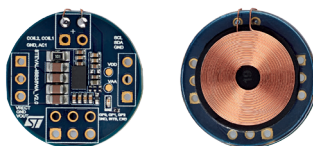
With built-in protection features, the STWLC38 has over-voltage, over-current and over-temperature detection circuits to prevent the chip from overheating or exceeding the Absolute Maximum Ratings (AMR) condition. Additional safety features include foreign object detection (FOD) which leverages current-sense IP, and robust communication between transmitter and receiver.

## Main application boards and reference designs to accelerate design-in



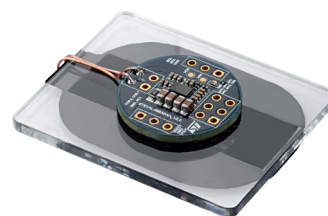
**STEVAL-WLC38RX**

Wireless power receiver evaluation board for 5 W Qi BPP and 15 W Qi EPP applications



**STDES-WLC38WA**

Ultra-compact Qi 1.3 compatible wireless power receiver reference design for 2.5 W wearable applications



**STDES-WLC38TWS**

Qi 1.3 compatible wireless power receiver reference design for 2.5 W True Wireless Stereo (TWS)

## Supporting tools and software

Evaluation tool	Category	Software	Firmware
STEVAL-WLC38RX	Application Board	STSW-WPSTUDIO Graphical user interface for wireless power receiver and transmitter evaluation	STSW-WLC38FWEPP Firmware for STEVAL-WLC38RX wireless charger evaluation kit
STDES-WLC38WA	Reference Design		STSW-WLC38FWBPP Firmware for STDES-WLC38WA and STDES-WLC38TWS wireless charger reference designs
STDES-WLC38TWS	Reference Design		

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