

Brief Description

The ZSC31010 is a sensor signal conditioner integrated circuit, which enables easy and precise calibration of resistive bridge sensors via EEPROM. When mated to a resistive bridge sensor, it will digitally correct offset and gain with the option to correct offset and gain coefficients and linearity over temperature. A second-order compensation can be enabled for temperature coefficients of gain or offset or bridge linearity. The ZSC31010 communicates via IDT's ZACwire™ serial interface to the host computer and is easily mass calibrated in a Windows® environment. Once calibrated, the output pin *Sig*™ can provide selectable 0 to 1 V, rail-to-rail ratiometric analog output, or digital serial output of bridge data with optional temperature data.

Features

- Digital compensation of sensor offset, sensitivity, temperature drift, and non-linearity
- Accommodates differential sensor signal spans, from 3 mV/V to 105 mV/V
- ZACwire™ One-Wire Interface (OWI)
- Internal temperature compensation and detection via bandgap PTAT (proportional to absolute temperature)
- Output options: rail-to-rail analog output voltage, absolute analog voltage, digital ZACwire™ One-Wire Interface (OWI)
- Optional sequential output of both temperature and bridge readings on ZACwire™ digital output
- Fast response time, 1 ms (typical)
- High voltage protection up to 30 V with external JFET
- Chopper-stabilized true differential ADC
- Buffered and chopper-stabilized output DAC

Benefits

- No external trimming components required
- Simple PC-controlled configuration and calibration via ZACwire™ One-Wire Interface
- High accuracy ($\pm 0.1\%$ FSO @ -25 to 85°C; $\pm 0.25\%$ FSO @ -50 to 150°C)
- Single pass calibration – quick and precise
- Suitable for battery-powered applications
- Small SOP8 package

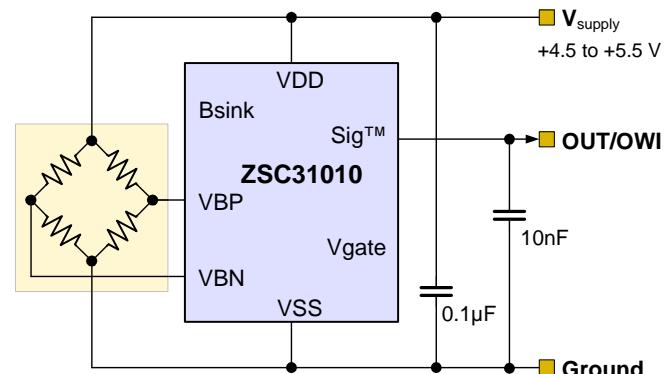
Available Support

- Development Kit available
- Mass Calibration Kit available
- Support for industrial mass calibration available
- Quick circuit customization possible for large production volumes

Physical Characteristics

- Supply voltage 2.7 to 5.5 V, with external JFET 5.5V to 30 V
- Current consumption depending on adjusted sample rate: 0.25 mA to 1 mA
- Wide operational temperature: -50 to +150°C

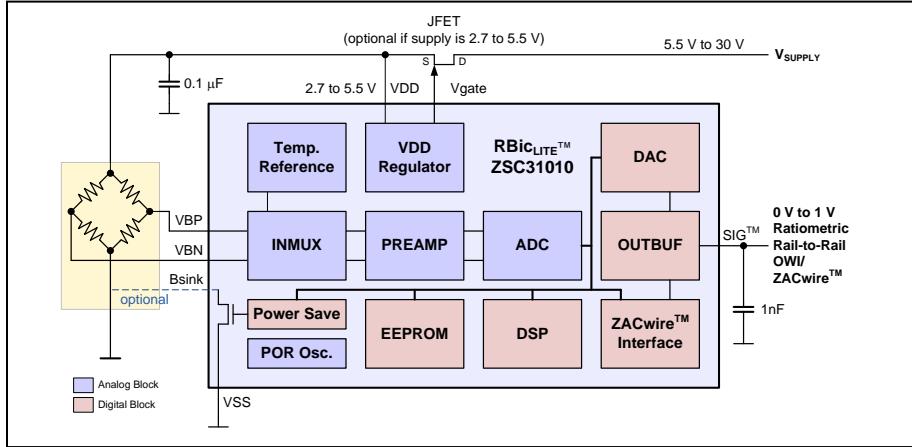
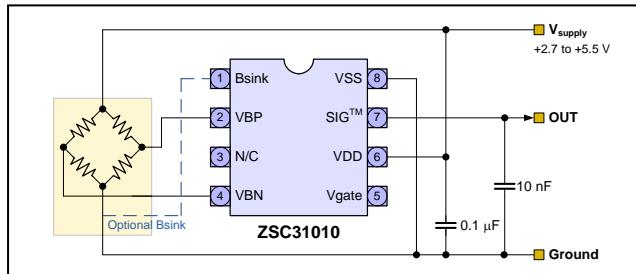
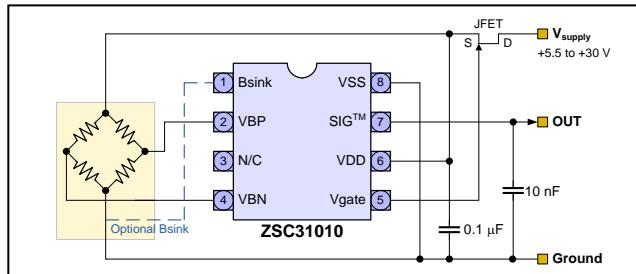
ZSC31010 Application Circuit – Digital Output



ZSC31010 Block Diagram

**Highly Versatile Applications
in Many Markets Including**

- ❖ **Industrial**
- ❖ **Building Automation**
- ❖ **Office Automation**
- ❖ **White Goods**
- ❖ **Automotive**
- ❖ **Portable Devices**
- ❖ **Your Innovative Designs**

**Rail-to-Rail Ratiometric Voltage Output Applications****Absolute Analog Voltage Output Applications****Ordering Examples** (Please see section 11 in the data sheet for additional options.)

Sales Code	Description	Package
ZSC31010CEB	ZSC31010 Die — Temperature range: -50°C to +150°C	Unsawn on Wafer
ZSC31010CEC	ZSC31010 Die — Temperature range: -50°C to +150°C	Sawn on Wafer Frame
ZSC31010CEG1	ZSC31010 SOP8 (150 mil) — Temperature range: -50°C to +150°C	Tube: add "-T" to sales code Reel: add "-R"
ZSC31010KIT	ZSC31010 ZACwire™ SSC Evaluation Kit: Communication Board, SSC Board, Sensor Replacement Board, USB Cable, 5 IC Samples	Kit

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