active-semi™
Solutions for Sustainability

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

Mar 2014

active-semi™
Solutions for Sustainability

PAC52xx Product Family

PART #	PIN	POWER MANAGER		CONFIGURABLE ANALOG FRONT END					APPLICATION SPECIFIC POWER DRIVERS			MICRO-CONTROLLER		PRIMARY APPLICATION
		INPUT VOLTAGE	MULTI-MODE SW	DIFF-PGA	PGA	COMPARATOR	DAC	ADC CHANNEL	POWER DRIVER	PWM CHANNEL	FAULT PROTECT	GPIO	INTERFACE	
PAC5210	56-pin 8x8 TQFN	5-54V	Y	3	4	10	2	11	3 OD (24V/50mA)	14 GPIO	Int + 2 Ext	36	SPI I^2C UART SWD	IPM control or general purpose control
PAC5220WP	56-pin 8x8 TQFN	5-54V	Y	3	4	10	2	11	3 LS (1A/1A) 3 HS (1A/1A) 2 OD (40V/50mA)	6 GD 6 GPIO	Int	28	SPI I^2C UART SWD	Wireless Power Transmitter/Charger
PAC5220	56-pin 8x8 TQFN	5-54V	Y	3	4	10	2	11	3 LS (1A/1A) 3 HS (1A/1A) 2 OD (40V/50mA)	6 GD 6 GPIO	Int	28	SPI I^2C UART SWD	3 half bridge, 3-phase control
PAC5250	57-pin 10x10 TQFN	5-600V	Y	3	4	10	2	9	6 LS (1A/1A) 3 HS (0.25A/0.5A) 2 OD (24V/50mA)	9 GD 5 GPIO	Int + Ext	25	SPI I^2C UART SWD	UHV 3 half bridge, 3-phase control
PAC5260	56-pin 8x8 TQFN	5-54V	Y	4	2	2	2	12	4 LS (0.25A/0.5A) 4 HS (0.25A/0.5A)	8 GD 3 GPIO	Int	15	SPI I^2C UART SWD	4 half bridge 2 H-bridge control

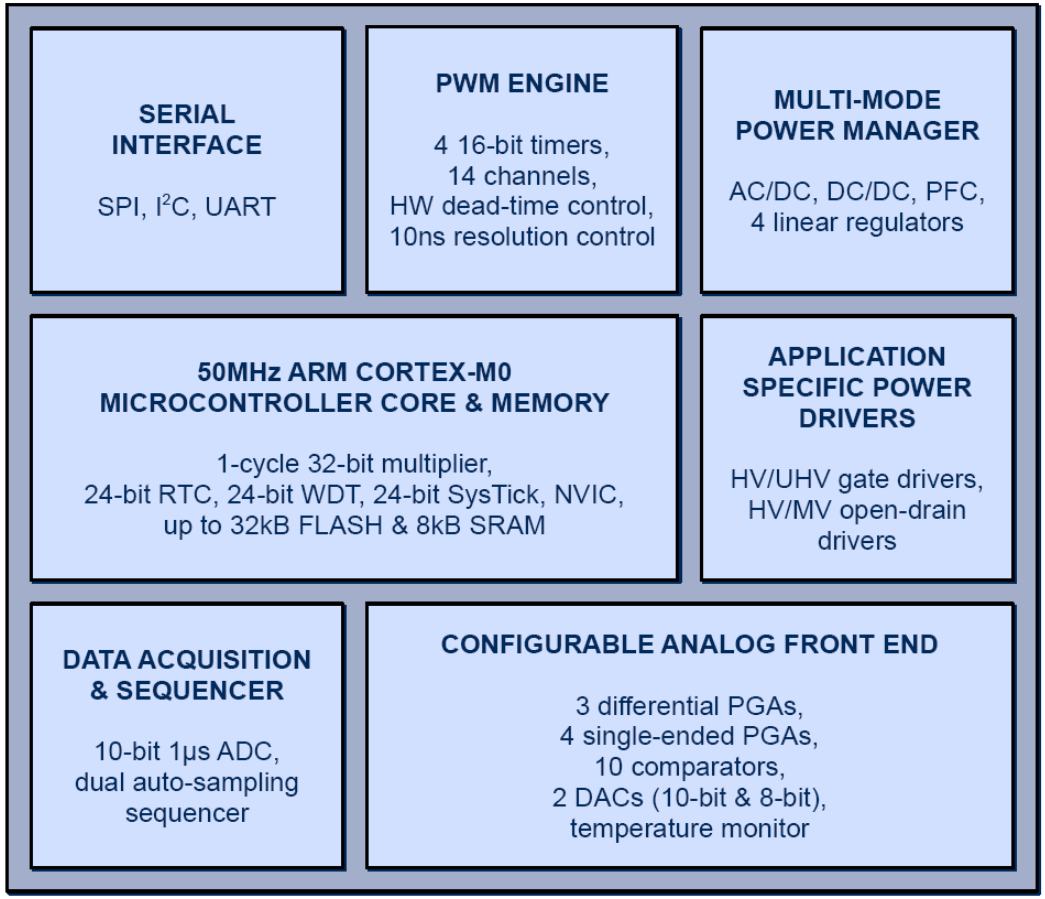
PAC5220WP - For Qi-Certified Wireless Power Applications

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.

active-semi™
Solutions for Sustainability

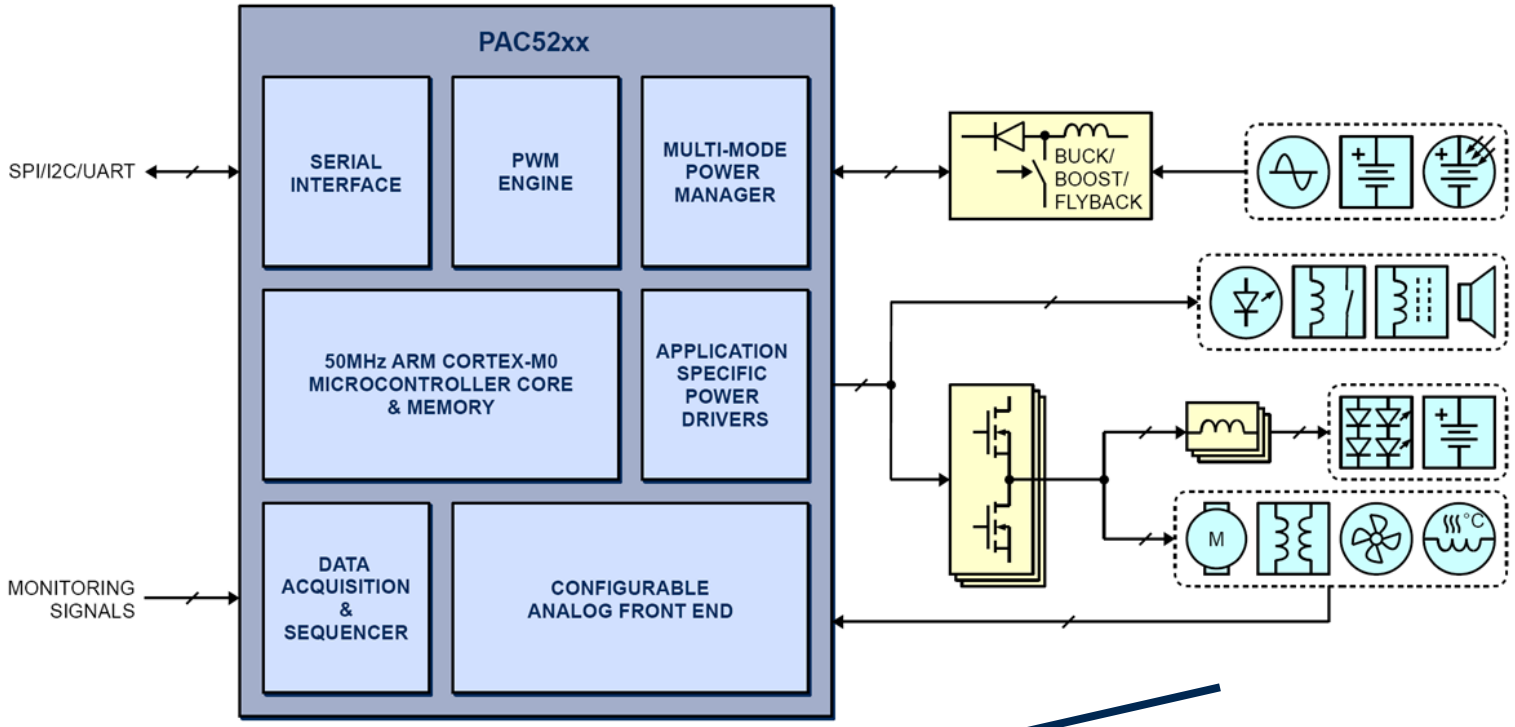
Power Application Controller™

PAC52xx IC Block Diagram



- 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

PAC System Hook-up



Sample Applications

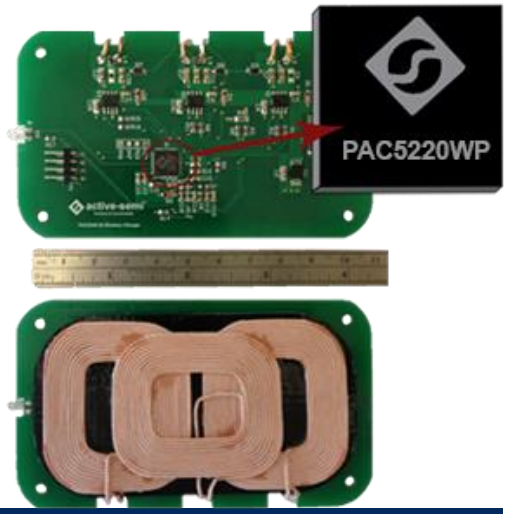
- Wireless Charging Solutions
- Power Converter Applications (UPS, Solar micro-inverters, Offline power etc.)
- Motor Control Applications (VFD, Offline BLDC, Dual motor Control with PFC etc.)
- LED Driver and Control Applications
- Others (that need MCU, H or half-bridge, sensing, fault protection,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

PAC5220WP Based Wireless Power Transmitter Solutions

A11 Type 5V USB Wireless Charger

A1/A10 Type Wireless Charger

A11 Type Automotive Wireless Charger



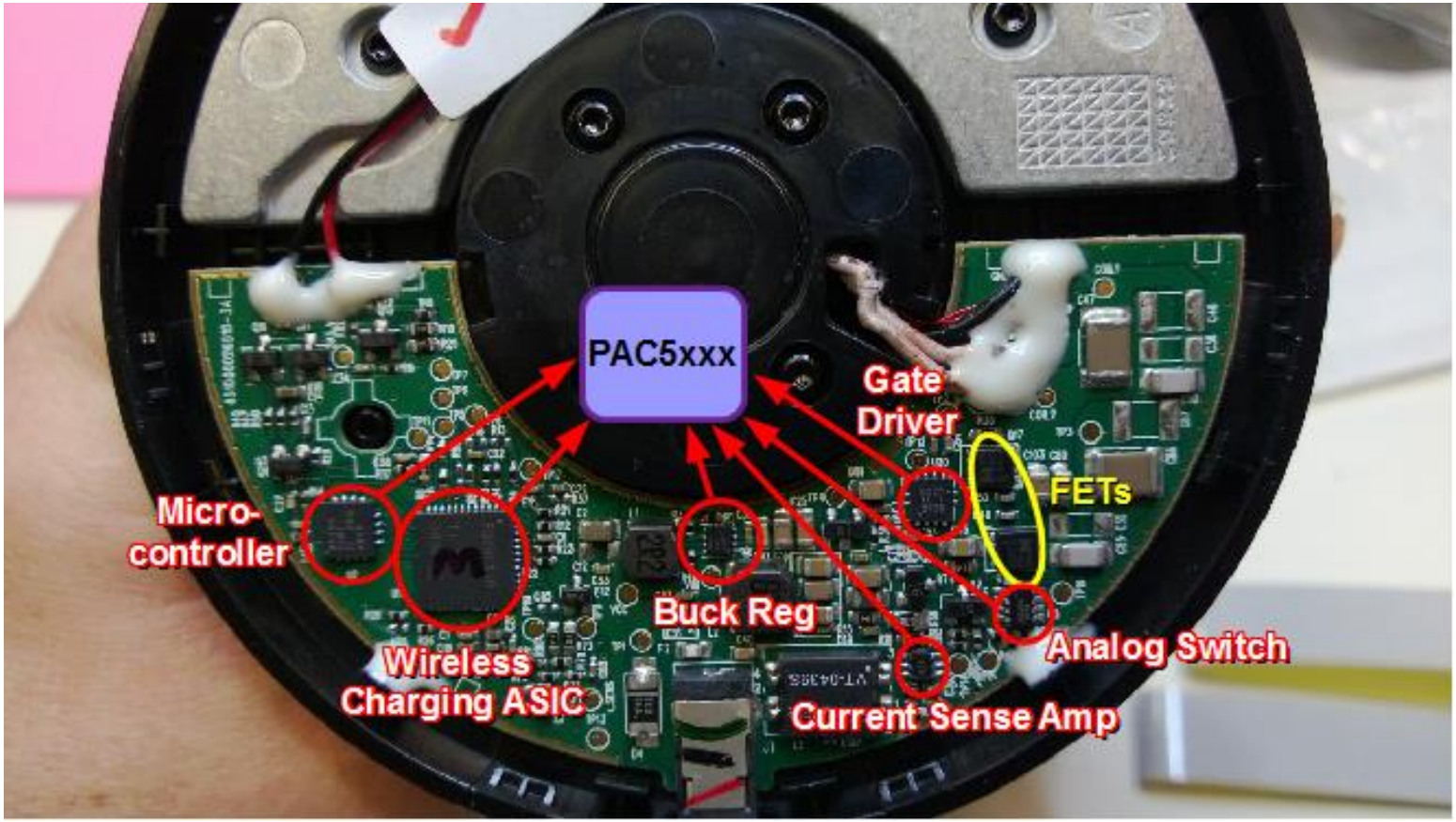
A6 Type Wireless Charger

active-semi™
Solutions for Sustainability

Examples of Wireless Charging Applications

active-semi™
Solutions for Sustainability

Typical Discrete ICs Solution vs Active-Semi's Single IC Solutions

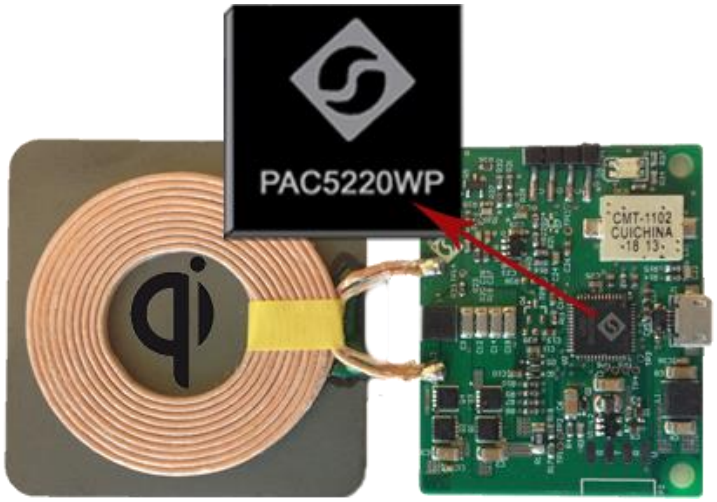


Active-Semi's PAC5220WP Offers Single-IC Solution For Wireless Charging Replacing 6+ Discrete ICs Required with Competitive Solutions

Industry's Highest Efficiency, Qi-Certified USB Wireless Charger

Qi 1.1.2 Certified

- 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
- Evaluation kit (EVK) User Guide, Schematics, Layout drawings and BOM
- PAC5220WP and Solution Kit in Production now



EVK-PAC5220QS-Qi-xxA11-V1

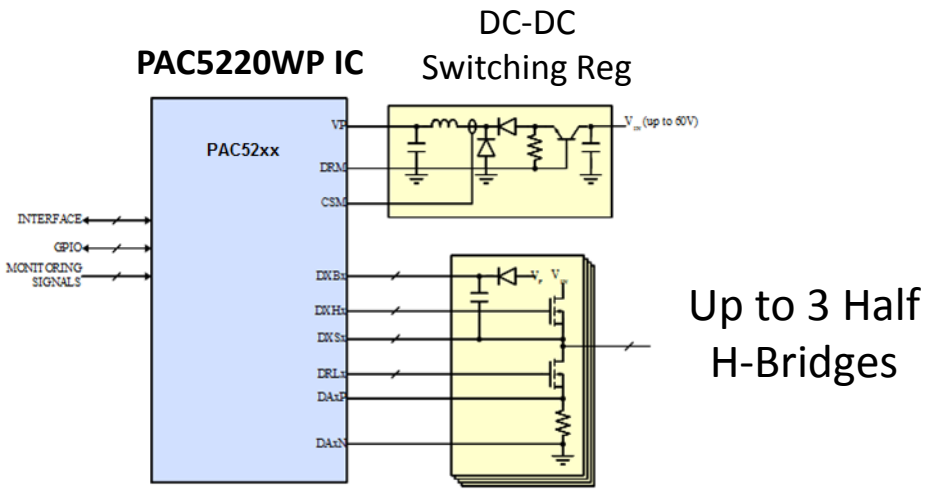
(xx = HP for High-performance
Xx = LC for Lowest-cost version)

In Production
Order IC Samples/ EVK Now

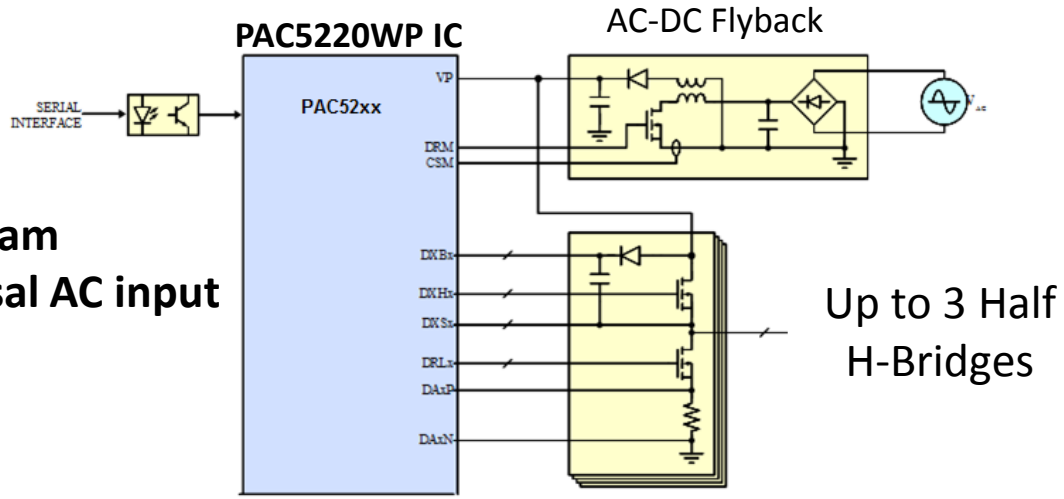
For more info, visit www.active-semi.com/wirelesspower

PAC520WP DC-DC and Universal AC Input Power Configurations

PAC5220WP System Block Diagram Showing Powering from DC input



PAC5220WP System Block Diagram Showing Powering from Universal AC input



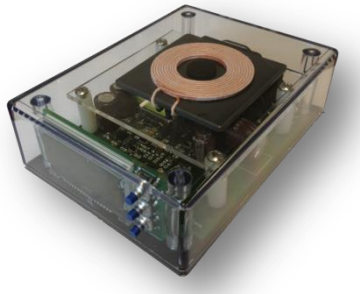
active-semi™
Solutions for Sustainability

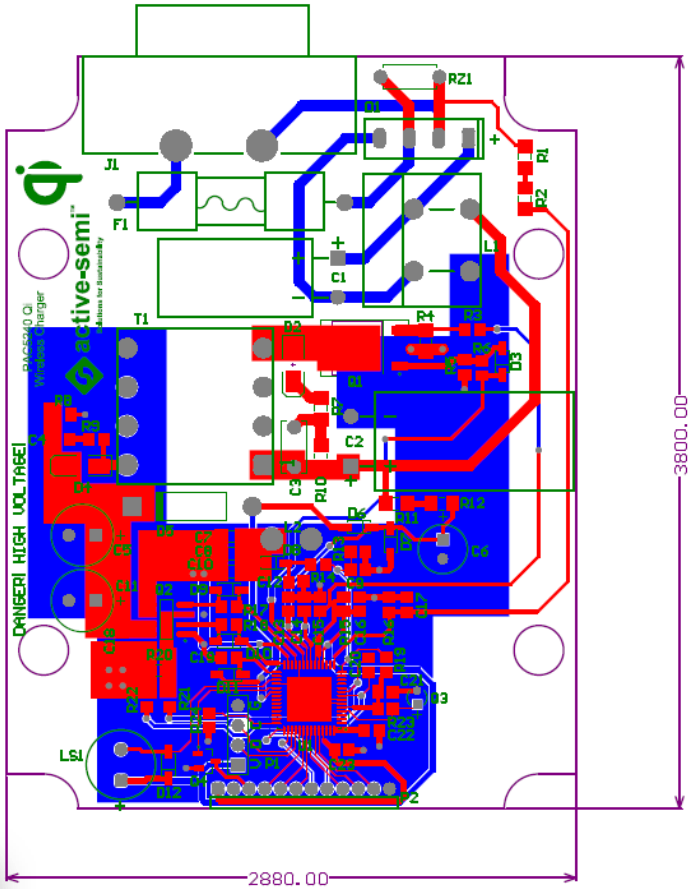
Existing Solution – External Adapter

PAC52xx ICs can also support offline power management (without need for additional ICs), and eliminate the need for External AC adapter

A1/A10 Type Charger with Offline Flyback

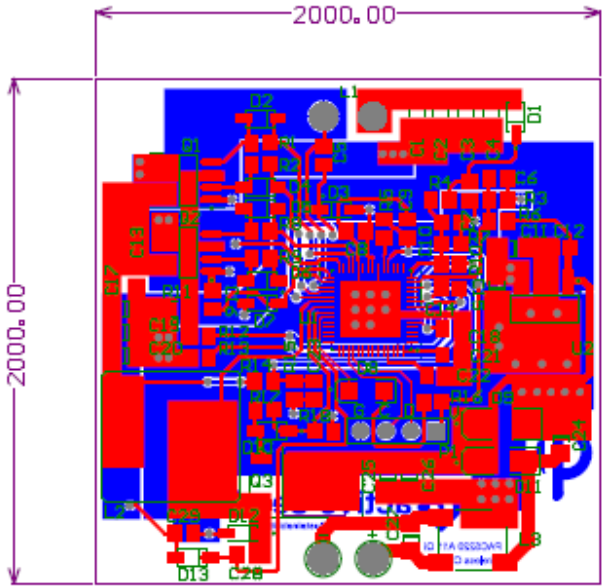
- AC line operated type A1 or A10 charger solution
- Integrated off-line flyback regulator generates 19V
- ½-H-bridge coil driver (using Application-Specific Power Drivers)
- Reference design integrates an alarm clock with LCD display





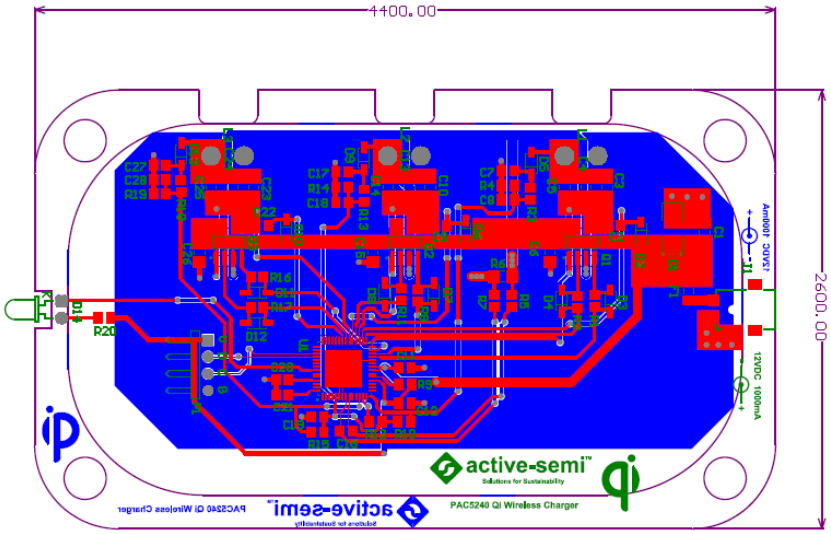
A11 Type Automotive Charger with Wide input

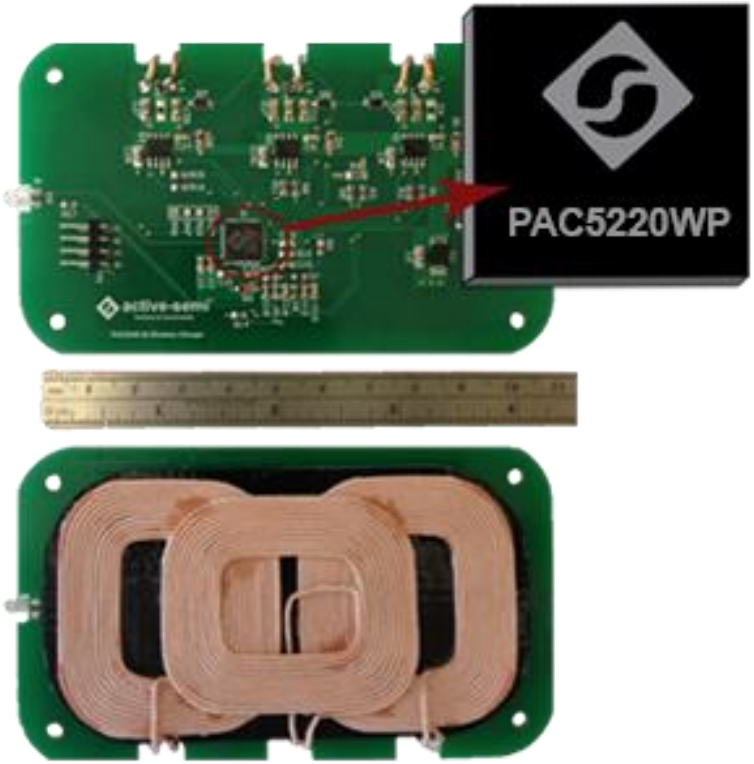
- Supports
- Integrated buck converter generates 5VDC from wide 8V-40V input supply
- Full H-bridge coil driver (using Application-Specific Power Drivers)
- Tiny 2” x 2” PCB [50mm x 50mm]



A6 Type 3-coil Charger with 12VDC input

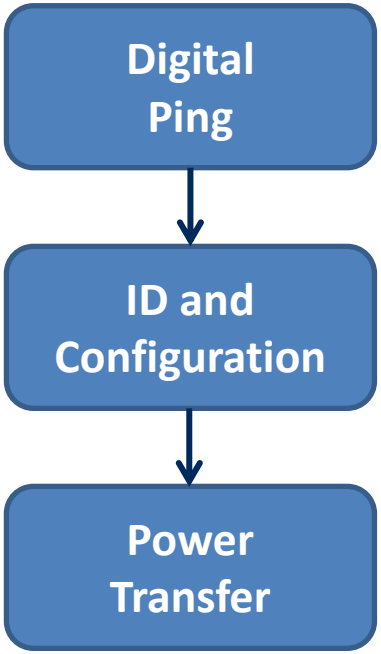
- 12VDC powered type A6 (3-coil or 1-coil) charger solution
- No additional power supply components needed
- Three ½-H-bridge coil drivers (using Application-Specific Power Drivers), one for each coil
- Also can use a single type A6 coil





Qi-Certified Firmware for 5V USB Powered Devices

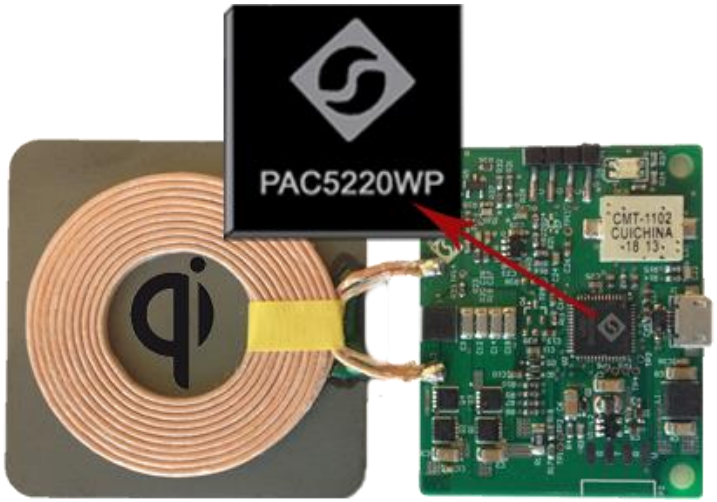
- Supports Wireless Power Transfer Specification
  - Version 1.1.2
  - Low-Power (5W)
- Wireless Power Transfer features:
  - Digital Ping
  - Device ID and Configuration
  - Power Transfer
- Wireless Receiver Communication Decoder
- Wireless Receiver Status Detection:
  - Fully-charged batteries
  - 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

More details on the wireless power solutions at www.active-semi.com/wirelesspower



active-semi™
Solutions for Sustainability

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