

# Near Field WattUp<sup>®</sup> Wire-Free Charging

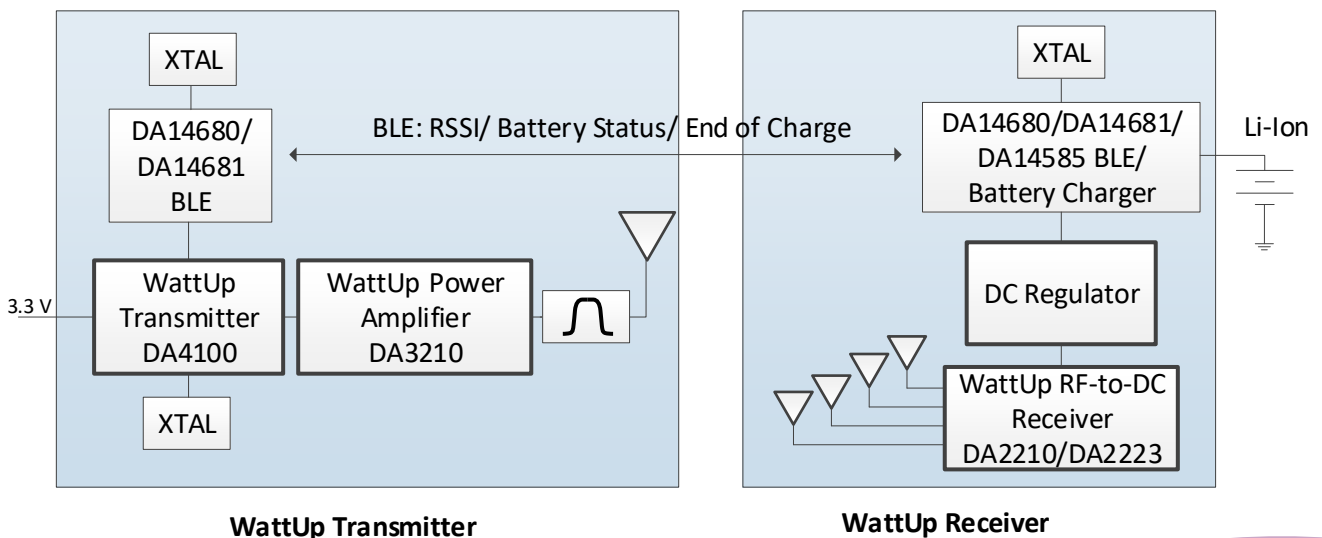
## Ultra-small, location-flexible, RF charging solution for wearables, hearables and low-power electronics

Near Field WattUp RF-based charging provides an ultra-small wireless charging solution, expanding wireless charging into wearables, hearables and other low-power devices, which are challenged to include wireless charging due to large coil size required by coil-based designs. WattUp also provides greater placement freedom while charging, supporting non-flat surfaces and 90° charging, compared to coil-based charging systems which require very tightly coupled designs, as well as superior Foreign Object Detection (FOD) and thermal performance. Multiple devices can charge from the same transmitter, with ability to scale to high power.

The Near Field WattUp transmitter represents the smallest and lowest cost transmitter option. The Near Field WattUp transmitter design is intended to be an in-box solution for many small electronics, ultimately replacing the USB cable and power adapter typically included in the box. The solution provides the convenience and waterproofing benefits of wireless charging without significantly affecting the overall BOM cost. The Near Field WattUp transmitter technology can be embedded into laptops, game consoles, furniture, automotive, other devices or as a stand-alone transmitter.

The Near Field WattUp system is comprised of a WattUp wireless power transmitter (DA4100), a WattUp wireless power amplifier (DA3210), a WattUp wireless power receiver (DA2210 or DA2223), a DC regulator, a Li-Ion/Li-Poly battery charger and an optional Bluetooth<sup>®</sup> communication link (DA14680, DA14681 or DA14585) which supports battery status communication between the WattUp receiver and transmitter. The same link can be used to provide the user with full power management capabilities using the WattUp Application running on a Smartphone or tablet. Antennas are fabricated using low-cost PCB material, flexible PCB or sheet metal.

### Near Field WattUp System Block Diagram





### DA4100 WattUp Wireless Power Transmitter SoC

DA4100 is a fully integrated WattUp power transmitter IC which operates directly from 3.3V and only requires an external crystal, power amplifier and transmit antenna to complete a Near Field WattUp power transmitter design.

### DA3210 WattUp Wireless Power Amplifier

DA3210 is a single channel high efficiency power amplifier. With gain adjustable through an SPI compatible serial interface, input and output power detectors that enable closed loop power control and an integrated temperature sensor, DA3210 is optimized for the WattUp wireless power transmitters and completes the Near Field WattUp power transmitter system.

### DA2210/DA2223 WattUp Wireless Power RF-to-DC Receivers

DA2210 and DA2223 are wireless power RF-to-DC receivers which can be connected to 1 to 4 antennas. Antennas can be small enough to fit into in-the-ear hearing aids. With a form factor smaller than DA2210, DA2223 is ideal for use in very small electronic devices, thus offering further flexibility in integration.

### DA14680/DA14681/DA14585 SmartBond Bluetooth SoCs

DA14680 (internal FLASH), DA14681 (external FLASH) and DA14585 (external FLASH, no charger) are Bluetooth Low Energy SoCs and provide a link between the WattUp transmitter and receiver as well as a communication link to a phone where battery status information can be shared to give a complete system solution.



### Applications

- Fitness Bands
- Hearables
- Hearing Aids
- Bluetooth Headsets
- Bluetooth Trackers
- Smart Pens
- Remote Controls
- Smart Glasses

### Key benefits

- Ultra-small RF/antenna-based solution
- Improved spatial and orientation freedom
- Secure pairing of the transmitter and device-under-charge
- Eliminates connectors and charging contacts
- Enables fully sealed waterproof design

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