Highest Efficiency, Qi-Certified Wireless Power Solutions using Power Application Controller (PAC)™ IC Family

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### PAC52xx Product Family

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Notes: DIFF-PGA = differential programmable gain amplifier, GD = gate driver, HS = high-side, LS = low-side, OD = open-drain driver, PGA = programmable gain amplifier. UHV = ultra-high-voltage.

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PAC5220WP - For Qi-Certified Wireless Power Applications
Power Application Controller™

**SERIAL INTERFACE**
- SPI, I²C, UART

**PWM ENGINE**
- 4 16-bit timers, 14 channels, HW dead-time control, 10ns resolution control

**MULTI-MODE POWER MANAGER**
- AC/DC, DC/DC, PFC, 4 linear regulators

**50MHz ARM CORTEX-M0 MICROCONTROLLER CORE & MEMORY**
- 1-cycle 32-bit multiplier, 24-bit RTC, 24-bit WDT, 24-bit SysTick, NVIC, up to 32kB FLASH & 8kB SRAM

**APPLICATION SPECIFIC POWER DRIVERS**
- HV/UHV gate drivers, HV/MV open-drain drivers

**DATA ACQUISITION & SEQUENCER**
- 10-bit 1µs ADC, dual auto-sampling sequencer

**CONFIGURABLE ANALOG FRONT END**
- 3 differential PGAs, 4 single-ended PGAs, 10 comparators, 2 DACs (10-bit & 8-bit), temperature monitor

- Industry-leading 32-bit ARM Cortex™ M0 processor with patented smart peripherals
- Patented all-in-one power conversion solution
- First-in-market integrated high voltage power drivers up to 600V operation
- Sophisticated yet easily configurable analog frontend
- Proven analog array methodology allows quick silicon spins
Sample Applications

- Wireless Charging Solutions
- Power Converter Applications (UPS, Solar micro-inverters, Offline power etc.)
- Motor Control Applications (VFD, Offline BLDC, Dual motor Control with PFC etc.)
- LED Driver and Control Applications
- Others (that need MCU, H or half-bridge, sensing, fault protection, etc.)
PAC5220WP Based Wireless Power Transmitter Solutions

Qi 1.1.2 Certified

A11 Type 5V USB Wireless Charger

A1/A10 Type Wireless Charger

A11 Type Automotive Wireless Charger

A6 Type Wireless Charger
Examples of Wireless Charging Applications
Active-Semi’s PAC5220WP Offers Single-IC Solution For Wireless Charging Replacing 6+ Discrete ICs Required with Competitive Solutions
Industry’s Highest Efficiency, Qi-Certified USB Wireless Charger

- Qi Version 1.1.2 Certified Turnkey Solution for 5V USB Wireless Power Transmitter based on PAC5220WP IC
- Industry’s highest transfer efficiency up to 75%
- Industry’s lowest standby power of under 50mW
- Lowest BOM Cost Solution with fewer components Preloaded WPC firmware
- PAC5220WP and Solution Kit in Production now

In Production
Order IC Samples/ EVK Now

EVK-PAC5220QS-Qi-xxA11-V1

(xx = HP for High-performance
Xx = LC for Lowest-cost version)

For more info, visit www.active-semi.com/wirelesspower
PAC5220WP System Block Diagram
Showing Powering from DC input

Up to 3 Half H-Bridges

PAC5220WP System Block Diagram
Showing Powering from Universal AC input

Up to 3 Half H-Bridges
PAC52xx ICs can also support offline power management (without need for additional ICs), and eliminate the need for External AC adapter
• AC line operated type A1 or A10 charger solution
• Integrated off-line flyback regulator generates 19V
• ½-H-bridge coil driver (using Application-Specific Power Drivers)
• Reference design integrates an alarm clock with LCD display
A11 Type Automotive Charger with Wide input

- Supports
- Integrated buck converter generates 5VDC from wide 8V-40V input supply
- Full H-bridge coil driver (using Application-Specific Power Drivers)
- Tiny 2” x 2” PCB [50mm x 50mm]
A6 Type 3-coil Charger with 12VDC input

- 12VDC powered type A6 (3-coil or 1-coil) charger solution
- No additional power supply components needed
- Three ½-H-bridge coil drivers (using Application-Specific Power Drivers), one for each coil
- Also can use a single type A6 coil
Qi-Certified Firmware for 5V USB Powered Devices

- Supports Wireless Power Transfer Specification
  - Version 1.1.2
  - Low-Power (5W)
- Wireless Power Transfer features:
  - Digital Ping
  - Device ID and Configuration
  - Power Transfer
- Wireless Receiver Communication Decoder
- Wireless Receiver Status Detection:
  - Fully-charged batteries
  - Error conditions such as Over-voltage, battery failure, etc.
- Foreign Object Detection (FOD)
- Guided Positioning
Summary - Active-Semi Wireless Power Value Proposition

- Hardware & Firmware with Latest 1.1.2 version certification
- PAC5220WP based single-IC design for power management, control, power transfer & safety
- Industry’s highest efficiency of 75%
- Industry’s lowest standby power
- Industry’s Smallest footprint and lowest BOM cost solution
- Customizable features for performance, LEDs, buzzer etc.
- **Scalable single-IC solution** for WPC, PMA, multi-coil, and medium/high power levels up to 150W

For Samples and Solution Kits, consult your local distributor, or email sales@active-semi.com

Visit www.active-semi.com for more info and list of distributors

Thank you