

Brief Description

The ZSC31150 is a CMOS integrated circuit for highly accurate amplification and sensor-specific correction of bridge sensor signals. Digital compensation of sensor offset, sensitivity, temperature drift, and non-linearity is accomplished via an internal 16-bit RISC microcontroller running a correction algorithm, with calibration coefficients stored in an EEPROM.

The ZSC31150 is adjustable to nearly all bridge sensor types. Measured values are provided at the analog voltage output or at the digital ZACwire™ and I²C interface. The digital interface can be used for a simple PC-controlled calibration procedure in order to program a set of calibration coefficients into an on-chip EEPROM. A specific sensor and a ZSC31150 can be mated digitally: fast, precise, and without the cost overhead associated with trimming by external devices or a laser.

Features

- Digital compensation of sensor offset, sensitivity, temperature drift, and non-linearity
- Adjustable to nearly all bridge sensor types
- Analog gain of up to 420
- Output options: ratiometric analog voltage output (5% to 95% maximum, 12.4-bit resolution) or ZACwire™ (digital one-wire-interface)
- Temperature compensation: internal or external diode, bridge resistance, thermistor
- Sensor biasing by voltage or constant current
- Sample rate: up to 7.8kHz
- High voltage protection up to 33V
- Supply current: max. 5.5mA
- Reverse polarity and short-circuit protection
- Wide operation temperature depending on part number: up to -40°C to +150°C
- Traceability by user-defined EEPROM entries
- Safety and diagnostic functions

Benefits

- No external trimming components required
- Only a few external protection devices needed
- PC-controlled configuration and single pass calibration via I²C or ZACwire™ interface: simple, cost efficient, quick, and precise
- End-of-line calibration via I²C or ZACwire™ interface
- High accuracy (0.25% FSO at -25 to 85°C; 0.5% FSO at -40°C to 125°C)
- Excellent EMC/ESD robustness and AEC-Q100 qualification

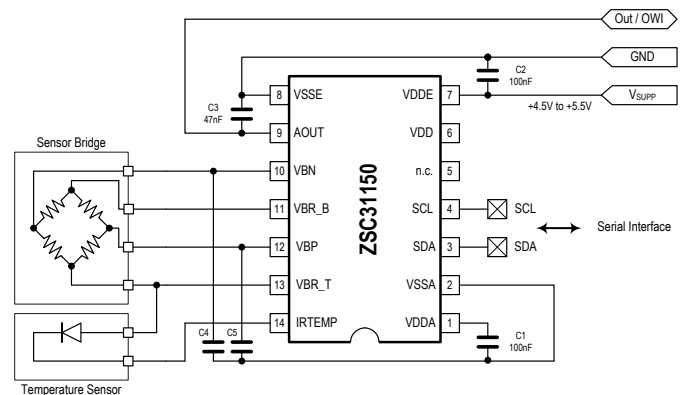
Available Support

- Evaluation Kits
- Application Notes
- Mass Calibration System

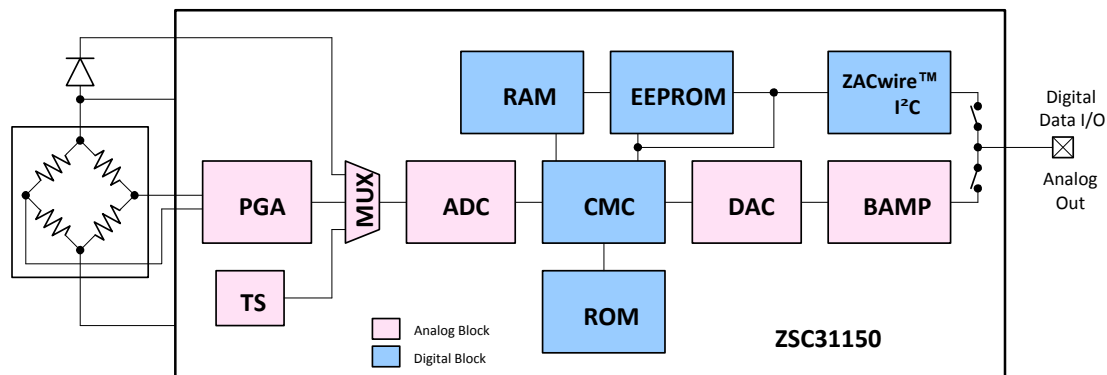
Physical Characteristics

- Supply voltage: 4.5V to 5.5V
- Operation temperature: -40°C to 125°C (-40°C to +150°C extended temperature range)
- Available as 14-DFN (5 × 4 mm; wettable flanks), SSOP14, and die

ZSC31150 Application Circuit



ZSC31150 Block Diagram



Ordering Information

Sales Code	Description	Package
ZSC31150GE	ZSC31150 Die – Temperature range: -40°C to +150°C	Unsawn on Wafer: add “B” to sales code Sawn on Wafer Frame: add “C” Waffle Pack: add “D”
ZSC31150GEG2-R	ZSC31150 14-DFN (5 × 4 mm; wettable flanks) – Temperature range: -40°C to 150°C	Tape and Reel
ZSC31150GAG2-R	ZSC31150 14-DFN (5 × 4 mm; wettable flanks) – Temperature range: -40°C to 125°C	Tape and Reel
ZSC31150GAB	ZSC31150 Die – Temperature range: -40°C to +125°C	Unsawn on Wafer
ZSC31150GAC	ZSC31150 Die – Temperature range: -40°C to +125°C	Sawn on Wafer Frame
ZSC31150GEG1	ZSC31150 14-SSOP – Temperature range: -40°C to +150°C	Tube: add “-T” to sales code Tape & Reel: add “-R”
ZSC31150GLG1	ZSC31150 14-SSOP – Temperature range: -40°C to +150°C (Long life: 5000h @150°C)	
ZSC31150GAG1	ZSC31150 14-SSOP – Temperature range: -40°C to +125°C	
ZSC31150KITV1P2	ZSC31150 SSC Evaluation Kit V1.2: Three interconnecting boards, five ZSC31150 SSOP14 samples, USB cable (software can be downloaded from product page at www.IDT.com/ZSC31150)	
ZSC31150MCSV1P1	Modular Mass Calibration System (MSC) V1.1 for ZSC31150: MCS boards, cable, connectors (software can be downloaded from product page)	

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