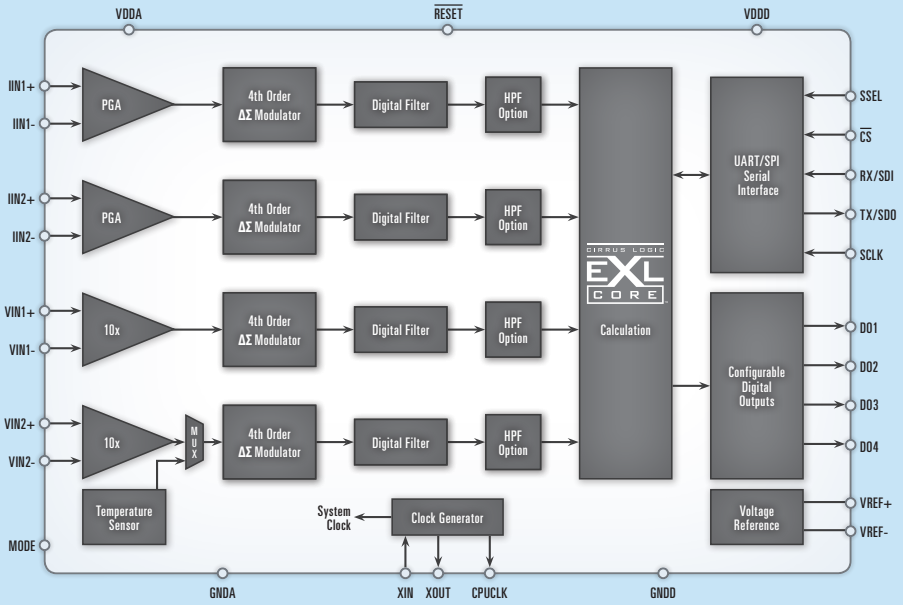
Four Channel Energy Measurement IC

CS5484/80/90

Market Applications

- Utility Meters
- Power Supply Monitoring
- Smart Appliances
- Home Energy Management
- Emerging Smart Home and Smart Grid Applications



For manufacturers of utility meters, appliances and smart home energy solutions, Cirrus Logic's CS5484/80/90 family of analog front end (AFE) energy measurement ICs provide the industry's highest measurement accuracy and lowest cost, with the flexibility and ease of use to react quickly to rapidly changing market conditions.

The CS548/9X family, when combined with an MCU of your choice, offers a clear alternative to system-on-a-chip solutions, whose "one size fits all" approach limits the designers ability to optimize the design for performance and cost requirements.

With an energy measurement accuracy of 0.1% over 4,000:1 dynamic range, the CS548/9X family offers superior measurement performance with no user programming required, and ultra-fast calibration. Its multiple interface options, including UART, SPI and four digital outputs, provide flexibility to quickly react to changing market requirements. Plus, each digital output is individually configurable to provide energy pulses, zero crossing, energy direction or interrupt functions on any of the provided pins.

Features:

- Superior analog performance with ultra low noise level and high SNR
- Energy measurement accuracy of 0.1% over 4000:1 dynamic range
- Current RMS measurement accuracy of 0.1% over 1000:1 dynamic range
- 2, 3 or 4 independent 24-bit, 4th-order Delta Sigma modulators for voltage and current measurement
- Configurable digital outputs for energy pulses, zero crossing or energy direction
- Supports shunt resistor, CT and Rogowski coil current sensors
- On-chip measurements / calculations:
  - Active, reactive and apparent power
  - RMS voltage and current
  - Power factor and line frequency
  - Instantaneous voltage, current and power
  - Overcurrent, voltage sag and voltage swell detection
- UART / SPI serial interface options
- Internal register protection via checksum and write-protection
- On-chip voltage reference (25 ppm/°C typ.)
- Single 3.3V power supply
- Low power consumption: <13mW
- Small, low cost package options

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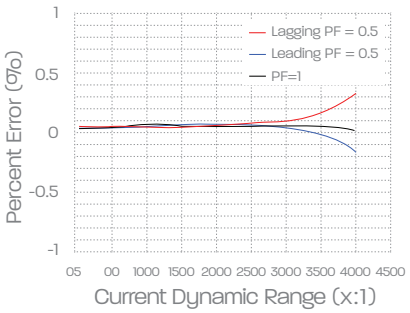
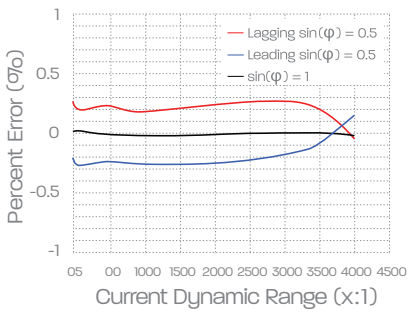
Electrical Specifications

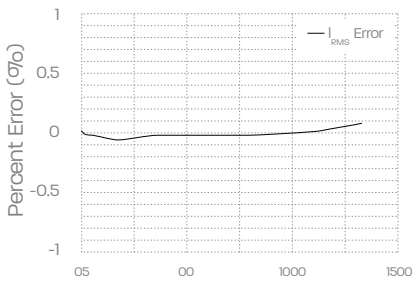
Active Energy Accuracy



Reactive Energy Accuracy

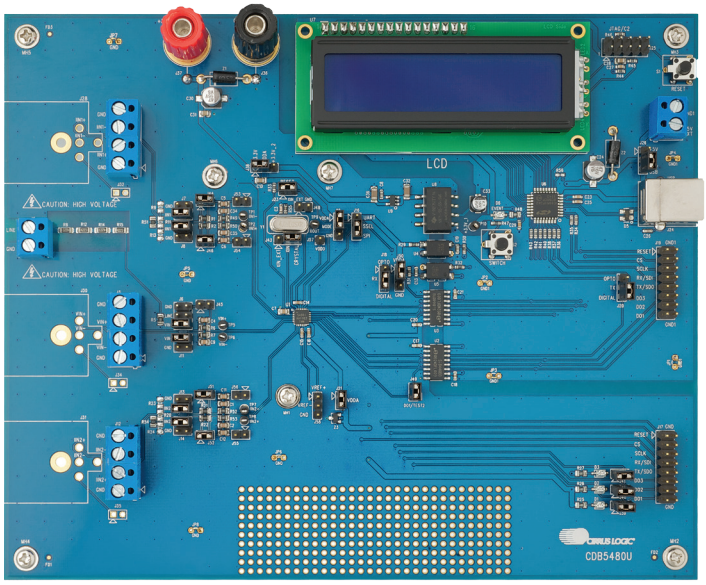


I_{RMS} Accuracy



AFE + MCU Advantage vs Using SOCs

- Pre-programmed industry standard power calculations saves money and accelerates production schedules and time to market
- Up to 10X faster calibration
- Pair Cirrus Logic AFE with cost-optimized microcontroller tailored to the demands of the application
- Lock in AFE for metrology and easily change MCU to quickly adapt to changing market requirements
- Never pay for more memory, IO or performance than required



Demonstration Board

The CDB5484/80/90U is an extensive tool designed to evaluate the functionality and performance of the Cirrus Logic CS5484/80/90 family. Shunt resistors, current transformers or Rogowski coils can be connected to the analog inputs. Intuitive GUI software provides easy and full access to the on-board CS5484/80/90 device and MCU. On-board LEDs and LCD displays enable stand alone operation for extended testing. Getting started with a CDB enables fast and easy preliminary evaluation of Cirrus Logic's AFE products.

Part	CS5484	CS5480	CS5490	CS5467	CS5464	CS5463	CS5451A
ADC Converters	4	3	2	4	3	2	6
Current Sensor Options	Shunt/CT/Rogowski	Shunt/CT/Rogowski	Shunt/CT/Rogowski	Shunt/CT	Shunt/CT	Shunt/CT	Shunt/CT
Active Energy Accuracy	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	N/A
Reactive Energy Accuracy	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.2% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	N/A
I_{RMS} Accuracy	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	0.1% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	N/A
SNR	80dB	80dB	80dB	78dB	78dB	78dB	77dB
Serial Communication	SPI/ UART	SPI/ UART	UART	SPI	SPI	SPI	SPI
Digital Outputs	4x Configurable Outputs	3x Configurable Outputs	Single Configurable Output	Energy Pulses	Energy Pulses	Energy Pulses	—
V_{REF} Drift	25ppm/C	25ppm/C	25ppm/C	40ppm/C	40ppm/C	40ppm/C	25ppm/C
Input Voltage	3.3V	3.3V	3.3V	5V Analog 3.3/5V Digital	5V Analog 3.3/5V Digital	5V Analog 3.3/5V Digital	3V Analog 3V Digital
Power Consumption	<13mW	<13mW	<13mW	25mW	25mW	21mW	23mW
Package	28 QFN	24 QFN	16 SOIC	28 SSOP	28 SSOP	24 SSOP	28 SSOP

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