

Brief Description

The ZSSC3026 is a sensor signal conditioner (SSC) integrated circuit for high-accuracy amplification and analog-to-digital conversion of a differential input signal. Developed for correction of resistive bridge sensors and optimized for high-resolution altimeter module applications, the ZSSC3026 can perform offset, span, and 1st and 2nd order temperature compensation of the measured signal. It can also provide a corrected temperature output measured with an internal sensor. The corrected measurement values are provided at the digital output pins, which can be configured as I²C™* (≤3.4MHz) or SPI (≤20MHz).

Digital compensation of the signal offset, sensitivity, temperature, and non-linearity is accomplished via an 18-bit internal digital signal processor (DSP) running a correction algorithm. Calibration coefficients are stored on-chip in a highly reliable, non-volatile, multiple-time programmable (MTP) memory. Programming the ZSSC3026 is simple via the serial interface. An internal charge pump provides the programming voltage. The interface is used for the PC-controlled calibration procedure, which programs the calibration coefficients in memory. The digital mating is fast and precise, eliminating the overhead normally associated with trimming external components and multi-pass calibration routines.

Features

- Flexible, programmable analog front-end design; up to 16-bit scalable, charge-balancing two-segment analog-to-digital converter (ADC)
- Fully programmable gain amplifier for optimizing sensor signals: gain range 14 to 72 (linear)
- Internal auto-compensated temperature sensor
- Digital compensation of individual sensor offset; 1st and 2nd order compensation of sensor gain
- Digital compensation of 1st and 2nd order temperature gain and offset drift
- Intelligent power management unit
- Layout customized for die-die bonding with sensor for high-density chip-on-board assembly
- Typical sensor elements can achieve accuracy of better than ±0.10% FSO @ -40 to 85°C

* I²C™ is a registered trademark of NXP.

Benefits

- Excellent for low-voltage and low-power battery applications
- Integrated 18-bit calibration math DSP
- Costs minimized via one-pass calibration
- No external trimming components required
- Highly integrated CMOS design

Physical Characteristics

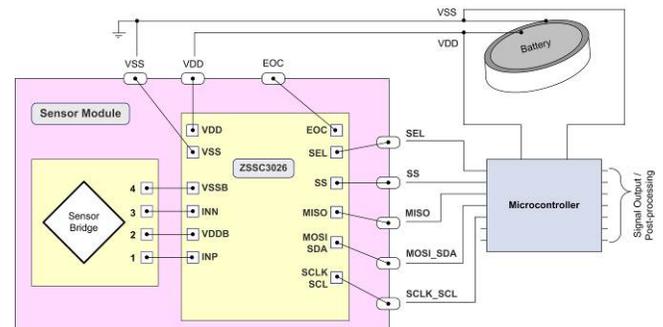
- Supply voltage range: 1.8 to 3.6V
- Current consumption: 900µA (operating mode)
- Sleep State current: 50nA (typical)
- Temperature resolution: <0.003K/LSB
- Operation temperatures depending on part number: -40°C to +85°C
- Small die size
- Delivery options: die for wafer bonding, bumped die for Flip Chip, PQFN24

Typical Applications

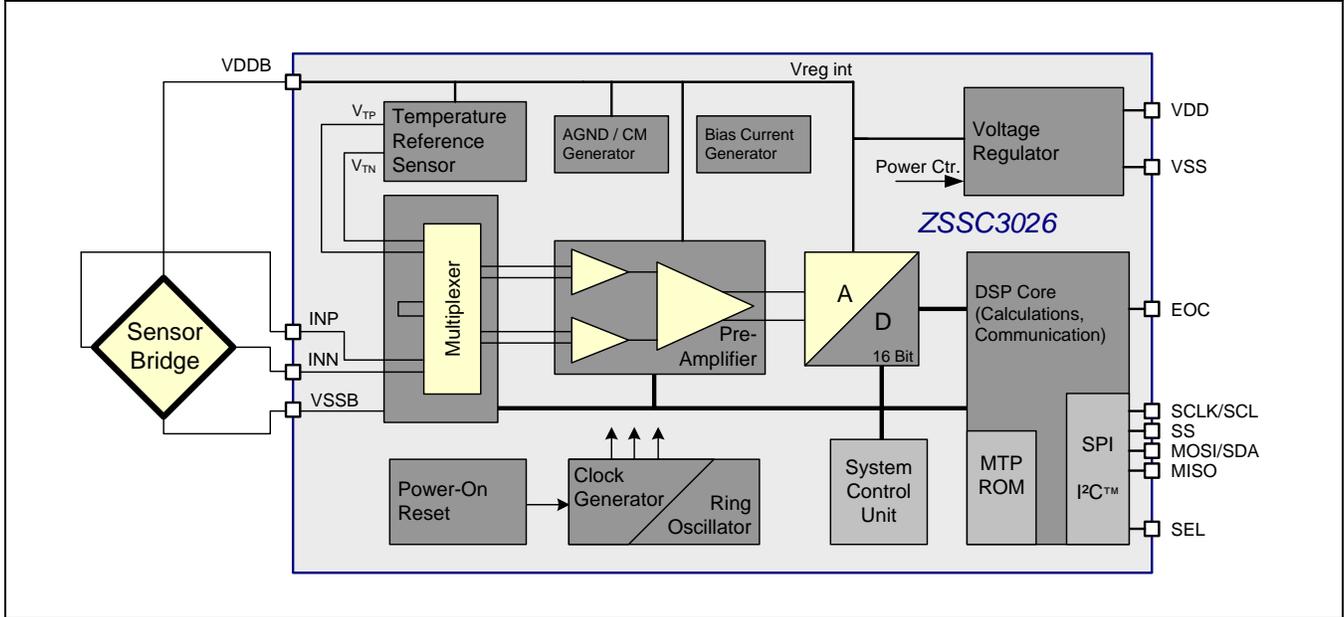
The ZSSC3026 is designed for operation in calibrated resistive (e.g., pressure) sensor modules:

- Barometric altitude measurement for portable navigation
- Altitude measurement for emergency call systems and car navigation
- Inside hard disk pressure measurement
- Weather forecast
- Fan control

ZSSC3026 Application Example



ZSSC3026 Block Diagram



Ordering Information (Please contact IDT Sales for additional options)

| Sales Code | Description | Package |
|--------------|--|-----------------------|
| ZSSC3026CC1B | ZSSC3026 Die — temperature range: -40°C to +85 °C, tested | Unsaawn wafer (304µm) |
| ZSSC3026CI1B | ZSSC3026 Die — temperature range: -40°C to +85 °C; extended qualification: tested, 10 years MTP-data retention, HTOL tested | Unsaawn wafer (304µm) |
| ZSSC3026KIT | Evaluation Kit for ZSSC30x6 Product Family; two circuit boards, cable, and 1 sample (Evaluation Software is downloadable from www.IDT.com/ZSSC3026) | Kit |

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