

● INTEGRATED POWER MONITORING - THE FUTURE OF SMARTER HOMES

ACS37800: Single Phase, Isolated, AC/DC Power Monitoring IC

Smart lighting. Appliances. Blinds. Doors and gates.

Growth in the home automation industry has been turbocharged in recent years as consumers adopt new technologies—and continually expect more intelligence and energy efficiency from their smart homes. But that intelligence and efficiency require accurate and safe electrical monitoring of our most power-hungry devices, including the voltage, current, and power they use.

For the first time, it's possible with a single, space-saving IC—Allegro's ACS37800.

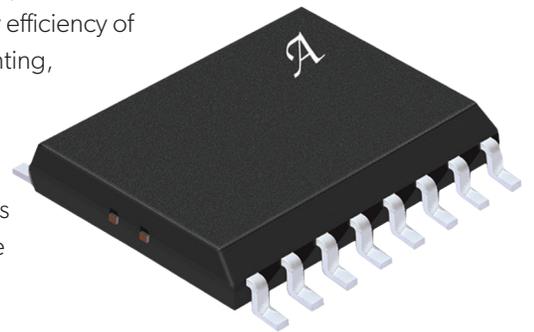
The ACS37800 is an integrated, single-phase AC and DC power monitoring chip that simultaneously monitors power, voltage, and current up to 180A with a reinforced isolation rating of up to 517Vrms. This IC allows smart devices to easily track power consumption and optimize energy use and detect reduced motor efficiency to allow for predictive maintenance.

Alternative power monitoring solutions with high isolation levels similar to the ACS37800 are typically expensive and require significant board space. In a tiny SOIC16 package, this IC reduces both PCB cost and size by eliminating the need for components like current sense resistors, opto-isolators, dual-output supplies, regulators, and comparators.

The ACS37800 provides both instantaneous and RMS measurements for the current, voltage, and power which simplifies common power measurements like the active, reactive, and apparent power by reducing the processing cycles required from the MCU and time to market.

Thanks to impressive flexibility and configurability, users can program the ACS37800 to fit unique application needs. The device allows designers to choose from an I²C or SPI interface, and with zero crossing detection (ZCD) in I²C mode, LED dimming control is easy. Users can also program thresholds for over/under-voltage, current/voltage gain and offset, as well as the overcurrent trip points.

Thanks to its magnetic and non-contact current sensing, as well as a low 0.85mΩ internal conductor resistance value, Allegro's ACS37800 offers its customers the capability to easily monitor and optimize the energy efficiency of power supplies, lighting, and motor control sub-systems in connected building automation solutions while simplifying the system design.

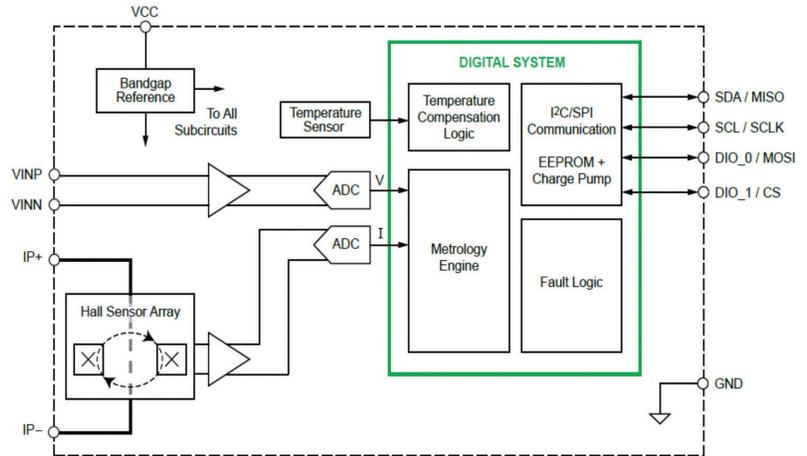


Features and Benefits

- 0 to 90A current range (up to 180 with lower accuracy)
- Precise current, voltage and power measurements with capability to average over a full period
- Wide temperature range: -40 to +125°C
- 3.3 and 5V
- Supports I²C and SPI interfaces
- Overcurrent fault output pin for fast response time (5 μs)
- Current or Voltage Zero Crossing output particularly useful for light dimming and motor control
- Low primary conductor: 0.85mΩ
- High isolation: 517Vrms reinforced isolation, 1047Vrms working voltage and 4.8kVrms dielectric
- Bandwidth: 1kHz

Applications

- **IoT Building Automation**
(smart appliances, smart plug and receptacles, smart lighting)
- **Motor Control**
- **Power Supplies**
(data center servers and telecom)



ACS37800 Selection Guide

Allowing 5 and 3.3V options, choosing between I²C and SPI, and multiple different sensitivity options.

Part Number	V _{CC} (NOM) (V)	I _{PR} (A)	Communication Protocol	T _A (°C)	Packaging
ACS37800KMABTR-015B5-SPI	5	+/-15	SPI	-40 to +125	Tape and Reel, 1,000 pieces per reel, 3,000 pieces per box
ACS37800KMABTR-030B3-SPI	3.3	+/-30			
ACS37800KMABTR-030B3-I2C	3.3	+/-30	I ² C		
ACS37800KMABTR-090B3-I2C	3.3	+/-90			

Makes LED Dimming Control Easy

LED dimming requires AC line zero crossing detection (ZCD) to synchronize control circuitry. ZCD is used to prevent lamp flickering when dimming.

Voltage Zero Crossing Modes

