Low Noise Amplifier with Low Output Impedance for Use with PCB-Based di/dt Sensors

FEATURES

- Single-supply operation: 2.97V to 3.63V
- Three configurable gain options
  - Av setting = 40 (actual gain = 39.67)
  - Av setting = 62 (actual gain = 62.04)
  - Av setting = 86 (actual gain = 86.4)
- Low noise
  - 7.6nV/√Hz at f = 45Hz to 65Hz, at Av setting = 40 (39.67)
  - 6.9nV/√Hz at f = 45Hz to 65Hz, at Av setting = 62 (62.04)
  - 6.4nV/√Hz at f = 45Hz to 65Hz, at Av setting = 86 (86.4)
- Integrated temperature sensor
- Low output impedance (powered on) 1.1Ω at 50Hz

APPLICATIONS

- Single-phase energy meters
- Polyphase energy meters
- Split-phase energy meters
- Power quality monitoring
- Protective devices
- Smart breakers
- Electric vehicle (EV) chargers
- Machine health
- Smart power distribution units

PIN CONNECTION DIAGRAM

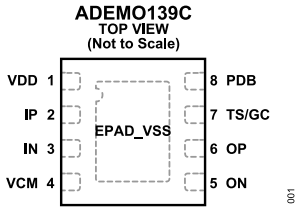

Figure 1. ADEMO139C Pin Configuration, 8-Lead LFCSP

GENERAL DESCRIPTION

The ADEMO139C is a low drift, low output impedance, fully differential, programmable-gain amplifier designed for use with a PCB-based di/dt current sensor and the ADEMA12x 4-channel and 7-channel ADC. An output common-mode (CM) voltage of 1.2V and supply voltage of 3.3V allows direct connection to ADEMA12x ADC.

The ADEMO139C has high gain, low noise, and excellent common-mode rejection ratio (CMRR) and power-supply rejection ratio (PSRR) specifications, which make it ideal for high accuracy energy measurement applications. The ADEMO139C is specified over the extended industrial temperature (−40°C to +125°C) and is available in an 8-lead LFCSP.

The low output impedance of the ADEMO139C allows the amplifier and ADC to be placed on separate boards connected by a cable. Compared to ADEMO139A, the ADEMO139C has 1.5× higher gain across all gain settings and a 1.5× wider output range.

For more details on the ADEMO139C, contact the local Analog Devices, Inc., sales office at www.analog.com/sales.

NOTES